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Editorial Office
The Japan Institute for Labour Policy and Training
International Research Exchange Section
8-23, Kamishakujii 4-chome, Nerima-ku, Tokyo 177-8502, Japan
TEL: +81-3-5903-6274 FAX: +81-3-3594-1113
For inquiries and feedback: j-emm@jil.go.jp

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CONTENTS

Key topic

The Impact of COVID-19 on Employment and Labor

MHLW's White Paper on the Labor Economy 2021

On July 16, 2021, the Ministry of Health, Labour and Welfare (MHLW) published the White Paper on the Labor Economy 2021 which presents analysis under the heading "The Impact of COVID-19 on Employment and Labor." As analysis of 2020 was postponed in light of the extensive impact of the COVID-19 pandemic on the labor economy and other such factors, this paper provides analysis of the labor economy over a two-year period—namely, 2019 and 2020. Provisional calculations set out in the White Paper estimate that the Employment Adjustment Subsidy (*koyō chōsei joseikin*; hereafter "EAS") and the related Emergency Subsidy for Job Security (*kinkyū koyō antei joseikin*) have curbed the total unemployment rate by around 2.6 percentage points. The paper assessed that the support provided by the EAS and Emergency Subsidy for Job Security and other such employment measures (hereafter "EAS, etc.") has played a significant role in protecting workers' employment and livelihoods. On the other hand, the White Paper notes that the huge payouts are beginning to place a strain on finance of the employment insurance and highlights the need to address how such burdens should be handled. Looking at the implementation of telework, which has become more prevalent in the COVID-19 crisis, the White Paper indicates that enterprises and workers who had already been implementing telework prior to the onset of the pandemic—as opposed to those who first implemented telework during the initial declaration of a state of emergency from April to May, 2020—have a tendency for communication to be pursued more effectively and show higher percentages continuing to implement telework after the initial state of emergency. It expressed anticipation that telework will take root as a style of working suited to the "new normal" and "new lifestyles" that develop in and after the COVID-19 pandemic.

Trends by industry differ from those of the 2008 financial crisis

The White Paper starts by analyzing the impacts of COVID-19 on employment and labor and other such aspects. Looking at the increase or decrease (difference with the same month of the previous year) in numbers of employed persons by industry, the analysis shows continuing steady increases in the numbers of employed persons in industries' divisions such as the information and communications, medical, healthcare and welfare. In contrast, in industries such as accommodations, eating and drinking services, wholesale and retail trade, living-related and personal services and amusement services, the breadth of decline was significant.

Looking at increase or decrease (difference with the same month of the previous year) in numbers of employed persons by gender and by employment type, while 2020 saw a rise in the number of female regular employees, the numbers of non-regular employees—both male and female—have been declining, with a particularly considerable decrease in the numbers of female non-regular employees. In reference to these trends, the White Paper notes "differing aspects to those at the time of the 2008 financial crisis."

Prominent impact on female non-regular employees

Looking at the rise and fall in numbers of non-regular employees by industries, there were significant declines in the numbers of female non-regular employees in accommodations, eating and drinking services, manufacturing, wholesale and retail trade, living-related and personal services and amusement services, and in the numbers of male non-regular employees in manufacturing. Looking at trends (differences with the same month of the previous year) in the numbers of unemployed persons (persons aged 15 or over without work who are seeking yet unable to find work) and non-labor force population by gender and relationship with the head of household, in the case of men, there was a marked rise in the number of unemployed persons among heads of household. In the case of women, among spouses of heads of household and heads of household there were comparatively significant increases in the non-labor force population from April 2020 onward and in the number of unemployed persons in the second half of 2020.

Considering these trends, the White Paper determined that the employment and labor situation in 2020 was marked by a considerable impact on the labor market, particularly around the period in which a state of emergency was declared. At the same time, it suggested that the increases in the number of unemployed people and the unemployment rate in December 2020 were merely moderate in comparison with those at the time of the 2008 financial crisis, and this was to some extent a result of enterprises' efforts to maintain employment—which are also related to ongoing personnel shortages that preexisted the pandemic—and the effects of related policies and other such factors. It also went on to note that given the considerable impact on the employment of non-regular workers—in particular, part-time work and side jobs (*arubaito*) pursued largely by women and students—the state of employment and labor in the pandemic is highly unpredictable and will continue to require close observation in the future.

Higher Payments Amount of the EAS, etc. than 2008 financial crisis levels

In the COVID-19 crisis, efforts to support maintaining and continuing employment have entailed the adoption of extensive special measures in the emergency response period (April 1, 2020, onward), which include raising the upper limit on the daily subsidy amounts and the subsidy rates of the EAS, and the implementation of the Emergency Subsidy for Job Security to subsidize compensation for workers not covered under employment insurance.

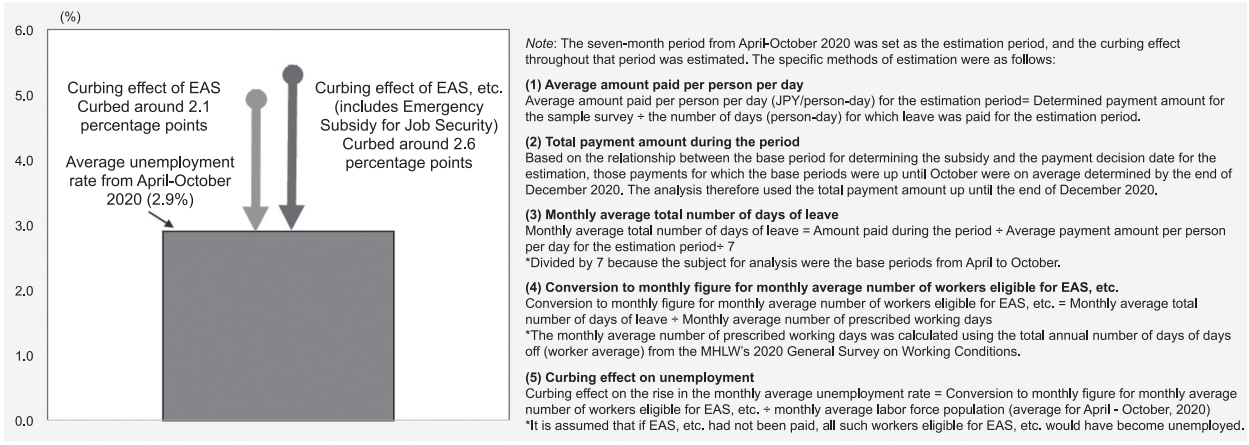
Looking at the monthly trends in the amount of EAS, etc. that was determined to be paid, both the highest monthly amount and the pace of increase in the determined payment amount exceed those in the 2008 financial crisis. At its peak in August 2020, the determined payment amount reached around 570 billion JPY, and payments have since continued at a higher level than those in the 2008 financial crisis.

Necessity of addressing the state of the fiscal burden

The White Paper estimates the curbing effect of the EAS, etc. on the unemployment rate. These estimates show that the payment of the EAS, etc. (which, while calculated according to certain assumptions that preclude a simple comparison due to the necessity to maintain a considerable margin) is projected to have curbed the unemployment rate between April and October 2020 by 2.6 percentage points (Figure 1).

The White Paper notes that provisional calculations estimate that the curbing effect of the EAS on the unemployment rate in the 2008 financial crisis was, even at its highest level, around one percentage point. It surmises that in the current crisis the support provided to enterprises in the form of special measures for the EAS has played a greater role in maintaining employment than that provided in the 2008 financial crisis.

On the other hand, the huge EAS payouts are beginning to place strain upon the finance of the employment insurance, due to the marked decline in the balance of the employment stabilization fund,



Sources: Estimates by the Office of the MHLW Director-General for General Policy and Evaluation based on data published by the MHLW on the actual payments of EAS, etc., a sample survey conducted by the MHLW's Employment Security Bureau, the MHLW's General Survey on Working Conditions, and the Labor Force Survey (basic tabulation) by the Statistics Bureau of the Ministry of Internal Affairs and Communications.

Figure 1. Curbing effect of EAS, etc. on the unemployment rate

which funds the EAS, and the balance of the reserve fund for unemployment benefits and similar benefits, which is being loaned to the employment stabilization fund to finance the EAS. The White Paper also noted the impending need to address how these burdens are handled in the future.

Emotional burdens prominent in the COVID-19 crisis

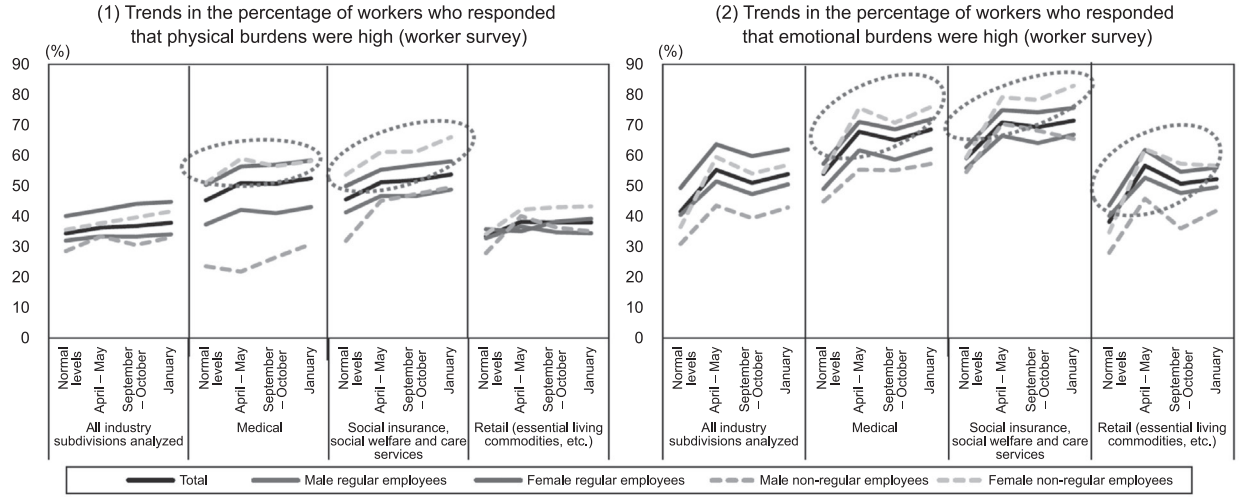
Drawing on the JILPT's "Survey on the Actual Conditions of Working in the COVID-19 Pandemic (Worker Survey)," the White Paper also pursues analysis regarding workers who have been expected to continue working during the pandemic, with a focus on those in the medical, care services, and retail industries.

Looking by industry chronologically at the percentages of workers who responded that they experienced high physical and emotional burdens, in the medical and the social insurance, social welfare and care services industries, where both physical and emotional burdens were typically (that is, prior to the onset of the pandemic) at higher levels in comparison with other industries, there were increases in April-May 2020 and in January 2021. Looking at emotional burdens, the increases are prominent in all of these industries, such as the increase in April-May 2020 in the retail (essential living commodities, etc.) industry subdivision. It should also be noted that the percentages who responded that the burdens were high, with regard to both physical and emotional burdens, are higher among women than among men for both regular employees and non-regular employees (Figure 2).

Infection countermeasures contribute to rise in job satisfaction

Looking at the relationship between job satisfaction and the measures pursued by workplaces to tackle the spread of infection, in the event that "compliance with industry-based guidelines," "increasing and enhancing the organization of employees," and "accommodating shifts according to requests from individuals" have been implemented on an ongoing basis, the percentages of workers whose "sense of satisfaction gained through work" increased are generally higher in comparison with cases in which such measures were not implemented at any point.

It is conceivable that due to the prolonged impact of the COVID-19 pandemic, the workplaces are facing continuously severe conditions. The White Paper expects enterprises and institutions to ensure workers to be able to maintain the motivation



Sources: The Office of the MHLW Director-General for General Policy and Evaluation's own tabulation based on the JILPT "Survey on the Actual Conditions of Working in the COVID-19 Pandemic (Worker Survey)" (2021).
Notes: 1. Figure (1) shows the sum of those who responded "extremely high" and those who responded "high" in response to the question "What was the extent of the physical burdens of your work in each period?"
2. Figure (2) shows the sum of those who responded "extremely high" and those who responded "high" in response to the question "What was the extent of the emotional burdens of your work in each period?"
3. In Figures (1) and (2), "typical levels" refers to those in and before January 2020, "April to May" refers to April to May 2020, "September to October" refers to September to October 2020, and "January" refers to January 2021.

Figure 2. Trends in the percentages of workers who responded that the emotional and physical burdens were high

with which they approach their work even in such conditions. Given the abovementioned finding in the relationship between job satisfaction and the infection prevention measures pursued by workplaces, the White Paper indicates that workplace measures to prevent infection could ensure workers' higher satisfaction and motivation to work when implemented as comprehensive measures for improving their working environment such as flexible working styles and their working conditions such as appropriate remuneration. The White Paper suggested that the enterprises and institutions will be expected to ensure that communication is pursued between workers and management and in doing so engage in measures that satisfy workers as far as possible.

Anticipated spread of telework

The White Paper summarizes that it anticipates that telework, which has become more widespread as a result of the COVID-19 pandemic, will take root in Japan as a working style suited to the "new normal" and "new lifestyles" that develop in and after the COVID-19 pandemic, and as a new working style that can provide any worker with the chance to raise their productivity through an effective approach to when and where they work.

The White Paper draws on the JILPT Panel Survey on the Impact of COVID-19 on Work and Daily Life (3rd wave)[1] and the Survey on the Impact of COVID-19 on Enterprise Management (February 2021 Survey)[2] to analyze workers who have adopted telework as means of pursuing their work. Looking at the levels of enterprises and workers continuing telework by timing at which the telework began, the analysis shows that the percentages continuing telework are higher among those enterprises and workers who were implementing telework prior to the COVID-19 pandemic, in comparison with those enterprises and workers who began teleworking during the pandemic.

Looking at telework in terms of indicators of productivity and other such aspects based on workers' responses (workers were asked to gauge telework between 0 and 200, if working in an office

is 100), while average values for the "productivity and efficiency" and "fulfillment and satisfaction" of telework were lower than working in an office (100), those workers who had experience of telework prior to the pandemic, in comparison with workers who were teleworking for the first time during the pandemic, tended to have a higher average value for the indicators and lower breadth of decline in the indicators. Looking at the reasons for ceasing to implement telework—excluding factors such as the nature of the work and impact of infection or other such factors beyond the control of enterprises and workers—there were issues that could be tackled through personnel management measures, such as addressing the ways in which work is conducted when teleworking and developing environments for telework. This trend is high among the percentage of workers who responded that they began teleworking during the declaration of a state of national emergency in April to May 2020. The enterprise survey also shows high percentages of enterprises who see said points as issues to address.

The percentages of workers who responded that they felt that when teleworking, work can be carried out with "clarity regarding scope of duties and deadlines," "freedom to make one's own decisions about one's work," "clarity regarding evaluation criteria" were all higher among workers who had experience of telework prior to the pandemic, in comparison with those who first began teleworking during the pandemic. Those workers who agreed that the above aspects were possible in telework tend to have a slightly higher average value for the indicator of "fulfillment and satisfaction," when compared with those workers who did not.

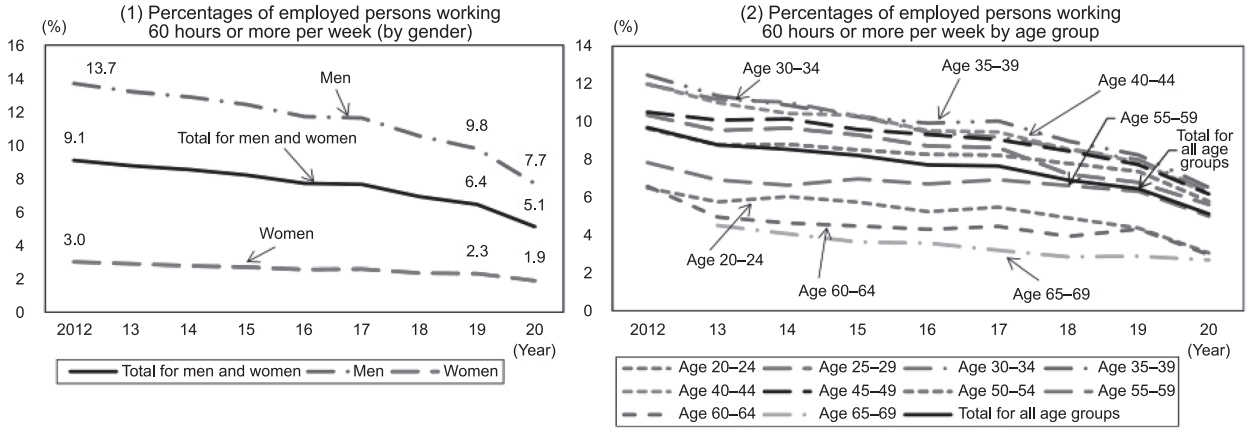
Likewise, the percentages of workers who, when asked about the state of development of the environment in which they telework, responded that they are "well-equipped for teleworking" are higher among those workers who had experience of teleworking prior to the pandemic, in comparison with to those who first began teleworking during the pandemic. Workers who selected the above response have a higher average value for the indicator of "fulfillment and satisfaction," when compared with those workers who did not.

Based on these analysis results, the White Paper notes that workers who were teleworking prior to the pandemic have better conditions in terms of productivity and efficiency when teleworking, work-life balance, and the fulfillment and satisfaction they enjoy through work, and thereby have a greater sense of the benefits of telework. Addressing the reasons behind this greater sense of the merits of telework, the paper suggests that while it is necessary to account for the fact that enterprises that had implemented telework prior to the onset of the pandemic may be able to pursue telework with greater ease due to the nature of their business and other such factors, it may reflect the product of the efforts of such workers to pursue telework effectively as they worked to overcome various issues in their experiences of telework.

Noting that there are cases in which telework may be possible even in industries and for occupation types for which it would at first glance be considered difficult to pursue, the White Paper suggests that "in some cases it may be useful to fundamentally readdress the work content, rather than necessarily selecting the work that will be pursued in teleworking on the assumption that a worker will continue to pursue their existing duties." The White Paper also went on to note the importance of management measures to allow telework to be implemented effectively, such as ensuring that workers are able to pursue sufficient work-related communication while teleworking, defining in advance the criteria upon which work will be evaluated, clearly informing workers about the scope of their duties and deadlines, and allowing workers the freedom to make judgements regarding their own work.

Decline in working hours prompted by work style reform

Aside from addressing the impact of the COVID-19 pandemic, the White Paper also analyzes the progress of work style reform. With the provisions introduced under the Work Style Reform Act, such as the introduction of an upper limit on overtime



Source: Compiled by the Office of the MHLW Director-General for General Policy and Evaluation based on the Labor Force Survey (basic tabulation) by the Statistics Bureau of the Ministry of Internal Affairs and Communications.
Notes: 1. The figure shows the percentage of people working 60 hours or more per week within the total number of people *not* employed in agriculture and forestry (excluding people on leave).
2. Percentage of 2012 by age group ((2) above) is calculated with the number of workers, instead of the number of employees.

Figure 3. Percentages of employed persons working 60 hours or more per week

work (enforced in April 2019 for major enterprises, and in April 2020 for small and medium-sized enterprises) and ensuring that workers take five days of annual paid leave per year (enforced in April 2019), working hours declined in 2020 across all age groups. The percentages of employed people working 60 hours or more per week are also decreasing, particularly among men (Figure 3). Meanwhile, the rate of taking annual paid leave rose significantly in 2019 across all sizes of enterprise.

Looking at wages, due to the enforcement of the Working-Style Reform Act's provision regarding equal pay for equal work (that is, the eradication of unreasonable differences in pay between employment types; enforced in April 2020 for major enterprises and April 2021 for small and medium-sized enterprises) and other such factors, bonuses and other allowances paid to part-time workers have risen despite the impact of the pandemic in 2020.

1. For summary of the survey results, see https://www.jil.go.jp/english/special/covid-19/survey/documents/20210118.pdf.
2. For summary of the survey results, see https://www.jil.go.jp/english/special/covid-19/survey/documents/20210430.pdf.

Article

Remote Work and Job Satisfaction that Depends on Personality Traits: Evidence from Japan

TAKAMI Tomohiro

I. Introduction

When remote work (working from home, etc.) is implemented, workers' work styles change from working in close communication with colleagues in the office to working independently away from the office, such as at home. It is thought that there is a large difference in whether or not this change of work style is accepted favorably by workers themselves depending on the personality traits of the individual. This paper considers that there are individual differences in whether or not remote work can achieve job satisfaction from the perspective of workers' personality traits.[1]

With the spread of COVID-19 infection, the implementation of remote work has expanded rapidly in many countries. In Japan, the use of remote work was extremely limited before the COVID-19 pandemic for various corporate reasons concerning information security or difficulty in managing working hours. For that reason, in most cases, it existed as a system applied to only employees with family responsibilities such as childcare and elderly care. However, with the first wave of COVID-19 infection and the first state of emergency declaration in April 2020, the implementation of remote work expanded significantly from the viewpoint of reducing the number of commuters to prevent the spread of infection.[2] After the declaration was lifted at the end of May that year, there were quite a few cases where remote work was not continued and people returned to their offices even though the spread of infection had not converged.[3]

During the shift from commuting to the office to remote work under the pandemic, workers pointed out various issues such as difficulty in working from home due to insufficient ICT equipment and difficulty in communicating with superiors and colleagues.[4] For companies, in order to continue remote work measures even after the pandemic, it is necessary to modify work content and procedures so that work-from-home feasibility is enhanced and to improve the productivity of remote work.

Workers' preference for remote work is an important factor in continuing remote working after the pandemic. Are workers satisfied with the work style change under the pandemic? This paper considers this point using the index of job satisfaction. It is presumed that the relationship between remote work and job satisfaction is not so simple. While some have said that they want to continue remote work even after the pandemic is over, others have said that they cannot maintain mental well-being in remote work and want to return to commuting to the office.[5] What can be seen from this current situation is that there is a clear division between those who prefer remote work and those who do not. The following section examines individual differences in whether or not remote work can provide job satisfaction in line with the "Big Five" personality traits.

II. Related literature

This section reviews related literature on the impact of personality traits on work, especially on

job satisfaction. There is evidence in psychology that the human personality can be explained by five factor model of personality called the "Big Five" (Goldberg 1990). The five personality dimensions are "extraversion," "agreeableness," "conscientiousness," "neuroticism," and "openness to experience." Based on Barrick et al. (2001), the content of these five personality dimensions can be defined as follows. "Extraversion" consists of sociability, dominance, ambition, positive emotionality and excitement-seeking. Cooperation, trustfulness, compliance and affability define "agreeableness". "Conscientiousness" is associated with dependability, achievement striving, and planfulness. "Neuroticism" reflects anxiety, hostility, depression and personal insecurity.[6] Intellectance, creativity, unconventionality and broad-mindedness define "openness to experience".

It has been pointed out that personality traits are strongly associated with various work-related outcomes, and evidence has been gained that they are associated with occupational success such as high wages and promotions. Based on a meta-analysis, Barrick et al. (2001) examine the effects of personality traits on job performance with various indicators. The results show that "conscientiousness" has an overall positive impact. Their study also shows that personalities such as emotional stability, which is the opposite of "neuroticism," and "agreeableness" have a positive effect on teamwork.[7]

At the same time, the relationship between personality traits and job satisfaction has been discussed in previous studies. Although job satisfaction depends largely on working conditions such as wages and working hours, it also reflects the degree of sufficiency of non-monetary compensation. Based on a meta-analysis, Judge et al. (2002) argue that, with respect to job satisfaction, "neuroticism" has a negative correlation and "extraversion" has a positive correlation. It should be noted that the effect of personality traits may vary depending on the person's background and the surrounding environment. Bui (2017) examines differences by gender and age group. Regarding the four characteristics other than "extraversion," the factors that affect job satisfaction differ depending on gender and age group. He argues that the relationship between personality traits and job satisfaction is complex.

Additionally, personality traits related to occupational success and well-being may differ depending on the cultural background and working environment. For example, Zhai et al. (2013) discuss the characteristics of Chinese society as including high power distance and high collectivism, with the analysis result that "extraversion" is positively related to job satisfaction in China, unlike in the West. Lee and Ohtake (2018) show that in Japan, unlike the United States, "agreeableness" is associated with higher wages in men. They argue that "agreeableness" brings occupational success because Japan is a groupist working environment that requires teamwork. Templer (2012) also states that in a tight and collectivistic Asian society, "agreeableness" is positively related to job satisfaction. Concerning this point, the advantages/disadvantages of such personality traits may change if the teamwork element becomes less important as remote work spreads.

"Openness to experience" is characterized by intellectance and unconventionality, but is also referred to as a "double-edged sword" (Bui 2017). Specifically, in conventional workplace culture, it is sometimes said that workers with that personality tend to change jobs and have difficulty in obtaining satisfaction in their occupational career.[8] However, as the working environment changes due to the implementation of remote work, the relationship between workplace colleagues and individuals may change, and such a personality may not be disadvantaged.

From the previous study mentioned above, it can be considered that whether or not workers are satisfied with remote work depends on their individual personality. A notable change in remote work is the shift from a style of working closely with colleagues in the office to a style in which each person works independently away from the office. Under these changes in the working environment, there are fewer chances for workers to be able to sense the fulfillment and motivation that they

usually gain from close relationships with colleagues as before. Conversely, remote work may bring psychological benefits to those who prefer to work independently or who are prone to interpersonal stress.

Furthermore, workers who are highly adaptable to new work styles may be able to discover the meaning of work in new ways. This may be true even for those who are not familiar with the traditional corporate culture. The characteristics of those who become satisfied in a remote work situation may differ from those in a conventional way of working. Based on these research questions, the following section examines the relationship between personality traits and job satisfaction.

III. Data and descriptive statistics

The dataset used in this paper is the "JILPT Panel Survey on the Impact of COVID-19 on Work and Daily Life" conducted by JILPT in December 2020.[9] The target sample is employees who have been employed in the same company since April 1, 2020.

Whether or not remote work is being performed as of December 2020 is identified by the survey result. Job satisfaction is grasped on a five-point scale in the questionnaire, and is used as a score. In the same survey, personality traits are grasped in 10 items based on the TIPI-J.[10] Table 1 shows the descriptive statistics of the variables used in this paper, including the control variables.

The correlation matrix between personality traits and job satisfaction is shown in Table 2. Job satisfaction has a positive correlation with "extraversion," "agreeableness," "conscientiousness," and "openness to experience," and a negative correlation with "neuroticism."

The correlation between personality traits and job satisfaction tends to be different for those who perform remote work and those who do not. Looking at the correlation coefficient by whether or not remote work is performed (Table 3), in those who do not perform remote work, job satisfaction has a positive correlation with "extraversion," "agreeableness," "conscientiousness," and "openness to experience," and a negative correlation with "neuroticism." On the other hand, for those who perform remote work, job satisfaction has a positive correlation with "conscientiousness" and "openness to experience," and a negative correlation with "neuroticism." No correlation with "extraversion" and "agreeableness" is confirmed. There is also a difference in the value of the correlation coefficient, and it is possible that the relationship between personality traits and job satisfaction may differ depending on whether or not remote work is performed.[11] Since the correlation between each personality trait is confirmed from Tables 2, the next section examines what kind of personality traits are directly related to job satisfaction in the regression analysis.

IV. Estimation results

Following the basic statistics, this section estimates the factors that determine job satisfaction. The purpose of the estimation is to examine the possibility that the relationship between personality traits and job satisfaction differs between remote workers and non-remote workers.

The estimation method is an ordinal logistic regression with job satisfaction as of December 2020 as the dependent variable. By inputting job satisfaction before COVID-19 as a control variable, we examine what kind of person's job satisfaction is high as of December 2020 among those who have the same level of job satisfaction as that before the pandemic.

The explanatory variables of interest are personality traits, the implementation of remote work, and the interaction terms between the two.[12] By inputting the interaction terms, it is possible to identify personality traits related to job satisfaction, especially in remote work. In addition, the analytical model controls change in income and working hours under COVID-19. Therefore, apart from these changes in working conditions, the determinants of job satisfaction can be interpreted from the perspective of non-monetary compensation, such as whether the workers feel meaningful as a result of their work.

There are three steps in this analysis. In analyses

Table 1. Descriptive statistics

	(1) Full sample		(2) Remote workers	
	Mean	S.D.	Mean	S.D.
Age	44.667	10.757	45.095	10.592
Female	0.438	0.496	0.289	0.454
Marrital status	0.536	0.499	0.619	0.486
University graduates	0.462	0.499	0.741	0.438
Non-regular employee	0.311	0.463	0.146	0.354
Industry				
Construction	0.055	0.229	0.036	0.185
Manufacturing	0.238	0.426	0.310	0.463
Electricity, gas, heat supply and water	0.014	0.118	0.012	0.108
Information and communications	0.056	0.230	0.198	0.399
Transport	0.063	0.243	0.028	0.164
Wholesale and retail trade	0.136	0.343	0.089	0.285
Finance and insurance, and Real estate	0.234	0.423	0.144	0.352
Accommodations, eating and drinking services	0.025	0.156	0.008	0.089
Medical, health care and welfare	0.133	0.340	0.024	0.152
Education, learning support	0.032	0.176	0.036	0.185
Services (not elsewhere classified)	0.129	0.335	0.105	0.307
Others	0.202	0.401	0.075	0.264
Occupation				
Administrative and managerial workers	0.100	0.300	0.200	0.400
Professional and engineering workers	0.200	0.400	0.302	0.460
Clerical workers	0.255	0.436	0.281	0.450
Sales workers	0.144	0.351	0.134	0.341
Service workers	0.094	0.292	0.040	0.195
Production/skilled workers	0.171	0.376	0.024	0.152
Others	0.037	0.188	0.020	0.139
Size of enterprise				
29 or fewer employees	0.195	0.397	0.101	0.301
30–299 employees	0.311	0.463	0.223	0.417
300–999 employees	0.132	0.339	0.166	0.372
1000 or more employees	0.279	0.449	0.478	0.500
Do not know	0.082	0.275	0.032	0.175
Region of residence				
Tokyo metropolitan area (4 prefectures)	0.309	0.462	0.502	0.500
Kansai (3 prefectures)	0.134	0.341	0.138	0.346
Other regions	0.557	0.497	0.360	0.480
Years of service	11.7	9.6	14.4	10.7
Annual income in 2019 (10 thousand JPY)[1)]	401.4	285.4	608.9	337.5
Working hours before COVID-19	39.7	12.3	42.5	9.4
Job satisfaction before COVID-19	3.185	0.951	3.253	0.993
Decrease in monthly income	0.259	0.438	0.294	0.456
Change in working hours				
Decreased working hours	0.334	0.472	0.375	0.485
Increased working hours	0.217	0.412	0.221	0.416
Implementation of remote work	0.175	0.380	1.000	0.000
“Big Five” personality traits				
Extraversion	7.379	2.502	7.798	2.388
Agreeableness	9.342	2.003	9.275	2.082
Conscientiousness	7.998	2.236	8.381	2.287
Neuroticism	8.085	2.198	7.662	2.374
Openness to experience	7.504	2.124	7.929	2.179
Job satisfaction (in December 2020)	2.952	0.977	3.065	0.988
Observations	2,885		506	

Note: 1. The min and max of annual income in 2019 (10 thousand JPY) are 0 and 2,250, respectively.

Table 2. Correlation matrix

		Mean	S.D.	1	2	3	4	5
1	Extraversion	7.379	2.502					
2	Agreeableness	9.343	2.003	-.081**				
3	Conscientiousness	7.998	2.236	.257**	.198**			
4	Neuroticism	8.085	2.198	-.235**	-.226**	-.369**		
5	Openness to experience	7.504	2.124	.409**	-.037*	.262**	-.219**	
6	Job satisfaction	2.952	0.977	.122**	.076**	.084**	-.119**	.079**

Note: **p<.01; *p<.05. N=2,885.

Table 3. Correlation coefficient between personality traits and job satisfaction: by remote work implementation

	Correlation with job satisfaction	
	Non-remote workers	Remote workers
Extraversion	.126**	.081
Agreeableness	.083**	.048
Conscientiousness	.075**	.104*
Neuroticism	-.111**	-.130**
Openness to experience	.059**	.145**

Note: **p<.01; *p<.05.

(1) and (2), full samples including those who do not perform remote work are analyzed. First, in analysis (1), we look separately at the effects on job satisfaction of personality traits and remote work. Subsequently, in analysis (2), the interaction terms between the personality traits and remote work are input, and what kind of personality traits are likely to increase/decrease the satisfaction level in the remote work situation is examined. Furthermore, for the purpose of complementing analysis (2), analysis (3) is conducted only for remote workers.

The estimation results are shown in Table 4. First, in analysis (1) of the full samples, the estimated values of decreased monthly income and increased working hours are negative and significant, and it is presumed that job satisfaction is low in such working conditions. These results indicate that the worsening of working conditions under COVID-19 affects the decrease of job satisfaction. Regarding personality traits, the estimated value of "neuroticism" is negative and significant, indicating that the higher the "neuroticism," the lower the job satisfaction, regardless of whether a worker performs remote working. In addition, the estimated value of performing remote work is positive and significant. It indicates that the remote workers tend to have higher job satisfaction.[13]

In analysis (2), the interaction terms of personality traits and remote work are additionally input. First, looking at the main effects of personality traits, the estimated value of "neuroticism" is negative and significant, and the estimated value of "extraversion" is positive and significant. These results show that, in cases other than remote work, the higher the "extraversion," the higher the job satisfaction, and the higher the "neuroticism," the lower the job satisfaction.

The interaction term results show the personality traits that are particularly related to job satisfaction in a remote work situation. Estimates of interaction terms such as "extraversion × remote work" and "agreeableness × remote work" are negative, and estimate value of "openness to experience × remote work" is positive. First, in cases other than remote work, the higher the "extraversion," the higher the job satisfaction. However, in remote work, "extraversion" is considered to be unrelated to job satisfaction.[14] The sociable and talkative personality of preferring to be with others increases job satisfaction in situations where work is carried out

Table 4. Estimates for job satisfaction

	(1)		(2)		(3)	
Explained variable	Job satisfaction					
Target sample	Full sample				Remote workers	
Model	Model 1		Model 2			
	B	S.E.	B	S.E.	B	S.E.
Age	-.004	.004	-.004	.004	-.008	.011
Female	.053	.093	.046	.093	.039	.232
Decrease in monthly income	-1.053	.087 **	-1.057	.087 **	-.872	.204 **
Changes in working hours						
Decrease in working hours	-.119	.086	-.118	.086	-.128	.216
Increase in working hours	-.240	.094 *	-.250	.095 **	-.570	.233 *
Personality traits						
Extraversion	.029	.017 †	.045	.018 *	-.036	.041
Agreeableness	-.011	.019	.007	.021	-.110	.045 *
Conscientiousness	-.005	.018	-.010	.020	.033	.046
Neuroticism	-.049	.018 **	-.043	.020 *	-.077	.042 †
Openness to experience	.018	.019	.001	.021	.116	.045 **
Implementation of remote work	.222	.108 *	1.087	.874		
Interaction terms						
Extraversion × Remote work			-.082	.043 †		
Agreeableness × Remote work			-.105	.048 *		
Conscientiousness × Remote work			.029	.047		
Neuroticism × Remote work			-.035	.046		
Openness to experience × Remote work			.099	.048 *		
χ^2	974.952		984.873		175.492	
-2 Log-likelihood	6899.96		6890.039		1217.672	
Nagelkerke R2	0.307		0.309		0.313	
Observations	2,885		2,885		506	

Notes: 1. ***p*<.01; **p*<.05; †*p*<.10.
2. As control variables, marital status, educational background, type of employment, industry, occupation, size of enterprise, region of residence, years of service, annual income in 2019, working hours before COVID-19, and job satisfaction before COVID-19 are controlled.

while communicating closely in the office. However, in remote work, it is unlikely that such a personality will obtain non-monetary rewards.[15] Next, regarding "agreeableness," in the case of remote work, it acts in the direction of lowering job satisfaction. "Agreeableness," which puts importance on intimate interpersonal relationships, is considered to be less psychologically rewarding in remote work, where teamwork elements are reduced due to clarification of division of duties. Finally, it is shown that individuals with higher "openness to experience" are more likely to obtain high job satisfaction through remote work, which supports the interpretation that a person with this personality is highly receptive to the new working environment. Additionally, in a remote work environment, curiosity and free thinking may lead to the discovery of new meanings of work. Furthermore, in analysis (2), it is noted that the standard error of the remote work variable becomes large and the coefficient becomes nonsignificant. In other words, the effect of remote work on job satisfaction largely depends on personality traits, and it can be seen that the effect cannot be accurately measured if the personality traits of workers are ignored.

The above points are also confirmed in the supplementary analysis (3) targeting only remote workers. It is confirmed that "agreeableness" has a negative relationship with job satisfaction and "openness to experience" has a positive relationship

with job satisfaction in remote workers. It can be said that this result is consistent with the estimation result of analysis (2). As mentioned above, it has been shown that whether job satisfaction can or cannot be obtained in remote work greatly depends on personality traits.[16]

V. Conclusion

The expansion of remote work has brought about a shift in work style from working while communicating closely in the office to working independently away from the office, such as at home. It is generally said that the reduction of face-to-face communication with superiors and colleagues due to a remote work situation leads to a feeling of isolation and loneliness of employees, and companies are struggling to take measures such as providing opportunities for online chat. However, as seen in this paper, the implications of remote work differ greatly depending on the personality of each worker, and it is not desirable to have a uniform response regarding employee communication. This is a point that requires meticulous workplace management.

It is presumed that changes in work style due to remote work bring about a reduction of the meaning of work (psychological rewards obtained from work) for workers who value close relationships with others such as socializing and intimacy. On the other hand, it has also been shown that other types of employees tend to be more satisfied with remote work conditions. The important point is that the personality traits that enhance job satisfaction clearly differ between remote work environments and non-remote work environments. It can be said that whether a person performs well at work or feels that work is rewarding depends on the suitability of the individual's personality and working environment. Regarding remote work after the COVID-19 pandemic, it is suggested that flexible management according to individual circumstances and preferences is important from the viewpoint of enhancing the well-being of workers.[17]

1. In this paper, we will discuss the term "remote work." Remote work is a concept that includes ICT-based teleworking and working from home. It is a concept that emphasizes that each staff member works away from the office rather than gathering at the office.
2. See Okubo (2020), Takami (2022).
3. Takami (2022) shows that about 30% of employed workers experienced working from home under the pandemic and the continuation rate of working from home as of December 2020 was about 60% of those who experienced working from home.
4. For example, Kitagawa et al. (2021) point out that teleworking under COVID-19 is less productive, citing poor work-from-home set-ups and communication difficulties as the main causes of productivity loss. Etheridge et al. (2020) argue that there have been cases of reduced productivity of teleworking under the lockdown in the UK.
5. According to a survey conducted by JILPT in June 2021, about 40% of respondents wanted to continue remote work even after the pandemic; on the other hand, more than half of respondents wanted to work in the office.
6. Barrick et al. (2001) describe the characteristic of "emotional stability", which is the opposite of "neuroticism", as the lack of anxiety, hostility, depression and personal insecurity.
7 Barrick et al. (2001) argue that the one situation in which agreeableness appears to have high predictive validity is in jobs that involve considerable interpersonal interaction, particularly when the interaction involves helping, cooperating and nurturing others.
8. See Bui (2017).
9. See JILPT (2021) for survey design.
10. See Gosling et al. (2003) for the Ten Item Personality Inventory (TIPI) index. For the reliability and validity of the Japanese version of the Ten Item Personality Inventory (TIPI-J) index, see Oshio et al. (2012).
11. Regarding this point, it is possible that remote work implementation and personality traits are related, but as far as the data in this paper are concerned, no correlation is observed.
12. Presence/absence of spouse, educational background, type of employment, industry, occupation, size of enterprise, years of service, region of residence, annual income in 2019, weekly working hours before COVID-19, and job satisfaction before COVID-19 are also controlled in the estimates shown in Table 4.
13. It is possible that remote work is continued because job satisfaction can be obtained with remote working. Therefore, we do not point out any causal relationship from the results of this analysis.
14. It is necessary to measure both the main effect and the interaction effect together to interpret what happens to job satisfaction with remote work when "extraversion" is high. This point is supplementarily examined in analysis (3). The results of analysis (3) show that "extraversion" is not related to job satisfaction in remote work.
15. Conversely, people with an introverted personality, such as reticence and modesty, are relatively less rewarded in terms of psychological satisfaction in the work style of working together in the office, but are less likely to suffer such disadvantages in remote work.
16. Although the results are not shown in the table, occupation and industry are not related to job satisfaction. It has been

confirmed that the personality traits of the individual rather than the job characteristics determine the job satisfaction of a remote worker under the current situation. At the same time, it is suggested that even in the same occupation, there are people who are likely to obtain job satisfaction from remote work and those who are not, depending on the personality of the individual.

17. In this paper, various problems associated with working from home, such as the problem of being unable to concentrate on work due to the presence of other family members, limited space at home, and the burden of housework and childcare, are excluded from consideration. Not only personality traits, but also these living environments should be considered in terms of the impact on work-related outcomes when workers perform remote work at home.

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TAKAMI Tomohiro

Vice Senior Researcher, The Japan Institute for Labour Policy and Training. Research interest: Sociology of work.
https://www.jil.go.jp/english/profile/takami.html

Claim for Unpaid Overtime by a Public School Teacher

The *Saitama Prefecture* Case
Saitama District Court (Oct. 1, 2021) 1255 *Rodo Hanrei* 5

HAMAGUCHI Keiichiro

I. Facts

X has been a public elementary school teacher employed by Y (Saitama Prefecture) since 1981. Under the provisions of a special measures law governing public school teachers' salaries (the Act on Special Measures concerning Salaries and Other Conditions for Education Personnel of Public Compulsory Education Schools, etc., referred to here as the "Education Personnel Salaries Act," EPSA, enacted in 1971) addressed further below, public school teachers are exempted from the application of provisions on premium wages for overtime work and work on days off set out in Article 37[1] of the Labor Standards Act (LSA), and instead receive a salary top-up equal to 4% of their monthly salary (*kyōshoku-chōseigaku*, literally "teachers' adjustment payment"). At the same time, the EPSA prescribes that overtime should be limited for work that falls under one of the following four categories: (1) practical courses for junior high and high school students, (2) school events, (3) staff meetings, and (4) disasters or emergencies in which it is necessary to take urgent measures to direct students (elementary, junior high and high school students, hereinafter "students"). X filed a suit in December 2018, seeking the payment of the premium wages (or compensation under the State Redress Act) for his overtime work between September 2017 and July 2018, on the grounds that said work did not fall under the above-mentioned four categories and the provisions of Article 37 (LSA) should therefore be applied according to the general rule.

II. Judgment

In its judgment on October 1, 2021, the Saitama District Court dismissed X's claims. Namely, it firstly recognized Y's claims, which were based on the premise that "unlike typical workers who work under the overall directions and orders of their employer, teachers' work is unique in the sense that they are expected to voluntarily and proactively engage in duties at their own discretion as suited to the education of students. The ways in which they engage in said work are also similarly unique due to the summer holidays and other such long school holidays during which they rarely engage in their primary task of teaching classes. Given these specific characteristics of teachers' work, it is unsuitable to closely manage actual working hours as applied in the case for typical workers," and that "as such work clearly differs in character to work conducted under the directions and orders of a supervisor, teachers who engage in such work outside of official working hours cannot immediately be determined to have engaged in work under the directions and orders of a supervisor." The District Court also recognized the claim that "due to the fact that the work of teachers is typically an inextricable combination of work that the teacher conducts proactively at their own discretion and the work that they engage in under the directions and orders of the

school principal, rendering it difficult to accurately distinguish between these two types, the current system does not in practice allow the principal, as the manager, to closely manage working hours to identify exclusively what amount of time was spent on work under directions and orders and pay salaries accordingly."

The judgment went on to address the purport of the provisions set out in the EPSA, noting that "having excluded public school teachers from the application of Article 37 (LSA) on the basis that the unique nature of teachers' work precludes it from the quantitative management of working hours applied to typical workers, the Act prescribes the payment of a salary top-up as a result of comprehensive evaluation of work performed out of hours, and limits the occasion in which teachers can be ordered to work overtime to four categories as a means of preventing the exemption from Article 37 (LSA) from resulting in longer working hours for teachers." On those grounds, the judgment concludes that teachers are "exempt from the application of Article 37 (LSA) with regard to not only the four overtime categories but also all forms of teachers' duties conducted outside of working hours." The District Court thereby rejected X's claim, stating that as the 4% salary top-up is "paid as a result of comprehensive evaluation of work conducted by teachers outside of working hours, and paid in lieu of an overtime work allowance for not only the work listed in the four overtime categories but also work outside of working hours to perform any other type of duty; therefore, it cannot be interpreted that the EPSA accounts for the possibility of duties other than those specified in the four overtime categories being compensated with the overtime premium wages prescribed in Article 37 of the LSA in addition to the salary top-up."

X's claim that having a teacher work overtime beyond the regulations set out in Article 32 of the LSA was in violation of the State Redress Act was also dismissed on the grounds that the overtime work did not directly pose a risk of damage to the teacher's health or welfare.

In concluding, the judgment also included an *obiter dictum* as follows: "The actual day-to-day conditions of teaching in Japan at present are such that many teachers have little choice but to conduct a certain amount of overtime work under the order to perform the duties or other such directions by the school principal. It must therefore be concluded that the EPSA, with its prescription of a salary top-up set at 4% of the monthly salary, no longer adequately reflects the actual conditions of teaching. It is a meaningful development that this issue has been highlighted for the public by the plaintiff's suit. In order to further enrich the education provided to students, who are Japan's future, it is the court's sincere hope that efforts will be made toward improving the actual working environments for teachers by promptly taking steps such as listening earnestly to the opinions of teachers, reducing the duties of teachers through work-style reforms, and seeking to develop a system for managing working hours and to review EPSA and other such salary structures in order to ensure that salaries are appropriately suited to the actual conditions of the work." It should, however, be noted that these observations have no impact on the content of the judgment.

III. Commentary

While this case has also attracted public attention, it must be said that the judgment itself is extremely poor. Firstly, the part in which Y's claims regarding the unique character of teachers' work are directly accepted does not stand up to logical analysis. It is certainly true that teachers' work is unique in comparison with the work of typical workers, in the sense that teachers may receive relatively little directions and orders and be allowed scope for independent decisions. Given such unique aspects, it can be suggested that the approach of establishing a special exemption for regulating teachers' working hours is to some extent rational. However, the unique characteristics of teachers' work that are referred to are the unique aspects of teachers as an occupation, which are entirely consistent across all types of schools, whether they be national, public, or private schools. At present, it is only public

school teachers who are exempt from the application of Article 37 of the LSA and to whom the EPSA is applied. In the case of both national school teachers and private school teachers, the provisions of the LSA are applied in full. Is this to suggest that such teachers' work does not involve the scope for independence and individual discretion that public school teachers are allowed?

Yet more incongruous is the fact that although at the time of its enactment in 1971 the EPSA was applied to both national schools and public schools, once national schools changed status in 2004 to become incorporated administrative agencies (the staff of which are not government employees), national school teachers were excluded from the exemption set out in the EPSA and came under application of the provisions of the LSA in full. Does this mean that 2004 saw national school teachers lose the independence and individual discretion that they had previously held? That is what is claimed by the Japanese Ministry of Education, Culture, Sports, Science and Technology (MEXT), but it is an implausible argument following a logic that quickly contradicts itself.

This judgment incidentally also traces in detail the developments leading up to the enactment of the EPSA, starting with a recommendation issued by the National Personnel Authority, but fails to touch on the key issue of why said act needed to be enacted in the first place. Prior to the EPSA, it was determined that teachers should not be ordered to work overtime in line with an administrative notification issued by the Ministry of Education, Science and Culture (currently MEXT), but as the reality was that teachers were often working overtime, a significant number of suits were filed by a teachers' labor union called the Japan Teachers' Union, leading to a succession of judgments recognizing payments of overtime allowances, which were ultimately confirmed by the Supreme Court in 1972. The EPSA was legislated in response to such developments and reflects such a background in the fact that it includes both exemption from the application of Article 37 (LSA) and a provision limiting overtime work to four categories as a general rule. This judgment does not give any consideration to the developments leading up to such legislation. The theoretical portion of this judgment can only be described as extremely low standard because it aimlessly accepts Y's claims, which are full of the kinds of contradictions noted above.

On the other hand, X's claims are also difficult to recognize when careful consideration is given to the application of the existing laws to this case (without addressing the laws' purports and objectives). X's claim is that the two provisions of the EPSA—namely, the payment of a 4% salary top-up in lieu of the application of Article 37 (LSA) and the limitation of overtime work to the four overtime categories—are closely interconnected (not only in their purport and objectives but also the scenarios to which they are applied), and therefore cases of overtime work other than that specified in the four overtime categories revert to the original provision —namely, Article 37 of the LSA applies—and yet, the nature of the provisions of the EPSA does not necessarily allow for such an interpretation.

Firstly, Article 6 of the EPSA merely orders employers to limit overtime work to "cases determined in municipal ordinances in accordance with the criteria set out in the Cabinet Order," such that any other overtime work simply constitutes a violation of said article by the employer, and the fact remains that it is overtime which is exempt from the application of Article 37 (LSA) in accordance with Article 5 (EPSA). X claims that the overtime work of a public school teacher can be divided into overtime work as categorized under Article 6 (EPSA) and all other overtime work, and that the latter does not fall under the application of the provision of Article 5 (EPSA) exempting the application of Article 37 of the LSA, but such an interpretation is not possible according to the provisions of the law.

Considering the aforementioned developments that prompted the enactment of the EPSA, it appears that the four overtime categories were introduced as an declaratory provision that sought to partially maintain the MEXT's façade (an official stance

divorced from reality) that teachers did not work overtime as a general rule, and it is not a provision that envisages cases of overtime to which LSA Article 37 is applied other than the overtime in the four overtime categories. The very EPSA itself merely states that overtime is restricted to "cases determined in municipal ordinances in accordance with the criteria set out in the Cabinet Order," such that the first appearance of the four categories is in a Cabinet Order, allowing limitless possibilities for expanding those categories depending on the way in which the Cabinet Order is determined, and, while there are outstanding theoretical issues, it is also impossible to suggest that these expansions are invalid when determined by municipal ordinances that go beyond the criteria of the Cabinet Order.

While the explanations by Y and MEXT regarding the purport of the EPSA are fundamentally flawed as discussed above, according to a literal interpretation of the provisions of the EPSA as a form of *ius positivum* (positive law— statutory man-made law), the only possible interpretation is that for public school teachers—and public school teachers *only*—overtime work is entirely exempted from the application of Article 37 of the LSA. Therefore, in this judgment, the conclusion—namely, that X's suit has no grounds and should be dismissed—alone is acceptable. All points regarding the reasons for reaching said conclusion can be refuted.

This conclusion is what could be described as *dura lex sed lex*—"the law is hard, but it is the law." The judgment would have been logically coherent if it had consisted of that conclusion with an *obiter dictum* such as the one provided in this case as final remarks. It is unfortunate that this judgment recognizes all of Y's explanations and even concludes with observations that contradict them, thereby adding a further layer of contradiction.

1. If an employer extends the working hours or has a worker work on a day off pursuant to the provisions of Article 33 or paragraph (1) of the preceding Article, it must pay premium wages for work during those hours or on those days at a rate of at least the rate prescribed by Cabinet Order within the range of not less than 25 percent and not more than 50 percent over the normal wage per working hour or working day; provided, however, that if the number of hours by which employer has extended the working hours it has an employee work exceeds 60 hours in one month, the employer must pay premium wages for work during hours in excess of those 60 hours at a rate not less than 50 percent over the normal wage per working hour. (LSA Art. 37 Para.1)

The *Saitama Prefecture* case, *Rodo Hanrei* (*Rohan*, Sanro Research Institute) 1255, pp. 5–38.

HAMAGUCHI Keiichiro
Research Director General, The Japan Institute for Labour Policy and Training. Research interest: Labor policy.
https://www.jil.go.jp/english/profile/hamaguchi.html

Special Feature on Research Papers (II)

Here is a special feature for two (I-II) including six significant papers selected by the Editorial Office of *Japan Labor Issues* from various relevant papers published in 2020–2021. Each author has arranged the original papers written in Japanese for the benefit of overseas readers. We sincerely thank authors for their effort. These papers address the latest subjects as well as conventional themes on labor and surely will offer useful information and deeper insights into the state of labor in Japan.

Editorial Office, *Japan Labor Issues*

The Future of the Japanese Long-Term Employment Society: The Consequences of Post-Industrialization and Increase of Unmarried Workers

IKEDA Shingou
TAGAMI Kota
SAKAI Kazufumi

This paper aims at revealing whether or not the long-term employment practice, which developed as a pillar of Japanese employment system under the economic growth after World War II, will sustain in the future under the expanding service economy and with increasing unmarried people. The results of data analysis of nationwide survey, which focus on regular employees, i.e., typical long-term employees, show that (1) even among large non-manufacturing enterprises, "finance and insurance; real estate and goods rental and leasing" and "transport and postal activities; information and communications" show a tendency toward long-term continued service that is similar to that of secondary industries such as manufacturing, etc. although there is great job mobility in the service industry, (2) unmarried women have more employment mobility, while women in the younger generation are gradually continuing to work for first-time companies, (3) it is true that the gap between the fluid employment type and the long-term employment type is not large in terms of anxiety of job loss, but the job changers have lower wage levels than the long-term employees even in the fluid employment sectors, and (4) when "tasks," which constitute a work unit smaller than "job" and "duty," are similar, it is possible to change jobs without suffering disadvantages in terms of wages. Consequently, it is hard to say that fluid employment becomes an alternative model to Japanese employment practice if expanding service economy and increasing unmarried people accelerate job mobility. Japan is still the long-term employment society in which there is great advantage of long-term employment even in the fluid employment sectors. Employment security is a crucial safety net even for unmarried workers at middle-age or older. It is, therefore, important to develop transferrable skills based on tasks in order to construct better fluid labor market with less disadvantage of job turn over.

I. Introduction

The practice of long-term employment is one of the most important and strongest pillars of the Japanese-style employment practice which was once seen to provide the source of high economic growth in Japan until the 1980s, compared to the Western Countries.[1]

However, the negative aspects of the Japanese employment system have become more conspicuous since the 1990s, when Japanese society was in the midst of a long-term economic downturn. Discussions toward reforming the system have been undertaken repeatedly and continue to this day (Kumazawa 1997, Hamaguchi 2009, Tsuru ed. 2019, Kambayashi and Hirano 2019). The Japan Institute for Labour Policy and Training (JILPT) is conducting a research project under its 3rd Mid-Term Plan Project (2014-2019), to examine the Japanese employment system's changes and continuation. The project has revealed that (1) as a matter of fact, the long-term employment practice for regular employees generally continues in large manufacturing companies, which are the "heart" of the Japanese employment system, even in the face of myriad changes—including the shrinking scope of long-term employment, the retreat of seniority-based treatment, the rise of selective training, and the transformation of workplace groups. The project has also pointed out (2) the declining performance of long-term employment and the widening differences in treatment among regular employees as practical issues. Further, it has identified (3) the clarification of realities in the employment system of large non-manufacturing companies, realities in the three-tiered employment system, and realities in the selection and development of so-called "global human resources" as issues worthy of research.[2]

We just mentioned that the long-term employment practice of regular employees generally continues as a matter of fact. Can we then say that long-term employment will continue to survive into the future? If, on the other hand, the long-term employment practice were to collapse and employment were to become more fluid, where and under what conditions would this occur? Conversely, if the practice were to survive, where and under what conditions would this be possible?

From FY2017 to FY2021, we have conducted "Research on Employment Systems that Adapt to Changes in the Industrial and Demographic Structure (Individual Survey Team)." We undertook this five-year project with a mind to ascertaining these conditions within the context of major social change—namely, change in the industrial structure on the labor demand side and change in the population structure on the labor supply side. This paper summarizes the key points of the project's interim report.[3]

Here, "change in the industrial structure" refers to the shift from an industrial structure built mainly around manufacturing to a non-manufacturing-based industrial structure (i.e., post-industrialization). On the other hand, "change in the population structure" refers to Japan's declining birthrate and aging population. This paper focuses particularly on the increase in unmarried people, which is at the center of the declining birthrate problem. We chose "The Future of the Japanese Long-Term Employment Society" rather than "The Future of the Japanese Long-Term Employment" as our title precisely because we intend to explore the relationship between such a major social change and long-term employment.[4]

II. The challenges facing the Japanese long-term employment society

1. Two aspects of long-term employment: human resources utilization and safety net

It goes without saying that companies hire people because they need labor for their economic activities. The nature of those economic activities differs from industry to industry.

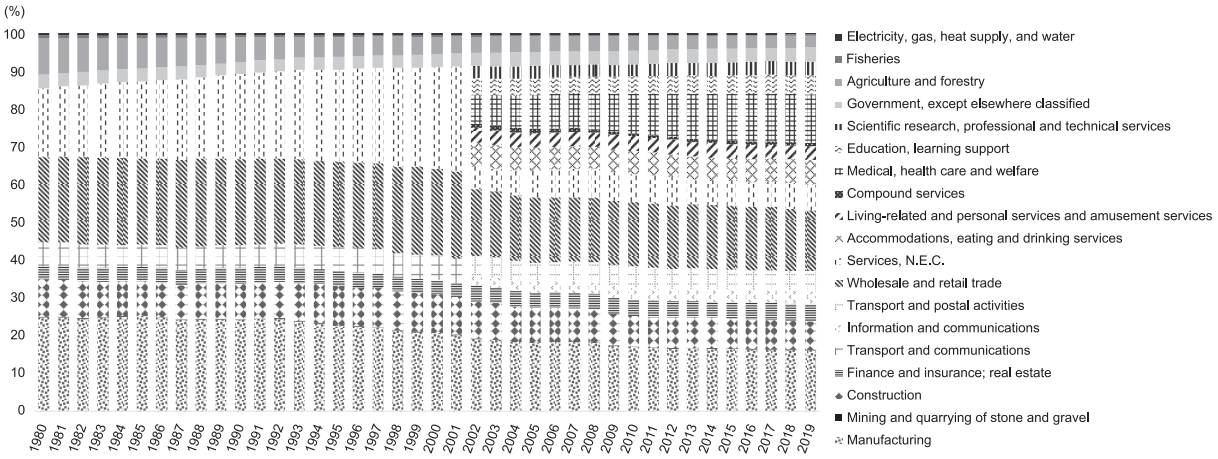
In years past, when the Japanese employment system received high marks for its international competitiveness, it was manufacturing that drove the economy, even among large enterprises. In some respects, the long-term development and utilization of human resources through long-term employment was justified by its compatibility with the business of manufacturing (Koike 1999). Today, however, the number of workers in manufacturing is decreasing, while the number of workers in non-manufacturing industries (i.e., the tertiary

sector) is increasing (Figure 1).

The number of people employed in hospitality and sales-related service industries, such as "wholesale and retail trade" and "accommodations, eating and drinking services," has always been large. In addition, a conspicuous increase in workers has been seen in the "medical, health care and welfare" and "information and communications" sectors since the year 2000. The reasons for this are easy to see if one considers the increasing demand for nursing care labor associated with the growing elderly population and the increasing demand for information technology (IT) engineers arising from the shift to IT. Though slight, upward trends are also apparent in the "education, learning support" and "scientific research, professional and technical services" industries. When viewed in the contexts of people, things, money, and information, these industries differ in nature from the secondary sector of industries which produce "things," in that they involve "people" and "information." The "finance and insurance" and "real estate" industries involve businesses that deal with money. Although the number of workers in these industries is small overall, the finance sector's impact on society is growing.

These industries differ from manufacturing in the way they produce the goods that are the output of their production activities. Thus, it is not surprising that production management and human resources management approaches that are modeled on manufacturing do not fit well with these industries. P. Cappelli (1999) identifies a shift in American companies from the "Old Deal," which was driven by manufacturing, to a "New Deal" driven by Silicon Valley's IT industry. Sugeno (2004) asks, with reference to Cappelli, whether a shift from the Old Deal to New Deal—in other words, the dismantling of the Japanese employment system—will also occur in Japan. Will the expansion of non-manufacturing industries lead to a new employment system deserving the appellation "Japanese New Deal"?

It is important to note that long-term employment is not being sustained solely by the management decisions of individual companies. One must also look at the aspects of long-term employment that have provided the foundation for daily living in postwar Japan (Hazama 1996). For example, long-term employment has a bearing on long-term prospects in life planning; namely, getting married and having and raising children. However, if we look at this from the other side, we see that increasing destabilization of youth employment since the 1990s has led people to remain unmarried and resulted in falling birth rates (Nagase 2002). In other words, if long-term employment is necessary for providing people with livelihood security, then we cannot deny that long-term employment functions as a social system, regardless of what company management does.



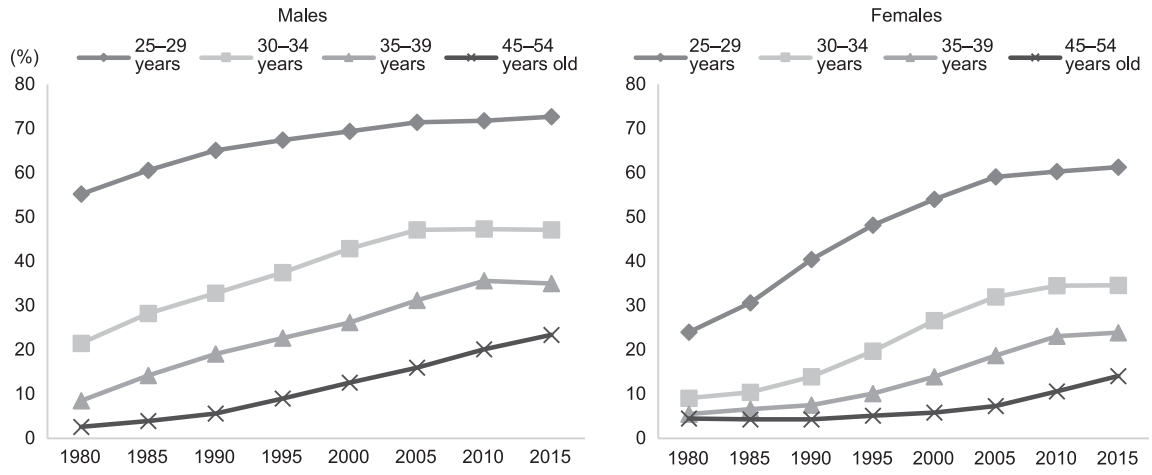
Source: Ministry of Internal Affairs and Communications, "Labour Force Survey."
Note: "Wholesale and retail trade" up to 2001 includes "eating and drinking establishments," and "finance and insurance; real estate" includes "goods rental and leasing" from 2002.

Figure 1. Changes in number of employed persons by industry

Thus, long-term employment has two aspects: it ensures the long-term utilization of human resources in economic activities and provides the foundation for stable living. We can categorize the former as long-term employment for human resources management and the latter as long-term employment that provides a safety net in the sense that it is part of the livelihood security system. In the latter half of the 20th century, Japan was a society in which employees with long years of continued service were given preferential treatment in terms of both economic activities and safety nets. In this sense, Japan could be described as a long-term employment society.

When we look at long-term employment as a safety net, we see there are likely instances where long-term employment is sustained for the sake of livelihood security even when it is not advantageous to companies' economic activities. A problem that has been identified from this perspective is long-term employment's relationship with Japan's declining birth rate and aging population. Companies' support for combining work and family life was originally intended as a policy for achieving gender equality. However, as society's concern over the declining birthrate and aging population grows, it is increasingly taking on aspects relating to employment security as a form of social security. The Childcare Leave Act, which was enacted in 1991, requires companies to provide childcare leave. It arose from a growing sense of crisis within the government over the demographic changes brought by the nation's declining birth rate. In 1995, the Childcare and Family Care Leave Act was enacted, adding provisions for nursing care to the Childcare Leave Act. Behind this new law was another change in the demographic structure—an increase in the elderly population. It provides protections to workers to ensure that they do not lose jobs due to such family responsibilities as childcare and nursing care. The employment that is thereby protected is "employment as a safety net," rather than the continuation of a business relationship within production activities.

When viewed in terms of family responsibilities, it is unlikely that the policy of continuing the employment relationship as a safety net will change significantly. However, there is a growing problem that cannot be addressed with the concept of combining work and childcare/nursing care on the premise of a family founded on marriage. That problem is an increase in the number of unmarried people (Figure 2). Tendency toward remaining unmarried has aspects that are compatible with fluid employment. It is well known that fluid employment owing to company convenience—in other words, employment instability—is a cause behind people's decision to remain unmarried (Nagase 2002). Besides, being unmarried undoubtedly has compatibility with fluid employment even when workers' convenience is taken into account. This is because workers can change jobs without considering the circumstances of spouses or children in the way that married people do.



Source: Ministry of Internal Affairs and Communications, "Population Census."

Figure 2. Trends in the percentage of unmarried people by sex and age group

It is said that Japan used to be a "marriage-oriented society" in which everyone gets married. But if we were to simplify matters, we may find that it is possible to arrange the relationship between work and life in terms of "a marriage-oriented society means long-term employment; an increasingly unmarried society means fluid employment." However, this does not mean that unmarried people do not have family responsibilities. People can face the problem of caring for elderly parents even if they are not married. In other words, even if people do not have the responsibility of a "family of procreation" (i.e., a family through getting married and having and raising children), they do have the responsibility of their "family of orientation" (i.e., the family in which they were born and raised). Here, there is room to consider whether it is desirable to encourage unmarried people to stay in the same company in the way that married people do, or whether it is better to raise employment fluidity by encouraging people to change jobs and go to companies that make it easier to combine work and family life. Allowing people to choose a workplace that permits them to combine work and family life by changing jobs, rather than staying within the same company, must certainly be conceivable.

Bearing the points described above in mind, we would like to focus on the non-manufacturing sector's expansion within the industrial structure (post-industrialization) as well as the growing unmarried population in the demographic structure.

2. Two types of fluid employment: spiral and circulating

Even in the past, the long-term employment practice was not seen everywhere in Japanese society. If the "long term" of long-term employment practice is typified as beginning with hiring as a new graduate and ending with retirement, then it must be noted that many small- and medium-sized enterprises (SMEs) do not hire new graduates and do not set a mandatory retirement age. In these companies, mid-career hiring and mid-career separation are common. Accordingly, the question of long-term employment's viability tends to be asked with respect to large enterprises rather than the other company sizes.

Additionally, questions concerning long-term employment's viability do not arise with respect to part-time workers, temporary workers, contract workers, dispatched workers, and other non-regular employees. In reality, some non-regular employees continue working for the same company for decades. However, ending up working for a long time is a different issue from being hired with the intention of working for a long time from the very beginning. The fact that non-regular employees work for one company for a long time can be seen as a derivative phenomenon of the long-term employment practice. However, it is a derivative phenomenon, not a core phenomenon. It is the long-term employment of regular employees that deserves attention here.

Furthermore, even among regular employees, it is the trend surrounding male regular employees that is the first point of focus. In traditional Japanese employment society, long-term employment was an employment practice exclusively applied to men. Women were not expected to continue working long-term in the same way as men, even when they were also regular employees (Imada 1996; Inagami 2005). More than 30 years have passed since the enactment of the Equal Employment Opportunity Act between Men and Women, and during that time the gap between men and women in terms of years of continued service has narrowed. However, while it is necessary to consider that the gap with men is narrowing as the continued service years of women (who typically had shorter service years) increase, it is also necessary to consider the possibility that the gap with women is narrowing because the continued service years of men (who typically worked for many years) are becoming fewer. The latter viewpoint has more importance when it comes to the question of whether long-term employment, which is at the heart of the Japanese employment system, is collapsing.

Finally, there is one more thing to keep in mind, and that is long-term employment's quality as a desirable form of employment. Regular employees of large enterprises, where long-term employment is commonplace, have stable employment and high wages. On the other hand, employees of SMEs and non-regular employees have unstable employment and low wages. In other words, when it comes to disparities in worker treatment (i.e., working conditions, pay, etc.), large enterprises and regular employees with long-term employment and SMEs and non-regular employees with fluid employment are not on equal footing, and a hierarchy exists in

which large enterprises and regular employees have "primary" status and SMEs and non-regular employees are "secondary." Accordingly, we cannot conclude that the long-term employment practice has collapsed if mid-career hires and mid-career separations increase simply as a matter of number of workers and enterprises. If mid-career hires and mid-career separations increase in a labor market with lower levels of employee treatment, the conclusion would be that this is simply the result of an expansion in the secondary labor market. It must be asked whether a fluid labor market can expand as an alternative to the labor market that both labor and management see as the desired form of employment.

In short, a task of this study is to clarify whether fluid employment is occurring in a "high quality" manner among the regular employees of large enterprises.

When the problem is arranged in this way, even if active job changes are observed in statistical data, those changes cannot immediately be evaluated as representing an alternative to the long-term employment practice. Therefore, we examine labor markets with fluid employment by classifying them into at least two types.

When viewed in terms of movement of human resources and better employee treatment, human resources in the internal labor market in the Japanese employment system have developed their skills by being circulated within the company (i.e., "job rotation") and made upward movement through promotions. We call this "spiral" labor movement in the sense that human resources move upward while moving around and around within the company like a spiral. The ability-based grade system and seniority-based wage system can be described as human resource management systems that assume a spiral-like movement of labor within the company.

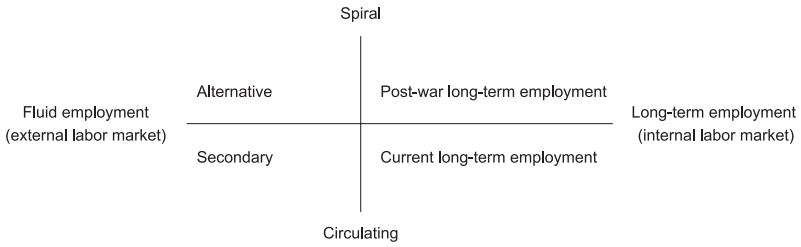
When this kind of upwardly mobile career is considered to be the starting point, a labor market with fluid employment must permit spiral-like labor movement through job changes if it is to be as good as or better than long-term employment. The New Deal ideal presented by Cappelli (1999), in which employment is made fluid to improve corporate performance, is similar to this spiral-like movement. Through active job changes, new personnel bring new knowledge and skills to the company, and the company prospers by creating new services. This is similar to what happens in Silicon Valley. Looking at the labor market as a whole, the New Deal and its good corporate performance are replacing the Old Deal and its poor performance. This can be described as fluid employment through which companies earn higher profits by hiring immediately effective mid-career workers rather than hiring and training new graduates, and individuals earn a higher income by changing jobs rather than staying with the same company for a long time.

However, there is another type of fluid employment that does not have a positive impact on production. In some cases, companies may hire mid-career workers simply because they have a shortage of manpower in terms of quantity rather than to create new services. Also, individuals may change jobs simply because they have some reason to quit their original job, without considering their career advancement.

If employment is thought of as a safety net, it becomes easy to understand changing jobs simply to avoid unemployment. However, when it comes to the human resources management, hiring to fill manpower shortages does not always occur in growth fields. There are jobs that, although suffering from low productivity and having no prospects for growth, are labor-intensive and thus have chronic manpower shortages. The image here is of people simply moving—only circulating—between the companies without upward movement. We call this "circulating" fluid employment. If you think of a fan that circulates the air in a room (i.e., an air circulator), the image of air circulating up, down, left, and right fits precisely with the concept of circulating fluid employment. It is not always the case that the human resources sent out by a company will move toward higher wages. Sometimes their wages will fall. In fact, the New Deal presented by Cappelli (1999) also contains a conceptual image similar to circulating fluidity.

In dividing fluid employment into two categories in this way, the question of whether fluidity is "secondary" or "alternative" can be replaced by the question of whether spiral-type employment fluidity can be verified.

Of course, in reality, both the internal labor market and the external labor market could be simply circulating, providing few opportunities for upward movement. Not all personnel rotations within a company



Source: JILPT (2021): 8.

Figure 3. Classifications of labor movement types inside/outside companies

can be said to promote the growth of the company and the individual. Some reassignments are simply for the purpose of adjusting labor supply and demand within the company and alleviating manpower shortages. Even when viewed from the worker's standpoint, a transfer for a worker who is willing to be promoted is an opportunity for growth—or in other words, it represents spiral movement. However, a transfer is of the circulating-type for a worker who has no eye on promotion and just wants to quietly go about his or her daily work. In some cases, a person who desired upward movement at a young age experience lessening desire with age. There are also cases where illness or injury may cause a person to experience circulating movement instead of spiral movement.

In short, both long-term employment and fluid employment can be thought of as being spiral and circulating. Figure 3 arranges this into types demarcated by two axes and four quadrants. Japan's postwar employment society flourished as a spiral-type long-term employment society. However, from the findings on the employment system of JILPT's 3rd Mid-Term Plan Project, the benefits of long-term continued service have declined following the collapse of Japan's "bubble economy" in the 1990s, and it could be said that modern long-term employment is becoming more circulating in nature. The question is whether spiral-type employment fluidity is occurring as an alternative to this. However, if Japan's long-term low growth since the 1990s and aging working population are taken into account, one can speculate that it is unlikely that a spiral-type labor market is undergoing new expansion. Even if employment fluidity is occurring, it may be that the only labor market that is expanding is the low-productivity secondary market. With consideration for this and other possibilities, we intend to form a picture of the current state of Japan's long-term employment society by grasping the realities of long-term continued service and job change behavior with a dispassionate eye. By doing so, our study will seek to clarify issues that will become the premises for examining future employment policies.

III. Survey outline

We planned the following nationwide questionnaire survey titled "Survey on Occupation and Working Life" to clarify the actual situation of individuals' retention of employment in the same company and leaving/changing employment in their employment behavior. The survey targeted 12,000 men and women aged 25 to 64 throughout Japan. We used stratified two-stage sampling as the sampling method and conducted the survey through visiting and leaving method via surveyors. The survey was conducted in November and December 2019, which was before the outbreak of the COVID-19 pandemic. The number of valid responses totaled 5,977 (response rate of 49.8%). We outsourced the work of conducting the survey to Nippon Research Center, Ltd.

The main survey items included movement history with respect to the respondent's first job, previous job, and current job; family life (i.e., marriage, childbirth, child-rearing, nursing care, etc.); social networks; connection with the community; overseas interactions (i.e., experience of living overseas, overseas dealings in work, etc.); health; and attitude toward long-term employment. However, in the following analysis, it is the

respondent's employment status in his/her first job and his/her experience of changing jobs that are the important variables. The workers who continue to work without leaving their first place of employment can be regarded as the "long-term employment group." Conversely, the workers who have experienced changing jobs can be regarded as the "fluid employment group." This paper focuses on the regular employees as core labor forces of long-term employment practice.

As Imada (2000) showed, in today's Japanese society, there are both people who support the Japanese employment system and people who support its reform. These two groups have different values not only in terms of employment but also in terms of their lifestyles. In the context of this study, one could say that the long-term employment group and the fluid employment group live in different worlds. The survey was designed to shed light on where the boundary between these two social worlds lies. We conducted our analysis based on the hypothesis that industry on the labor demand side and the presence or absence of family responsibility on the labor supply side may be the factors that draw that social boundary.

IV. Analysis results

1. Aspects of fluid employment

(1) Post-industrialization and fluid employment[5]

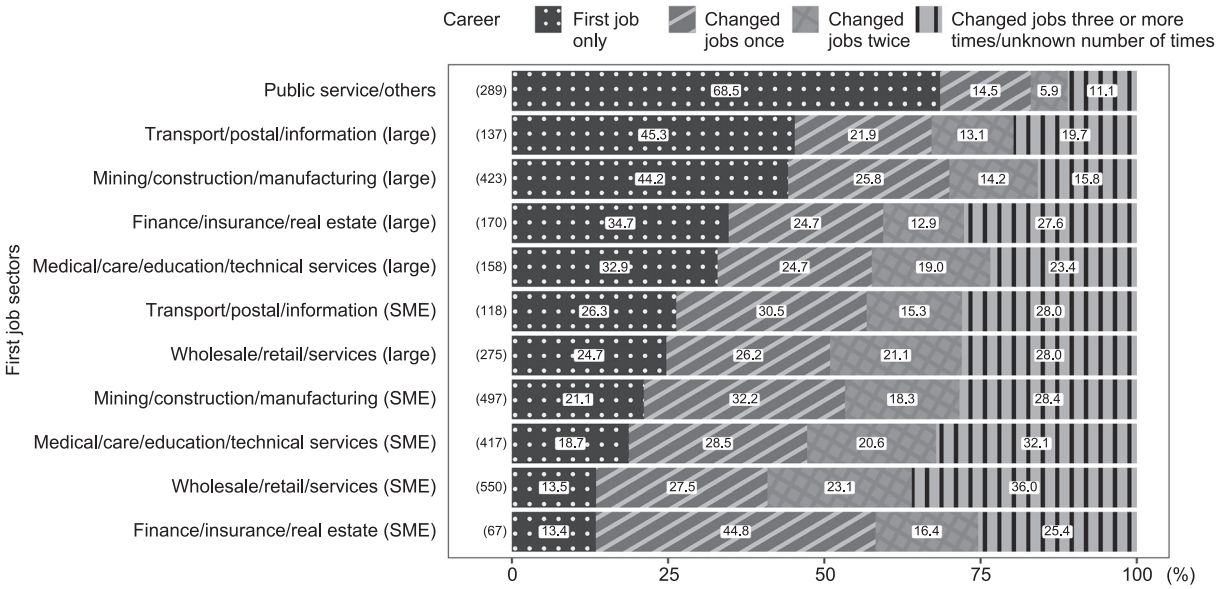
First, we looked at those respondents whose first job after graduating from school (their "first job") was regular employment and examined the industries of their first job employers by sex and birth cohort. For the industrial classifications, we used seven classifications that are based on the Japan Standard Industrial Classification (Table 1).

A look at the main characteristics shows that, first of all, the percentages of "mining and quarrying of stones and gravel; construction; manufacturing," which can be considered to be at the center of the long-term employment practice, show little change in any of the cohorts of males, remaining in the upper 30% range. When looking at males alone, this is the industrial category with the highest percentages among all of the cohorts. For females, on the other hand, the percentage decreases as the cohorts get younger. As a result, the differences in the percentages of males and females in "mining and quarrying of stones and gravel; construction; manufacturing" are larger in Cohorts III and IV. This suggests that these are industries in which

Table 1. Industries of employers of first-job regular employees by sex and birth cohort

			First job/industry						
			Mining and quarrying of stones and gravel; construction; manufacturing	Finance and insurance; real estate and goods rental and leasing	Transport and postal activities; information and communications	Wholesale and retail trade; accommodations, eating and drinking services; amusement services; services, N.E.C.	Medical, health care and welfare; education, learning support; professional and technical services	Public service	Others
Males	I	1955–64 (603)	38.1%	5.8%	9.0%	25.2%	9.8%	8.1%	3.0%
	II	1965–74 (685)	39.6%	6.0%	10.1%	26.3%	10.2%	4.8%	1.8%
	III	1975–84 (485)	39.2%	2.9%	13.6%	22.5%	13.8%	5.6%	1.4%
	IV	1985–94 (298)	36.9%	5.4%	10.7%	19.8%	15.8%	8.1%	2.0%
		Total (2,071)	38.7%	5.1%	10.7%	24.1%	11.7%	6.4%	2.1%
Females	I	1955–64 (731)	20.5%	14.2%	3.4%	32.1%	24.4%	1.4%	1.8%
	II	1965–74 (765)	21.2%	10.6%	5.6%	31.0%	26.3%	2.2%	1.6%
	III	1975–84 (541)	16.6%	8.5%	4.1%	30.9%	35.9%	2.4%	0.9%
	IV	1985–94 (320)	13.8%	8.1%	5.6%	28.8%	36.3%	5.0%	1.6%
		Total (2,357)	18.9%	10.9%	4.6%	31.0%	29.2%	2.4%	1.5%

Source: JILPT (2021): 25.
Note: The percentages of "no response" are not shown but are included in aggregation.



Source: JILPT (2021): 34.
Note: Industrial sectors and size of enterprise in Figures 4, 5, 6 and10 are classified as follows:

Sector	Industry
Mining/construction/manufacturing	Mining and quarrying of stone and gravel; construction; manufacturing
Finance/insurance/real estate	Finance and insurance; real estate and goods rental and leasing
Transport/postal/information	Transport and postal services; information and communications
Wholesale/retail/services	Wholesale and retail trade; accommodations, eating and drinking services; amusement services; services, N.E.C.
Medical/care/education/technical services	Medical, health care and welfare; education, learning support; professional and technical services
Public service/others	Public service or government office/public office; agriculture, forestry; fisheries; electricity, gas, heat supply, and water

Size of enterprise	Number of employees
Large (large enterprises)	300 or more employees
SME (small-and-medium sized enterprises)	Fewer than 300 employees or unknown

Source: JILPT (2021) Figure 2-1-1. Industrial sector classifications: 33.

Figure 4. Number of job changes by industry/size of enterprise of first-job regular employees (born between 1960 and 1989)

men easily find employment but women do not find (or have difficulty finding) employment.

Secondly "medical, health care and welfare; education, learning support; professional and technical services," which can be considered to be industries symbolic of post-industrialization and the advancement of the service economy, increase in percentage with younger cohorts for both men and women. The percentages are particularly high for women in this category, surpassing "wholesale and retail trade; accommodations, eating and drinking services; amusement services, services, N.E.C." to take the top spot with about 36% of the total in Cohorts III and IV. Likewise, for men, the percentage is about 16% in Cohort IV, meaning that "first job" accounts for a higher percentage of "medical, health care and welfare; education, learning support; professional and technical services."

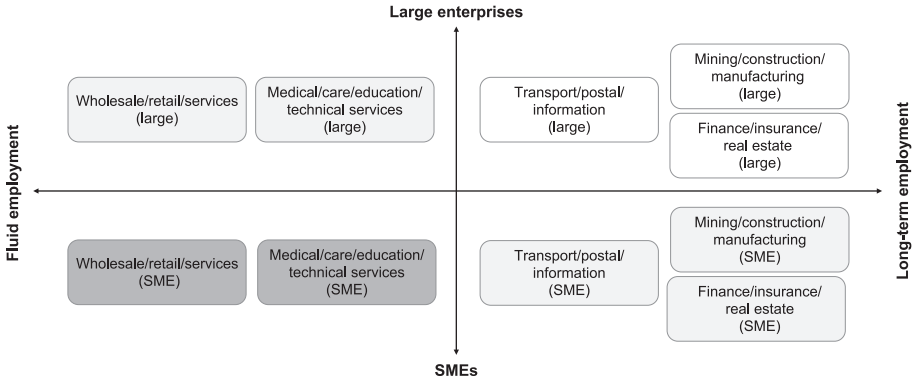
Next, we examine whether there are differences in the careers of workers depending on the industry and size of their employers in their first jobs. Based on the number of job changes since the first job, we consider,

for example, the phenomenon whereby workers in "mining and quarrying of stones and gravel; construction; manufacturing," which are at the heart of the long-term employment practice, have more long-term employment careers, while workers in "medical, health care and welfare; education, learning support; professional and technical services," which are symbolic industries of post-industrialization and the advancement of the service economy, have more fluid careers. Specifically, we look at the number of job changes to date by industry and size sector of first job—in other words, the distribution of career types by industry and size sector of first job.[6]

A look at Figure 4 shows that the percentages of "first job only" are relatively high in the "large enterprise" sector of "mining and quarrying of stones and gravel; construction; manufacturing," "finance and insurance; real estate and goods rental and leasing," and "transport and postal activities; information and communications" as well as the "public sector." In the three sectors other than the "public sector," about 35–45% of all respondents are continuing in their first job. These can be described as the "long-term employment sectors." In contrast, the percentages of "first job only" are relatively low in the broadly defined service sector and "SME" sector. These sectors are characterized by fluid employment.

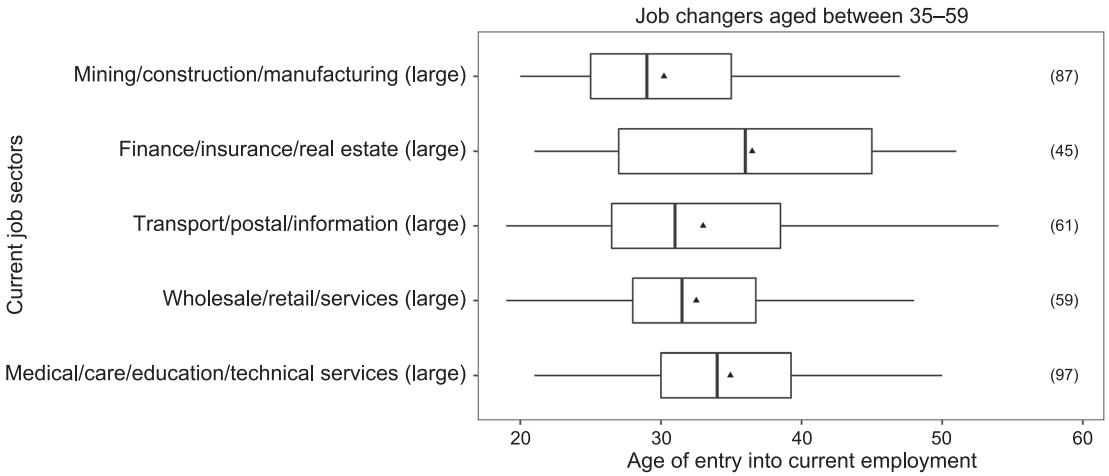
In addition, in none of the sectors is the weight of "changed jobs twice" within careers having job changes large. Such careers tend to be polarized into "changed jobs once" or "changed jobs three or more times/unknown number of times." In particular, the "SME" sectors of "medical, health care and welfare; education, learning support; professional and technical services" and "wholesale and retail trade; accommodations, eating and drinking services; amusement services; services, N.E.C." have the highest percentages of "changed jobs three or more times/unknown number of times" among the careers. These sectors are typical fluid employment sectors. On the other hand, in the case of "finance and insurance; real estate and goods rental and leasing," the same SME sector has the highest percentage of "changed jobs once" and a low degree of fluid employment. In the SME sectors of "mining and quarrying of stones and gravel; construction; manufacturing," "finance and insurance; real estate and goods rental and leasing," and "transport and postal activities; information and communications" as well as the "large enterprise sector" of the broadly defined service industry, the total of "first job only" and "changed jobs once" exceeds the majority. If the condition for long-term employment is relaxed to "changed jobs once," it could be said that these sectors are of the long-term employment type.

Figure 5 summarizes the results of the above analysis and charts the first job sectors with long-term/fluid employment on the X-axis and the size of the enterprise (large or SME) on the Y-axis. The upper right (first quadrant) and lower left (third quadrant) of the figure indicate the typical long-term employment type and fluid employment type, respectively. The upper left (second quadrant) and lower right (fourth quadrant) are in the intermediate positions of the sectors as a whole. However, these sectors have fluid employment-like



Source: JILPT (2021): 42.

Figure 5. Employment system types by industry



Source: JILPT (2021): 70.
Notes: 1. The triangles in the figure indicate the average value, the left side of the box indicates the first quartile, the right side indicates the third quartile, and the thick line in the center indicates the second quartile (median). The whiskers on the sides indicate the first quartile from the smallest value and the third quartile from the largest value, respectively.
2. The numbers in parentheses on the right-hand side indicate the number of samples (N).

Figure 6. Ages of entry into current employment of job changers by industry

characteristics when compared within the context of large enterprises. While, overall, a two-tiered structure exists between the enterprise sizes, employment systems differ from industry to industry, even within large enterprises.

Next, we examine whether, in the fluid employment sector, workers of that sector continue having fluid employment throughout their lives, without any long-term employment tendencies whatsoever, or whether they develop a long-term employment tendency by becoming fixed at some point as they age. Figure 6 shows ages of entry into current employment for current regular employees aged 35–59 in a box plot by industry. By limiting the sample to respondents who have experienced changing jobs (hereinafter "job changers"), it becomes possible to understand the age of entry into current employment here as the "job change age that is (can be considered to be) permissible in the sector."[7]

Figure 6 shows that, with the exception of "finance and insurance; real estate and goods rental and leasing," the third quartile of age of entry into current employment is under 40 years. In each of the sectors except "finance and insurance; real estate and goods rental and leasing," fewer than 25% of the respondents entered their new jobs after the age of 40.

Similarly, the median age of entry into current employment is 35 or younger, with the exception of "finance and insurance; real estate and goods rental and leasing." Thus, in each sector except "finance and insurance; real estate and goods rental and leasing," half of job changers entered their current job at the age of 35 or younger. Because the sample is limited to respondents between the ages of 35 and 59, it is also apparent that half of new job entrants have stayed at their current job for at least a few years after changing jobs.

Except for "finance and insurance; real estate and goods rental and leasing," there is no tendency for the interquartile range to widen significantly, and the variation in ages of entry into current employment of job changers is not large. Regardless of whether the employment type is long-term or fluid, job changes are occurring in people's late 20s and early 30s.

In other words, the "fluidity" of the fluid employment sector is "a weak tendency to continue the first job for a long period of time, and a tendency to become fixed in employment after several job changes in youth and middle age." In this sense, it is not possible to say that the fluid employment sector is so "fluid" as to be able to be perfectly in contraposition to the long-term employment sector.

In summary, the industries of men's first-job employers are not undergoing as much post-industrialization and service economy advancement as those for women. Moreover, "mining and quarrying of stones and gravel; construction; manufacturing," which are at the center of the Japanese-style employment practice, make up more than one-third of the labor market.

Looking at careers by industry and size sector of first job, even among large non-manufacturing enterprises, "finance and insurance; real estate and goods rental and leasing," "transport and postal activities; information and communications" show tendencies toward long-term continued service that are similar to those of manufacturing and other secondary industries. However, in the service sector, the "first job continuity rate" is low and a tendency toward employment fluidity is apparent. Put another way, these findings suggest that two kinds of labor markets coexist—a long-term employment-type market and a fluid employment-type market. However, our analysis of the ages of entry into current employment of job changers shows that, even in the fluid employment sector, few people change jobs after the age of 40. Even as the employment of people in their 20s and 30s becomes more fluid, people in their 40s and beyond tend to remain with their companies.

(2) The increase in unmarried workers and fluid employment[8]

In this section, we focus on unmarried workers, whose number is increasing. In order to consider whether unmarried workers (whose life courses differ from those of standard household) desire long-term continued service, we examine the job continuation status of first-job regular employees and the job-continuation intentions (inclination to stay) of current regular employees, based on a comparison with married men and women. To begin, let us look at the continuation status of first job in regular employment of unmarried respondents at the points of three, five, and ten years after entering their first job in comparison with those of married respondents (Table 2).

The percentages of unmarried males who continue to hold their first regular-employment jobs for "10 years" are about 5 percentage points higher overall than those of married males. However, they are in the upper 50% to lower 60% range, confirming the trend toward long-term first-job employment. For females, the

Table 2. First-job continuation status and difference of unmarried and married respondents by sex and birth cohort (Limited to respondents who were regular employees in their first job and current job)

		Males						Females					
		Unmarried at all time points											
		3 years		5 years		10 years		3 years		5 years		10 years	
		Continuing	Valid N	Continuing	Valid N	Continuing	Valid N	Continuing	Valid N	Continuing	Valid N	Continuing	Valid N
I	1955–64	82.4%	(227)	73.4%	(188)	65.3%	(95)	77.1%	(83)	62.9%	(62)	39.3%	(28)
II	1965–74	81.2%	(373)	74.8%	(314)	68.2%	(176)	74.5%	(184)	58.6%	(145)	46.3%	(82)
III	1975–84	81.6%	(316)	69.0%	(268)	52.6%	(137)	74.2%	(163)	59.5%	(131)	30.9%	(68)
IV	1985–94	83.8%	(204)	73.5%	(132)	78.1%	(32)	78.2%	(142)	64.3%	(98)	44.0%	(25)
	Total	82.1%	(1,120)	72.6%	(902)	63.4%	(440)	75.7%	(572)	60.8%	(436)	39.9%	(203)
		Married at all time points											
I	1955–64	83.3%	(36)	71.6%	(74)	55.8%	(163)	75.7%	(37)	53.4%	(58)	33.7%	(92)
II	1965–74	81.8%	(66)	70.2%	(124)	61.2%	(260)	58.8%	(34)	51.4%	(72)	43.6%	(133)
III	1975–84	85.1%	(47)	76.9%	(91)	56.6%	(212)	61.5%	(26)	50.0%	(58)	47.1%	(119)
IV	1985–94	93.1%	(29)	75.4%	(65)	59.3%	(54)	78.6%	(14)	62.1%	(29)	50.0%	(28)
	Total	84.8%	(178)	73.2%	(354)	58.3%	(689)	67.6%	(111)	53.0%	(217)	42.7%	(372)
		Difference of unmarried and married respondents (difference of unmarried % - married %)											
I	1955–64	-1.0		1.8		9.4		1.4		9.5		5.6	
II	1965–74	-0.6		4.7		7.0		15.6		7.2		2.7	
III	1975–84	-3.5		-7.9		-4.0		12.7		9.5		-16.2	
IV	1985–94	-9.3		-1.9		18.9		-0.4		2.2		-6.0	
	Total	-2.8		-0.5		5.1		8.1		7.8		-2.8	

Source: JILPT (2021): 109.

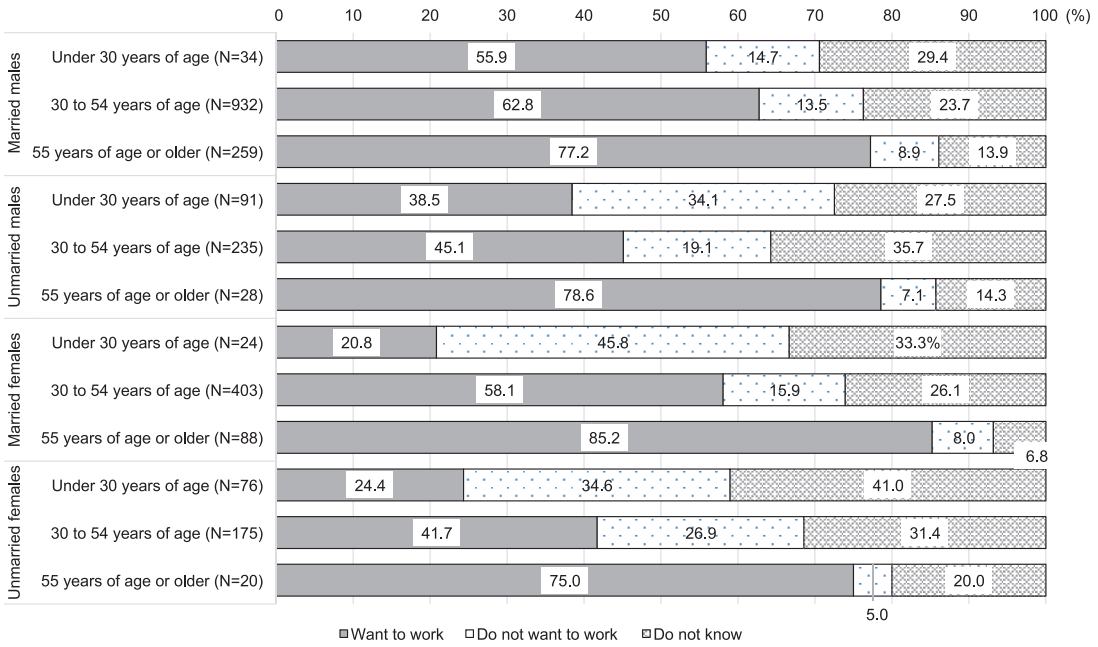
percentages of unmarried persons continuing in their first job are higher than those of married persons. However, looking at those who have continued their first job for "10 years," married persons in the 1975–84 birth group (35–44 years old at the time of the survey) tend to have longer continued service in their first job than unmarried persons. The 1975–84 birth group is a generation falling under the amended Equal Employment Opportunity Act of 1997 (the second generation under the act). Thus, the above result may be the effect of policies that encourage married women to continue in long-term employment, such as the revised Equal Employment Opportunity Act, the revised Child Care and Family Care Leave Act, and the Act on Advancement of Measures to Support Raising Next-Generation Children. A tendency to long-term continued service among females becomes much more pronounced with younger generations. However, a tendency is seen whereby married women stay with their companies while unmarried women have more employment fluidity.

Additionally, looking at unmarried persons, the percentages of men who continue in their first job are consistently higher than those of women. Unmarried women tend to change jobs rather than stay in their first job, and there are signs that the gender gap is widening in the younger generation. Even among married people, the percentages of men who continue to work at their first job are consistently higher than those of women. However, the difference between men and women who continue to work at their first job for "10 years" narrows to the 9 percentage point level. This indicates that married women are increasingly continuing to work at their first job.

In other words, it can be said that female workers fall into two trends (changes): that of married people who become more established in their first job through long-term employment, and that of unmarried people who do not become established in their first job and whose employment becomes fluid. By being linked to family formation within the "life course" of school graduation → employment → marriage → birth of first child, the long-term employment practice has formed a system of gender-specific employment management whereby men have long-term employment while women retire early and then subsequently attain fluidity through non-regular employment and other forms of short-term employment when they seek re-employment. On the other hand, measures to support women's continued employment, such as the Equal Employment Opportunity Act and the Child Care and Family Care Leave Act, have aimed to correct disparities existing between men and women in terms of continued employment. An increase in the first job continuation rate of married women was confirmed to have taken place as a result of these measures; however, unmarried women tended to be more fluid than their unmarried male counterparts. It could be said that work-life balance support measures implemented as policies to keep women from leaving employment due to marriage or childbirth were effective for married women. However, it is highly probable that those policy protections have not been extended to unmarried women in terms of continuing their first regular-employment jobs. Although work-life balance support measures have penetrated throughout society to some extent, the fact that equal opportunity policy remains inadequate may be behind women's changing jobs before those measures are applied.

Next, we put a focus on respondents' long-term employment intentions and inclination to stay in their jobs as they look to the future: i.e., whether they want to work until they reach mandatory retirement age (or as long as possible) at their current employer (current job).

Figure 7 shows whether or not respondents "want to work at their current employer until they reach mandatory retirement age (or as long as possible)." Regardless of their marital status or sex, respondents' intention to continue working at their current job increases with age. It is natural for people to want to continue working at their current company once they reach the age when their mandatory retirement is in sight. Looking at differences between unmarried and married men, the intention to continue working at their current jobs gradually increases with age for those who are married. However, for those who are unmarried, it increases sharply to 78.6% at age 55 or older. In the case of women, the intention to continue working at their current jobs increased significantly with higher ages for both unmarried and married respondents. Among respondents aged 30 and above, the intention to continue their employment is higher for married women than for unmarried



Source: JILPT (2021): 126.
Note: Although not shown in the graph, the relation between age group and intention to continue in current employment is χ^2=135.1***.

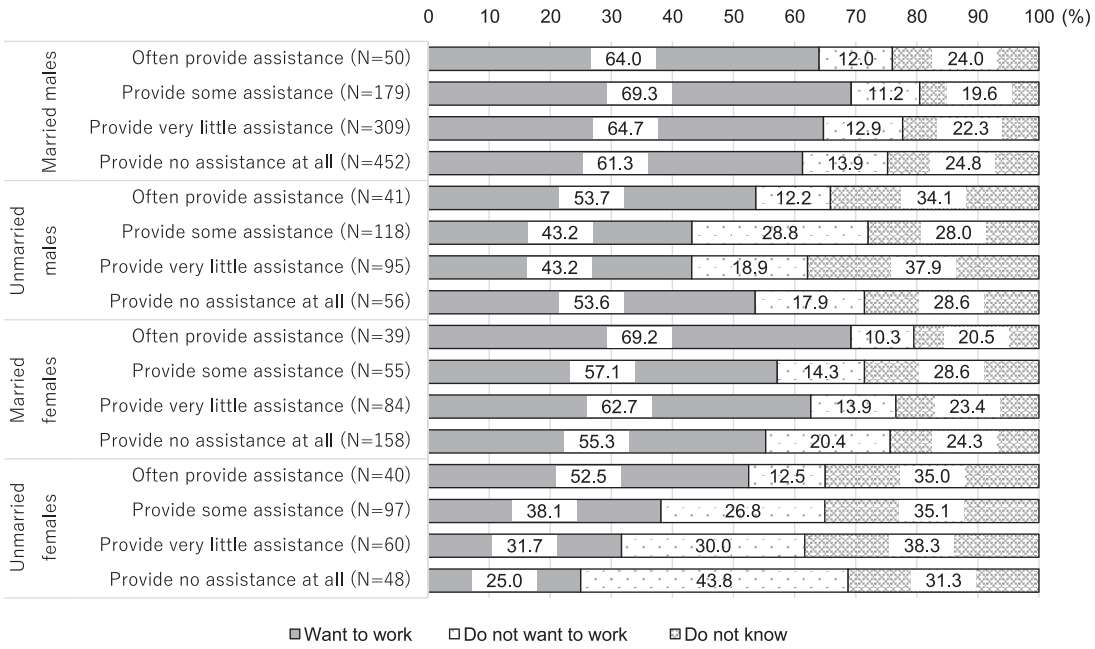
Figure 7. Job-continuation intentions of current regular employees by sex, marital status, and age group

women.

From the above, it can be surmised that married respondents desire stable employment in relation to their family responsibilities, such as their breadwinner role or family caring role. On the other hand, unmarried men "up to middle age" who have limited responsibilities and are highly regarded as human resources are free to think about changing jobs and advancing their careers, but then desire to stay in the internal market after a certain age. In the case of unmarried women, although they too have limited responsibilities, it is probably more difficult for them to secure an advantageous job change in the external labor market as they get older than for men, and therefore their intention to stay in the internal labor market rapidly increases with age. Combined with the aforementioned results concerning intention to continue working long term are taken into account, it is apparent that a relationship exists between family responsibilities and intention of long-term continued service, and that unmarried people are more likely to aspire to a more fluid work style but may encounter age constraints.

Next, let us look at the effects that taking care of parents and nursing care have on respondents' desire for long-term continued service in their current jobs. Figure 8 shows the relationship between the level of assistance (care)[9] provided to a mother and intention to continue working at current job. Respondents' intention to continue with their current jobs is higher when they often provide assistance. This relationship is more pronounced among unmarried women. Looking at instances in which a parent receives assistance in daily living or requires nursing care, if the mother is healthy, she is the primary caregiver for the father and the children will assist the mother. However, when it comes to caring for the mother, in many cases, it is an unmarried woman living in the household, rather than the father, that is expected to provide care. It is therefore thought that unmarried women's intention to continue at their current jobs rises so that they can take advantage of the benefits of being a regular employee.

In summary, it can be said that even as women begin pursuing their own careers, the link between long-term employment and the marital relationship based on gender roles remains strong. On the other hand,



Source: JILPT (2021) :135.
Note: Although not shown in the graph, age group × intention to continue in current employment n.s. (no significant difference), unmarried males only (second group from the top in the graph) χ^2=11.9** and unmarried females only (bottom group in the graph) χ^2=17.8***.

Figure 8. Job-continuation intentions of current regular employees by sex, marital status, and nursing care role for mother

unmarried people who are not participants in such a relationship find that their lives do not mesh with long-term employment, and thus their employment is becoming more fluid. It could be argued that differentiation into the long-term employment group and the fluid employment group is occurring, not only in terms of industry but also of family life. In addition, the fluid employment of unmarried people can also be seen as a sign that those people are lagging in planning their lives, including supporting and caring for their elderly parents. Although unmarried people do not have families that were formed by marriage, it is important to help them combine work and family life, keeping in mind that they may have responsibilities to the families in which they were born and raised.

2. The quality of fluid employment

(1) An expanding secondary labor market?[10]

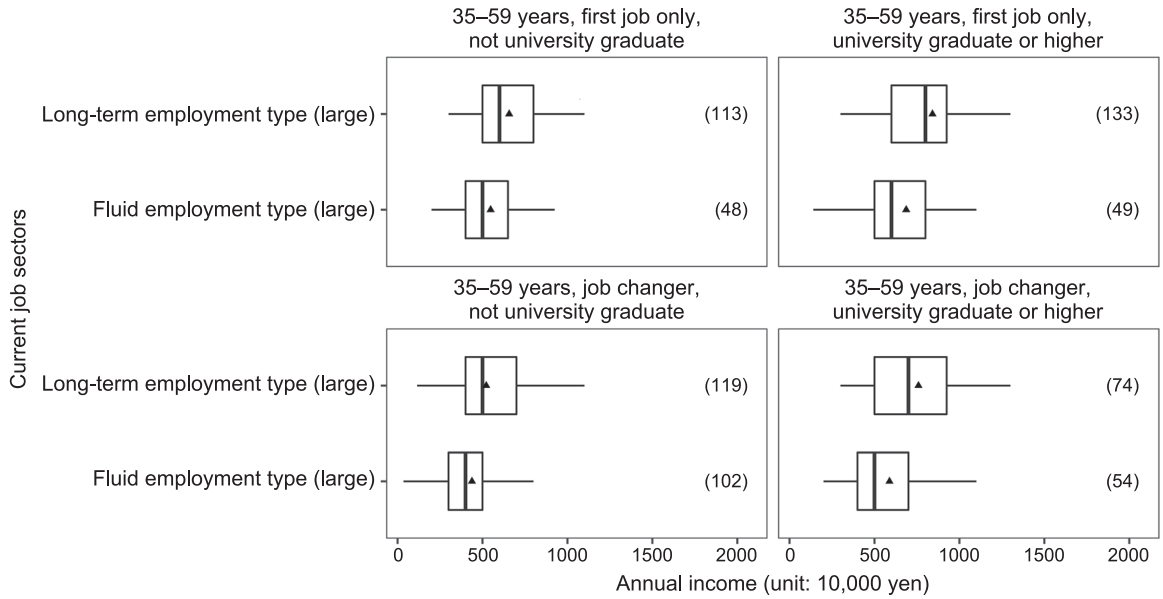
From former sections, which examined the labor market's employment system with focus on workers' career patterns, we learned that fluid employment is occurring in the service industry and among unmarried women and others against a backdrop of post-industrialization and increasing number of unmarried people. Here, we examine the question of whether this fluid employment can serve as an alternative to long-term employment.

In Japan's labor market, where post-industrialization and a tendency toward remaining unmarried are advancing, two employment system sectors—the long-term employment sector and the fluid employment sector—exist side by side. However, if the latter sector's employment and jobs are not of high quality compared to those in the former sector, then fluid employment is not something that can be accepted outright. In fact, a previous study pointed out that much of the broadly defined service industry, which is included in the fluid employment sector, tends to have poor "job quality," such as low wages (Nagamatsu 2016). On the other

hand, for example, even in the manufacturing industry, which is representative of the long-term employment sector, there has been a noted flattening of the seniority-based wage curve in recent years (Kawaguchi, ed. 2017) and the benefits of "deferred wages," namely, higher wages paid later in career, which assume long-term continued service are also declining. Today, the relationship between remuneration and such factors as length of continued service and age is becoming relatively weaker. As it does, fluid employment in the form of changing jobs in search of internal fulfillment, such as job motivation and satisfaction, may be more desirable from the standpoint of career development. Therefore, when assessing the impact of fluid employment on Japan's employment society, which has been premised on long-term employment, it is important to examine the quality of jobs and the characteristics of how people work (i.e., ways of working) that come with such fluidity.

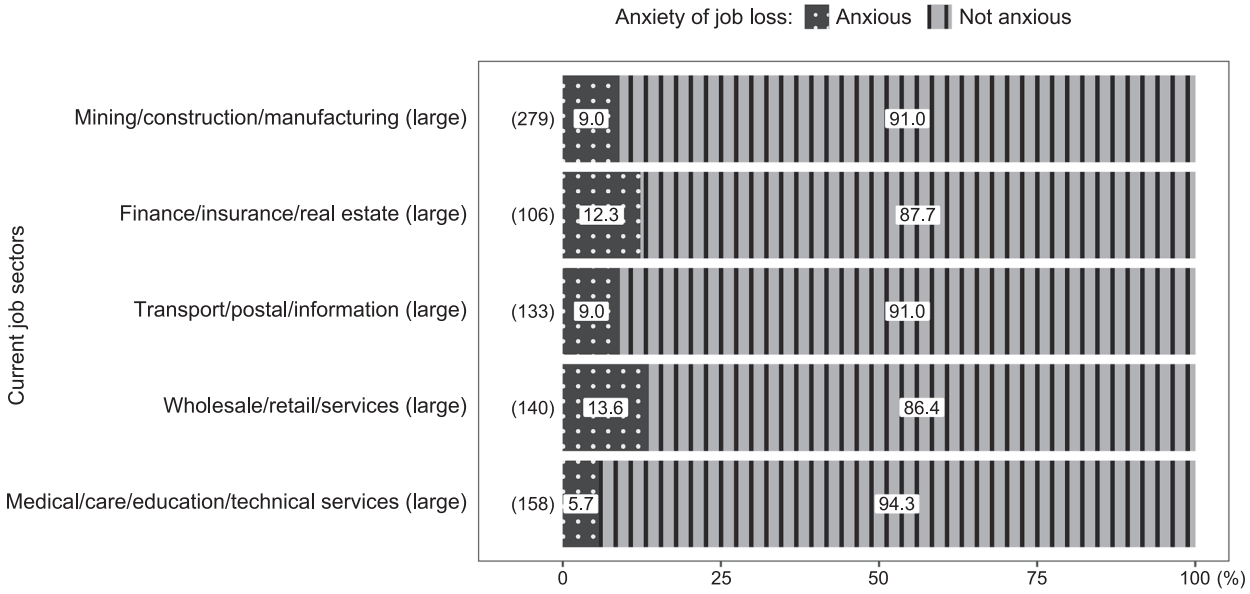
Here, we use the above discussion as the basis for examining the quality of jobs and characteristics of ways of working in the long-term employment sector and the fluid employment sector. We focus on income as a measure of job quality and on anxiety of job loss and job satisfaction as characteristics for ways of working.

First, we provide a comparison of annual personal income by industrial sector in Figure 9. It can be seen that annual income is higher in the long-term employment sector and, as is pointed out in previous studies, lower in the fluid employment sector. This trend is not dependent on whether the worker's career is a continuation of his or her first job or whether the worker has changed jobs, as income is consistently higher in the long-term employment type. On the surface, one might assume that a career that is a continuation of a first job would have an advantage in the long-term employment type, while a career with job changes would have an advantage in the fluid employment type. In actuality, however, the long-term employment type has an advantage in terms of income regardless of the employment sector type. In light of this result, we must deem the advancement of fluid employment to be an expansion of the secondary (subordinate) labor market, rather than an alternative to long-term employment, in the sense that it leads to more low-income employment and jobs.



Source: JILPT (2021): 71.
Note: The triangles in the figure indicate the average value, the left side of the box indicates the first quartile, the right side indicates the third quartile, and the thick line in the center indicates the second quartile (median). The whiskers on the sides indicate the first quartile from the smallest value and the third quartile from the largest value, respectively.

Figure 9. Individual annual income by career/academic background and by sector



Source: JILPT (2021): 61.

Figure 10. Anxiety of job loss by industry

If the employment and jobs available in the fluid employment sector are not of good quality, then naturally some aspects of the ways of working in that sector will also be lacking in quality. Low income, in particular, may lead to employment instability and a lower sense of personal fulfillment. Surprisingly, however, Figure 10 shows that workers in the fluid employment sector are not necessarily experiencing poorer ways of working. To be sure, only a small number of people (about 10%) feel anxiety of job loss overall, and the level of such anxiety is the highest in the "wholesale and retail trade; accommodations, eating and drinking services; amusement services; services, N.E.C." sector at about 13%. However, this differs by only about one percentage point from the value for anxiety of job loss in the "finance and insurance; real estate and goods rental and leasing" sector, which is included in the long-term employment sector. In fact, anxiety of job loss is lowest in "medical, health care and welfare; education, learning support; professional and technical services," and there is no apparent connection in the sense that simply being in the fluid employment sector leads to higher anxiety of job loss.

To conclude, although we can say that the fluid employment sector is an alternative for workers in a subjective sense, in reality, it is a circulating-type secondary labor market. In particular, it is important to note that careers involving job changes in the fluid employment sector do not lead to increases in income. This indicates that the employment fluidity (i.e., job changes) that is currently being observed is not a spiral type of upward mobility, but rather a circulating type whereby people move around within similar economic positions.

(2) Job changes and wages[11]

In the previous section, we saw that opportunities to increase wages by changing jobs are not very abundant. This is true not only in the long-term employment sector but also in the fluid employment sector. Indeed, previous studies have pointed out that, in many cases, wages decrease due to job changes. Particularly in Japan, where the labor market within companies is well-developed, stress is placed on the formation of firm-specific human capital, primarily through on-the-job training, under long-term employment contracts. Consequently, once a person changes his or her job, the skills he or she accumulated in the past tend to become obsolete or "sunk cost" and job changes are unlikely to lead to higher wages. This is a reason why changes in

Table 3. Determinants of task distance

Main independent variables	Dependent variable: Task distance								
	Males only			Females only			Regular employees only		
Years of experience at time of job entry	**-0.003**	(0.001)	**	-0.001	(0.001)		**-0.003**	(0.001)	**
Years of experience at time of job entry squared	0.000	(0.000)	†	0.000	(0.000)		**0.000**	(0.000)	+
Current job (reference: Professional and technical works)									
Management	0.016	(0.011)		**0.016**	(0.010)	†	**0.016**	(0.010)	†
Clerical work	**0.044**	(0.012)	**	**0.012**	(0.007)	†	**0.019**	(0.007)	**
Sales work	0.012	(0.013)		**0.022**	(0.009)	*	**0.027**	(0.010)	**
Service work	**0.032**	(0.019)	†	**0.030**	(0.008)	**	**0.030**	(0.010)	**
Security work	**0.036**	(0.021)	†	**0.109**	(0.026)	**	**0.054**	(0.023)	*
Agriculture, forestry, fishery work	-0.004	(0.030)		-0.053	(0.018)		0.016	(0.024)	
Manufacturing process work	**0.025**	(0.014)	†	**0.051**	(0.012)	**	**0.039**	(0.012)	**
Transport and machine operation work	**0.039**	(0.015)	**	0.022	(0.052)		**0.048**	(0.015)	**
Construction and mining work	0.021	(0.016)		**0.033**	(0.017)	†	**0.025**	(0.015)	†
Carrying and cleaning work	**0.027**	(0.017)	†	**0.044**	(0.012)	**	**0.050**	(0.014)	**

Source: Main results are extracted from the Models (5) to (7) in Figure 4-3-5 of JILPT (2021): 89.

Note: The figures in parentheses are robust standard errors. Years of continued service in previous job, female dummy, academic background dummy, previous and current employment type dummy, and year of current job entry dummy are controlled. **<0.01, *<0.05, †<0.1

employment are typically disadvantageous.

On the other hand, if a worker's skills are transferred through a job change in an appropriate manner, then the change does not necessarily lead to a disadvantage in terms of lower wages. For example, it has been pointed out that even in job changes that occur between companies, the efficiency of skill transfer is relatively high among professional and technical workers and the cost of changing employment is small (Higuchi 2001). Furthermore, previous studies have noted the possibility that occupation-specific labor markets are formed based on the premise that there are skills unique to each individual occupation and that workers' skills are unlikely to become obsolete in job changes within the same occupation.

As observed above, studies conducted thus far have represented the transferability of workers' skills in job changes as the degree of similarity between a worker's occupation before the job change and that after the job change. However, some workers' skills may be transferable even when moving to different occupations. To precisely examine the advantages and disadvantages that are associated with job changes, it is necessary to grasp the cases of job changes in which the worker skills are transferable by applying a concept of finer detail than "occupation."

We therefore quantitatively ascertain changes in job content before and after a job change using the concept of "task" and then examine the impacts that these changes have on changes in wages. Here, "task" is a basic unit of labor activity that generates production and services. Production is realized only when the skills workers possess are applied to tasks. (Acemoglu and Autor 2011). The survey quantified respondents' normal work content with respect to their current and previous jobs by using 23 task items. By comparing the task groups of job changers' current and previous jobs, it becomes possible to quantify the change in job content (i.e., the "task distance") in each job change. Naturally, in job changes where the change in job content is small (i.e., the task distance is narrow), worker skill transferability is considered to be high, and therefore wage decreases should also be suppressed.

We found as a result of a descriptive analysis that, first, there are many job changes with a narrow task distance. Secondly, we found that there are also job changes between occupations with a narrow task distance (figures and tables are omitted). Most of the actually observed job changes have a narrow task distance, as it can naturally be assumed that workers' job change behavior is more likely to materialize when the change in

Table 4. Relationship between task distance and wage change

Dependent variable: Current job wage rate — previous job wage rate (both transformed to natural logarithm)

Key independent variables	Model 1	Model 2	Model 3	Model 4
Task distance	**-0.474** (0.236) *			-0.435 (0.280)
Job change in same occupation dummy		0.048 (0.040)		0.014 (0.047)
Job change in same industry dummy			0.037 (0.039)	0.001 (0.044)

Source: Main results are extracted from the Models (2) to (4) and (6) in Figure 4-3-8 of JILPT (2021): 91.

Note: Figures in parentheses are robust standard errors. Female dummy, academic background dummy, current job occupational classification dummy, years of continuous service in previous job and current job, previous and current employment type dummy, and year of current job entry dummy are controlled are controlled as other explanatory variables. *p<0.05

job content is small. Additionally, in general, even if a job change is between occupations, the task distance tends to be narrower if the change is within the same broad occupational classification. Thus, changing to a different occupation does not in itself necessarily bring about a large change in job content.

Next, we analyzed the determinants of task distance at the time of job change. Here, we found that the more experienced a person is (i.e., the more years of experience he/she has), and the more professional or technical the job is, the narrower the task distance tends to be at the time of job change (Table 3). The coefficients for the number of years of experience at the time of job entry are curved in a "U" shape with the bottom at about 30 years. The task distance is narrowest for job changes when the employee has about 30 years of experience at the time of job entry. Most of the coefficients for the occupational categories are significantly positive, and the task distance tends to be wider for other occupations than for "professional and technical works." These results suggest the possibility that occupational labor markets exist. They also suggest that, when people have more years of job experience, they are more likely to engage in job changes with narrower task distances so as to suppress obsolescence of their skills due to the job change.

Lastly, we analyzed the relationship between task distance and wage change at the time of job change. We found that while wages tend to decrease with job changes having wider task distances, the fact that a job change is within the same occupation or the same industry does not have a major impact on wage change (Table 4). The coefficient of task distance in Model 1 is significantly negative, and the difference between the wages of the current job and previous job decreases as the task distance at the time of job change widens (i.e., it takes a larger absolute value in the negative direction). Although the task distance coefficient is no longer significant in Model 4, its absolute value does not change considerably and has a larger effect than the other variables. In other words, it is not the similarity of the occupation or industry before and after a job change in itself that is important. Rather, the fact is that wage decrease at the time of a job change is more suppressed when the change in job content is smaller in terms of tasks.

From the above results, we can say fluidity in the form of job change is not disadvantageous in itself. The reason why job changes do not lead to wage increases—not only in the long-term employment sector but also in the fluid employment sector—is that job changes which currently take place do not sufficiently transfer workers' skills in terms of task continuity. Nevertheless, at first glance, the findings in this section—specifically, that task distance is narrow in many of the observed job changes and that wage decreases are suppressed when task distance is narrow—seem to contradict the previous chapter. However, what is important to remember with respect to this section is that the narrowness of task distance suppresses wage decreases at the time of job change, not that it increases wages. After all, it is undeniable that changing employment results in loss under the Japanese employment practice. However, even so, the loss resulting from job change tends to be suppressed if the distance between tasks is narrow and thus the change in job content is small. In a labor market expected to see greater job fluidity in the years ahead, it is important to develop opportunities' settings for the formation of skills that can be transferred across the boundaries of companies and occupations (i.e., "transferable skills").

V. Summary and conclusions

We examined where long-term employment is being maintained and where it is collapsing within contemporary Japanese society, in which the non-manufacturing sector is expanding and the number of unmarried people is growing. We also studied whether the fluid employment that is emerging as a result will lead to the expansion of high-quality employment opportunities for people in regular employment. The key points of our analysis's findings are as follows.

(1) Even among large non-manufacturing enterprises, "finance and insurance; real estate and goods rental and leasing," "transport and postal activities; information and communications" show a tendency toward long-term continued service that is similar to that of secondary industries such as manufacturing, etc. However, in the service industry, the first job continuity rate is low and there is great job mobility. Job changes between the "long-term employment sector" and "fluid employment sector" are few, suggesting that two kinds of labor markets coexist.

(2) Women were not eligible for long-term employment, but the younger generation is gradually continuing to work for first-time companies. However, a tendency is seen whereby married women stay with their companies while unmarried women have more employment mobility. Nevertheless, the inclination to stay with their companies also rises among unmarried women when they begin assisting elderly parents.

(3) The gap between the fluid employment type and the long-term employment type is not large in terms of anxiety of job loss. However, the fluid employment type has lower wage levels than the long-term employment sector and does not appear to have good opportunities to earn higher wages through job changes.

(4) When "tasks," which constitute a work unit smaller than "job" and "duty," are similar, it is possible to change jobs without suffering disadvantages in terms of wages.

These results suggest the following implications for future labor policy: (a) Long-term employment is being maintained as a safety net even in the non-manufacturing sector; (b) However, fluid employment type is also growing as fewer people get married and the economy becomes more service-oriented (post-industrialization); and (c) The development of transferrable skills based on tasks (i.e., skills that can be carried across companies) is effective in helping people find good employment opportunities and change jobs.

The fluid employment identified in this study has a strong circulating-type character, as there are few opportunities for upward mobility through job changes and human resources simply circulate in the labor market. Even in the service sector, where fluid employment is conspicuous, it is relatively more advantageous to be a long-term employee than to change jobs. However, the long-term employment seen there strongly connotes a sense of "safety net," and long-term employment as an economic activity within the industrial structure is on the decline. To create an economically vital employment society, it will be important to link long-term employment that serves as a safety net to economic activity in the form of diversity management, and also to build a spiral-type market for job changes in which fluid employment leads to upward mobility.

This paper is based on "*Choki koyo shakai no yukue: Datsukogyoka to mikonka no kiketsu*" [The Future of the Japanese Long-Term Employment Society: The Consequences of Post-Industrialization and Increase of Unmarried Workers], JILPT Research Report no. 210 (March 2021, in Japanese).

Notes

1. OECD (1972) considered the Japanese employment system and long-term employment practice to be the driving force behind Japan's rapid economic growth. Vogel (1979) likewise considered these attributes to be the main pillars supporting "Japan as Number One." It should be noted that the term "long-term employment" does not refer to the years of continued service as a continuous variable. Instead, it refers to the length of time a person continues to work for the same company from the time of his or her hiring as a new graduate until retirement—in other words, for his or her entire professional life. Other elements of the Japanese employment system

include a seniority-based wage system and labor unions organized on a company-by-company basis. It has been said that a strong sense of unity between a company and its employees, which arises from the generous livelihood security that the system provides mainly to male workers, forms a "corporate community" (Hazama 1996, Inagami 2005, JILPT 2017).

2. See Takahashi, Koji (2017) "The Future of the Japanese-style Employment System—Continued Long-term Employment and the Challenges It Faces," JILPT Research Eye no.25 for a summary of this paper. https://www.jil.go.jp/english/researcheye/bn/RE025.html.

3. Sections I, II, III, and V of this paper were written by Ikeda, section IV–1 was written by Sakai, and section IV–2 was written by Tagami. JILPT (2021), upon which the paper is based, was written by Kazufumi Yugami (Professor, Kobe University), Kaoru Ookaze (Associate Professor, Kyoto Notre Dame University), and Tomohiro Takami (Vice Senior Researcher, JILPT) in addition to the authors of this paper.

4. Sugeno (1996) and Inagami (2005) are among prior studies that discuss employment issues in a way that questions the nature of the employment society, not just the personnel and labor management of individual companies.

5. This section is based on Chapter 1 (written by Kazufumi Sakai) and Chapters 2 and 3 (written by Kota Tagami) of JILPT (2021).

6. For people who became regular employees in their first job, we focused on those who were born between 1960 and 1989 and are working at the time of the survey (November 2019) in order to exclude those who entered employment immediately after graduation and just began their careers and those who changed jobs after reaching the age of mandatory retirement.

7. Note that the analysis here is based on a survey of individuals and does not strictly look at mid-career hiring by enterprises.

8. This section is based on Chapter 5 (written by Kazafumi Sakai) and Chapter 7 (written by Kaoru Okaze) of JILPT (2021).

9. As a general trend, the percentages of respondents who assist (care for) their mothers rise with higher age groups in all categories.

10. This section is based on Chapter 3 (written by Kota Tagami) of JILPT (2021).

11. This section is based on Chapter 4 (written by Kazufumi Yugami) of JILPT (2021).

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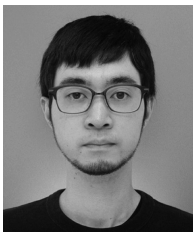
IKEDA Shingou
Senior Researcher, The Japan Institute for Labour Policy and Training (JILPT).
https://www.jil.go.jp/english/profile/ikeda.html

TAGAMI Kota
Researcher, The Japan Institute for Labour Policy and Training.
https://www.jil.go.jp/english/profile/tagami.html



SAKAI Kazufumi
Research Associate, The Japan Institute for Labour Policy and Training.

Why Do Firms Concentrate in Tokyo? An Economic Geography Perspective

MIZUNO Masahiko

The causes of firms concentrating in the Tokyo region can be broadly divided into two factors. The first factor is the existence of agglomeration economies. While the benefits of agglomeration are based on three sources– that is, sharing, matching, and learning – learning is especially important in the age of the knowledge economy. Geographical proximity facilitates the learning of sticky knowledge through face-to-face contact. In addition, knowledge spillover is thought to be constrained by geographical distance. On the other hand, if the degree of agglomeration increases, agglomeration diseconomies, such as congestion and rising land prices, can occur. It is important to note that current policy discussions tend to downplay agglomeration diseconomies, although they emphasize that urban density increases productivity. The second factor is the city's attributes. Overconcentration in Tokyo is considered to be partially due to the decline in the economic status of the Osaka region. The difference between Tokyo and Osaka is partly explained by which industries they specialize in. Since path dependence greatly affects which industry a city specializes in, it is necessary to consider not only the size and density of cities but also the historical paths and geographical context when we consider regional policies.

I. Introduction

Overconcentration of economic activity in the Tokyo region has long been regarded as a problem in Japan. The author specializes in a field of geography known as economic geography, and this article examines the phenomenon of overconcentration in Tokyo from an economic geography standpoint. Economic geography shares many concepts and tools with economics and the two fields are not necessarily in conflict, but it differs from mainstream economics in that it emphasizes geographical context and historical paths.

In terms of economic geography and economics, the causes of firms overconcentrating in the Tokyo region can be broadly divided into two factors. The first factor is the existence of agglomeration economies caused by dense clustering of people and firms. It is assumed that efficiency and productivity rise as the density and scale of firms increase. Simply put, if there are more benefits to concentration of people and firms, or agglomeration economies, people and firms will move from rural areas to cities, and from smaller cities to

larger ones. This results in concentration in and around Tokyo, the densest and largest agglomeration in Japan, and the decline of rural areas where population is low and firms are sparse.

The second factor consists of the city's attributes, such as industrial structure. Differences in cities' attributes widen regional disparities in per capita income and growth rate, resulting in concentration in specific cities. For example, new industries such as the tech sector are highly productive and their workers earn high incomes. This creates demand for personal services and has a spillover effect. On the other hand, in areas where new industries are not located and economies depend on old industries, incomes decline due to reduced employment. The latter factor explains concentration in specific cities, not just concentration in major urban areas in general.

Section II summarizes discussions on the first factor, agglomeration economies. Section III summarizes discussions on the second factor, differences in cities' attributes, and the final Section IV critically examines evaluation of overconcentration in Tokyo and the policies derived therefrom.

II. Agglomeration economies and diseconomies

1. What are agglomeration economies?

This section examines the phenomenon of agglomeration economies, a factor that attracts people and firms to specific places. The pioneering discussion of agglomeration economies was by economist Alfred Marshall (1890), and Marshall's arguments were summarized by the urban economists Duranton and Puga (2004) with three words: sharing, matching, and learning. We will consider these three terms below.

First, "sharing" refers to, for example, the shared use of infrastructure and facilities to reduce unit costs. Alternatively, it is possible to reduce costs by sharing related industries such as suppliers. However, here sharing is not limited to these meanings. Relationships among people and firms within agglomeration, i.e. social networks, are also shared, and by joining such networks it is possible to gain significant advantages over others. While these advantages are difficult to quantify, the economic geographer Storper (2013) calls these social networks "relational assets" and states that sharing them is an advantage of being located within the agglomeration. And it has the effect of facilitating the acquisition of knowledge, as will be described later.

The second benefit, "matching," can be grasped through the following example. The greater the number of workers and employers, the more possibility of better employment relationships could be seen among workers with diverse skills and employers with diverse needs. Being in a region with a richer labor market benefits both workers and employers. Similarly, this principle can be applied to compatibility between consumers and the producers, sellers and providers of goods and services. Consumers with diverse tastes can all find satisfaction in regions of home to diverse producers and sellers. By the same token, in regions where there are many consumers with diverse tastes, a variety of products and services can find markets.

The third benefit, "learning," is especially important in the age of the knowledge economy. Consider cases in which knowledge is transferred from one party to another. First, it is assumed that knowledge is transferred in a cooperative relationship to which both parties agree. In this case, geographical proximity makes it easy to have frequent face-to-face contact, thereby forming a relationship of trust. This relationship of trust further promotes mutual transfer of knowledge. If knowledge transfer is possible over long distances, then knowledge can be transferred without regard to location (whether in Tokyo or Japan's peripheral regions), and geographical proximity is not important. However, knowledge transfer can be carried out most efficiently and effectively by face-to-face contact, and there remain forms of knowledge that cannot be fully conveyed through communication consisting only of text or voice without sharing the location. This is referred to as "stickiness of knowledge", and geographical proximity is important for transfer of knowledge with high stickiness. Also, acquisition of knowledge arises through interfirm relationships and social networks of people. We can expect learning of knowledge to be vitalized in cities where there are many of the relational assets described above.

In addition to transfer of knowledge based on agreement between two parties, there are cases where

knowledge unintentionally leaks to other parties. For example, it may be possible to imitate others to some extent by listening to rumors people spread or by observing nearby rival firms. This is described as knowledge spillover. It occurs because, unlike goods, knowledge has the properties of nonrivalness (it can be possessed by many people simultaneously) and nonexcludability (people cannot be excluded because they have not paid for it). Certainly, knowledge may be appropriable via patents, but this applies only to a small and limited subset of knowledge and it is difficult to completely eliminate spillover. This knowledge spillover is described as a market externality in that it makes something available at no cost, rather than through the market. It has been pointed out that spillover is subject to geographical distance constraints, which contributes to agglomeration economies. Marshall (1890) says of regions where an industry is clustered, "The mysteries of the trade become no mysteries but are as it were in the air." Knowledge spillover may be negative for firms that have leaked their knowledge, but it has a positive effect on the entire region, such as by increasing the productivity of other firms in the region.

As we have seen, the constraints of geographical distance on learning, whether intended or unintended, have led to vital agglomeration economies in the current age of the knowledge economy era. It is true that knowledge spreads over time due to the spillover effect, but sticky knowledge tends to spread at a slower rate. Because the difference in speed plays a decisive role among the interfirm competition in the market, firms locate themselves in regions of agglomeration in pursuit of access to novel and valuable knowledge.

2. Localization economies and urbanization economies

Agglomeration economies can be further classified as "localization economies" or "urbanization economies." "Localization economies" refers to the concentration of specific industries in a region, and there are said to be benefits such as the presence of related industries and the spread of related knowledge in the vicinity, as described above.

Meanwhile, "urbanization economies" describes economies that benefit from agglomeration of diverse industries. The presence of diverse industries in one city gives rise to benefits through sharing of various infrastructure and services (e.g. airports, roads, hospitals, etc.) and markets (e.g. consumers, etc.). Also, if a region is particularly reliant on a specific local industry, there is risk in that if demand for the industry shrinks due to changes in the external economic environment, the region will be strongly affected and unemployment rates will rise. In cities with diverse industries, such risks exist only fragmentarily and the impact of a shrinking industry can be absorbed to some extent by other industries, meaning the urban economy is considered relatively stable.

Furthermore, while reliance on a specific industry causes accumulation of knowledge relating to that industry within the region, there is a risk that new knowledge outside the bounds of that industry will not enter. To acquire new knowledge it is advantageous for various industries to exist in the region, and this can be called an urbanization economy from the standpoint of knowledge acquisition. However, while diversity is preferable, there is a strong possibility that knowledge cannot be mutually understood and absorbed among completely unrelated industries. Effective knowledge transfer is more likely to occur between industries that are related to some extent and play complementary roles. In terms of innovation, it is preferable to have "related variety" among industries that are neither uniform nor completely different (Boschma and Frenken 2011, Mizuno 2011, 2018).

In general, cities geared toward specific industries tend to be small and medium-sized, while cities with diverse industries tend to be larger. If industrial diversification is desirable for the creation of new knowledge and innovation, it is assumed that the larger the city, the larger agglomeration economies will be in that sense.

Based on the above discussion of agglomeration economies, we can infer that the more people and firms cluster together, the more benefit will rise,[1] which will bring about further agglomeration, meaning that major cities will continue growing larger. On the other hand, we can predict that rural areas and smaller cities inevitably stagnate or decline. These agglomeration economies can explain to some extent present-day Japan's

concentration of economic activity in Tokyo, as well as the population decrease in small and medium-sized cities and rural areas of Kyushu while the population is increasingly concentrated in Fukuoka City.

3. Agglomeration diseconomies

Assuming that there are only benefits to agglomeration, large cities will continue to expand indefinitely. In reality, however, agglomeration can bring not only advantages but also disadvantages. "Agglomeration diseconomies" include rising land prices and wages, traffic congestion, pollution and environmental degradation. The existence of these disadvantages means that in actual terms, cities will not necessarily expand indefinitely.

In the 1970s, when pollution and overcrowding were regarded as significant problems in large Japanese cities, attention was focused on such agglomeration diseconomies. Also, it was an era when the trend toward concentration in major cities was relatively weak. Prior to that, during the rapid economic growth period of the 1960s, the highly productive heavy chemical industry was concentrated in Japan's three largest urban areas (Tokyo, Nagoya, and Osaka). These coastal industry zones formed industrial complexes that shared equipment and infrastructure, and were able to take advantage of the reduced costs and high efficiency of agglomeration economies. In general, industrial agglomeration also causes the disadvantage (from businesses' standpoint) of rising wages, but at the time there was a large influx of baby boomers from rural areas into the three major urban centers, and wages were kept low. However, in the 1970s the influx of labor from rural areas decreased due to declining birthrates, and labor shortages emerged in major urban areas. This led to higher wage levels that became a significant problem for the manufacturing sector, which seeks a workforce that works diligently for relatively low wages. Under these circumstances, dispersal of factories to the peripheral regions of non-major cities progressed from the 1970s to the 1980s.

One factor that made it possible to disperse factories into peripheral regions was the highway network that spread nationwide with its central node in Tokyo, and another was the advancement of spatial fragmentation of the production process. This made it easier to locate specific processes in different geographical locations. Manufacturers, exemplified by producers of consumer electronics such as audio equipment, transferred simple, unskilled processes to peripheral regions, while divisions requiring advanced skills, such as research and development and prototyping, remained in major urban areas (Matsuhashi and Togashi, 1988). Until the rapid economic growth period, industry was geographically divided, with manufacturing in large cities and agriculture, forestry and fisheries in peripheral regions. On the other hand, from the 1970s onward manufacturing came to be located in peripheral regions, and division of labor according to process came to be the norm.[2]

This created non-agricultural jobs in rural areas from the 1970s and early 1980s, and played a role in curbing migration to major urban areas. However, it was only simple tasks commanding low wages that were transferred, and these worksites were limited in that they lacked decision-making and R&D functions, leading Ando (1986) to describe the phenomenon as "growth without development." And as long as low wages were a factor in selecting locations, offshoring of processes to lower-wage countries was only a matter of time.

The primary drivers of full-fledged relocation of factories to other Asian nations were appreciation of the yen starting in 1985 and labor shortages during Japan's economic bubble period. Then, during the prolonged recession of the 1990s, more production sites were relocated to Southeast Asia and China in order to cut production costs in response to increasing consumer expectations of low prices. This resulted in excessive production capacity, which was resolved through a growing number of closures of relatively high-cost factories in Japan. In peripheral regions such as Tohoku, where many factories were located up until the 1980s, workforces were downsized due to the closure of factories. Many of the factories in peripheral regions that survive today have made some kind of qualitative improvement beyond simple labor-intensive processes, but in general manufacturing's role in providing large-scale employment has weakened. Of course many factories in major urban areas, especially small to mid-sized operations, were also closed or downsized, but in these major urban areas, especially Tokyo, the impact could be alleviated by shifts in function to R&D and the

service sector. This has led to an ever-widening gap between greater Tokyo and peripheral regions.

4. Overconcentration of service industry in Tokyo and agglomeration diseconomies

Since the 1970s manufacturing, especially non-R&D production processes, has been declining in large cities, while the service economy has advanced. Especially since the 1990s, when Japanese manufacturing increasingly shifted overseas, the service industry was further concentrated in large cities, especially in Tokyo. Specifically, producer services have accumulated in Tokyo. Face-to-face contact is important because these services are basically difficult to transport and store, making it an industry strongly affected by agglomeration economies.

The service industry does not require as much space as manufacturing, but it is still affected to some extent by agglomeration diseconomies. If the required office space and demand for workers increase, it is inevitable that the costs will increase due to higher land prices and wages. However, the overconcentration of producer services in Tokyo has in fact continued accelerating since the 2000s. Next, let us examine the types of agglomeration diseconomies and how firms have responded to them, by dividing agglomeration diseconomies into those related to land and those related to labor.

(1) Land-related agglomeration diseconomies: Rising land prices

First, land-related agglomeration diseconomies include high land prices and traffic congestion as a result of competition for limited land supply. Regarding land shortages, one solution is to increase the height of buildings. Since the 2000s, floor area ratio regulations have been relaxed under the national government's urban renewal policy, and redevelopment taking advantage of this deregulation has been actively carried out especially in central Tokyo. Also, land was made available in the city center due to closure of factories accompanying the decline of manufacturing, the conversion of freight yards, and the sale of company housing due to firms' cutting of employee benefits, which brought about a rush to construct office buildings and high-rise condominiums. Underlying the urban renewal policy were measures against falling land prices to solve the problem of non-performing loans in the 1990s, and it is certain that declining land prices due to the bursting of the economic bubble made it easier to live in apartment buildings in central Tokyo. However, land prices began to rise again with growing demand for office space and housing since the 2000s. Increased demand for land and rising land prices are certainly in the interest of landowners. However, rising land prices are detrimental to land users, and housing near the city center is costly whether buying or renting. This shortage of affordable housing is one of the agglomeration diseconomies. However, the burden of home-buying and rent payment is on workers, and does not have a major impact on the location decisions of firms. From another perspective, it means that benefits generated by agglomeration in cities accrue to landowners rather than workers (Hatta and Tabuchi 1994), which has brought about a wealth disparity between landowners and non-owners.

In addition, expansion of office space in the city center leads to an increase in the number of employees and is accompanied by congestion of commuting routes. The stress of congestion is, like housing costs, a burden borne by workers, and unsurprisingly it did not stop firms from locating in the city center. In Tokyo, infrastructure development such as the opening of new subway lines has been carried out as a measure against congestion, but this in turn inevitably results in further concentration.

Meanwhile, excessive concentration in Tokyo also has a negative effect on population demographics. Long commuting times and lack of daycare centers for children make it difficult to raise children while working. Masuda (2014) focuses on this issue in a discussion of "local extinction." While more women of child-bearing age move into major urban areas from elsewhere, the total fertility rate is low in large cities due to difficulties in raising children while working (Sato 2019). Outside major urban areas, the number of births falls due to the decreased number of younger women, while in large cities, the number of young women increases but birth rates are low, meaning the total number of births in Japan decreases. This is the mechanism behind Japan's declining birthrate pointed out by Masuda, who argues that neglecting the migration of young people to major

urban areas hinder the reproductive function of Japanese society. However, because declining birthrates are outside the scope of market transactions, they are not included in analyses of improved productivity in agglomeration economies.

(2) Labor-related agglomeration diseconomies: Rising wage

As mentioned above, during the rapid economic growth period there was a supply of low-wage labor due to a large influx of workers from rural areas, but after this period the flow of labor from rural areas began to dwindle. Although population migration to Tokyo continues even now, in recent years migration to the Tokyo area is characterized by a high percentage of women and highly educated people (Nakagawa 2005). The reason is that outside major urban areas there is a lack of jobs commensurate with the skills of the highly educated people, but it goes without saying that the outflow of highly educated people is highly detrimental to areas outside major urban centers. This is because these highly educated people outside major urban areas are the result of investments in education by local governments in these areas, but they are lost through a brain drain to Tokyo, while Tokyo is able to obtain these human resources "free of charge."

On the other hand, migration of non-educated young people to Tokyo is at far lower levels than during the rapid economic growth period. As a result, for the service industry, the question is how firms should respond to rising wages and where they can acquire the low-wage labor force, but there are several possible ways of dealing with this. The first is the transfer of processes to peripheral regions. Just as factories carrying out some processes moved to peripheral regions in the 1970s, office workflows have been subdivided into tasks. Since the 2000s, the number of firms who set up call centers in local cities where wages are low by separating only office telephone services has increased. Location of call centers in provincial cities such as Sapporo and Okinawa, where there are insufficient jobs for young people and wages are relatively low, certainly has the effect of creating employment, but the limitations of relocating only simple, relatively unskilled processes are clear, as it was with factories. Only a small percentage of office jobs are being relocated in the first place, and they do not make up a large slice of the employment pie, so benefits to local economies comparable to those of factory relocation cannot be expected. Producer services are greatly influenced by agglomeration economies, and only a limited range of functions are capable of being transferred from Tokyo.

Other countermeasures are conversion of jobs to part-time employment and introduction of non-Japanese workers. In the 2000s non-regular employment became increasingly prevalent in Japan, and many young people became part-time workers due to difficulty securing jobs. This increase in part-time workers has held back wage increases and helped reduce labor costs for firms, but income instability has hindered the formation of workers' families and is one of the factors behind the current declining birthrate (Nakazawa 2019b). And since the latter half of the 2010s, with baby boomers retiring and the younger workforce shrinking due to even lower birthrates, the supply of low-wage labor has decreased and labor shortages have become a problem. In response to this, the introduction of non-Japanese labor is increasing rapidly, and dependence on non-Japanese workers is gradually growing.

As described above, firms have enjoyed the benefits of agglomeration economies by locating in Tokyo, and have responded to the associated diseconomies using various means. However, it is valid to say that firms are shifting the burdens, or risks, to society at large.

III. Factors related to cities' attributes

1. Reasons for overconcentration in Tokyo

According to the British economic geographer Martin (2015), who analyzed the relationship between urban growth and city size in the United Kingdom, it is not necessarily always larger cities that are growing. For example, if we divide Britain into northern and southern halves, the cities in the south are growing while the cities in the north are stagnant or declining. A similar situation is found in other Western countries, indicating

that agglomeration economies of scale alone cannot explain disparities in urban growth.

The description of the current situation not as "concentration in major cities" but as "overconcentration in Tokyo" is due in large part to the decline in the economic status of the Osaka region. Abe (2017), who studies urban systems in terms of the locations of firms' headquarters and branch offices, notes that overconcentration in Tokyo is due in large part to the decline in command and control functions of firms in Osaka. Specifically, the number of firms relocating head offices from Osaka to Tokyo has grown, and along with this, the population migration from Osaka and the surrounding Keihanshin (Kyoto-Osaka-Kobe) conurbation to Tokyo has increased accordingly. The problem of overconcentration in Tokyo could be rephrased as the "Osaka problem."

Several factors contributing to the decline in Osaka's economic status have been noted. The first relates to development of transportation networks, the second is the fact that Tokyo has become a world city or a global city, and the third is a difference in industrial composition. Each of these is described below.

2. The "straw effect" resulting from development of transportation networks

Fujita, Hamaguchi and Kameyama (2018) ascribe the decline in Osaka's status to development of transportation networks. With the advancement of modes of transportation, larger cities absorb demand from smaller ones, and various functions are transferred to and absorbed by large cities. This is known in Japan as the "straw effect." Before the Shinkansen high-speed rail line began operating in 1964, Japan was structured so that Tokyo had de facto control of eastern Japan and Osaka of western Japan, and many firms had their headquarters in western Japan's hub of Osaka. However, the Shinkansen made it possible to take day trips from Tokyo to western Japan. As a result, firms began to concentrate their management functions in Tokyo, leading to a decline in the status of Osaka. This explanation is simple and straightforward in terms of reduced travel costs (with time included in the cost) and city size of the city, but as they point out, the question arises of why the "straw effect" impacts Osaka more strongly than Nagoya, which is closer to Tokyo. The "straw effect" alone is evidently not sufficient to explain the decline in Osaka's status.

3. Growth disparities between world cities (global cities) and other cities

John Friedmann (1986) noted that as firms become multinational and cross-border business activities increase, control centers for those activities are needed, and described the locations chosen as control centers "world cities." Meanwhile, Sassen (1991), while basically building on Friedmann's world city argument, focused on the financial services industry, such as banking, securities and insurance, and advanced producer services, such as law, accounting and consulting, proposing that a "global city" was a site where such services are produced. As for specific cities, New York, London, and Tokyo are named as the top cities in both Friedmann's world city framework and Sassen's framework of the global city.

However, it should be noted that Friedmann's paper was written in 1986 and Sassen's in 1991 (second edition 2001), and that during the period from the 1980s through the early 1990s when these papers were written, Japan's manufacturing exports and overseas investment by the country's financial institutions was at its peak.[3] According to Taylor and Derudder (2016), who quantitatively and empirically analyzed rankings of global cities based on data, Tokyo had dropped in rank since the 2000s and was ranked lower than Hong Kong and Singapore in an analysis of the global service industry. In Sassen's argument, Tokyo is framed as a supply center for money earned by exporting firms, and Kamo (2005) also describes Tokyo as a "money supplier-type" world city, in other words a "Japanese-style world city" that differs from New York or London. It is true that among Japanese cities, global service firms are based in Tokyo, but Tokyo's position relative to other cities of the world and financial services' share of the overall Tokyo economy are not necessarily large. Tokyo is the place where the head offices of Japanese firms, which are active globally, are concentrated. To say that Tokyo has become a global city means that it has become a base for Japanese multinationals, especially for their finance-related divisions, not that it has become a base for global service firms. Tokyo's becoming a world city

had the effect of accelerating concentration of financial transactions in Tokyo and the relocation of the finance-related services sector from Osaka to Tokyo (Narita 1990). Since the 1970s, relocations of head offices to Tokyo, particularly financial institutions and trading companies, have accelerated, and these head office relocations are accompanied by relocation of financial transactions, which has led to further concentration in Tokyo.

However, the rise of world cities does not necessarily signify concentration of population and industry in these world cities at the domestic level. In the United States, concentration in New York was rather low in the 1980s when world cities were emerging (Narita 1990). Sassen (1991) points out that while the number of firms headquartered in London, New York, and Chicago continues to shrink, the number of firms headquartered in Tokyo continues to grow. She argues that the reason is that it is important to have headquarters in Tokyo, where government offices are located, because of robust government regulation in Japan. In that sense, we cannot overlook the fact that concentration of Japanese head offices in Tokyo is not only because it has become a world city, but also due to the relationship between business and Japan's centralized administrative system.[4] According to a study by Fujimoto (2017) of the chemical and construction industries, face-to-face contact with representatives of government agencies holding licensing authority is important in Japan, which has fed the relocation of head offices to Tokyo from other regions. It is better to think of concentration of head offices in Tokyo as the result not only of rational market action but also the influence of other factors, i.e. the characteristics of the Japanese administrative system. This can be seen as one reason Kamo makes a point of calling Tokyo a "Japanese-style world city."

4. Growth disparities based on differences in industrial composition and specialized industries

Differences in industrial composition or in specialized industries can be described as the orthodox explanation for differences between Tokyo and Osaka. For example, the information technology sector, currently a growth industry, is remarkably concentrated in the Tokyo region, especially in central Tokyo (Matsubara 2014; Kato 2019). Tokyo has such growth industries generating increased employment that more than compensates for the shrinking manufacturing sector, while Osaka has a preponderance of stagnant manufacturing industries such as textiles, steel and metals, while increases in producer services such as finance and information are limited. In the Nagoya region, the population of which is growing compared to that of Osaka, the main industry is manufacturing, but the difference from Osaka is that it specializes in the relatively stable automobile industry.

Storper et al. (2015), who emphasize differences in the industries in which cities specialize, compared and analyzed Los Angeles and San Francisco in terms of per capita income. Until the 1980s, per capita income was about the same in both metropolitan areas, but since the 1980s, per capita income has risen in the greater San Francisco area, while it has stagnated in the greater Los Angeles area. The reason is that the San Francisco area is specifically geared toward high-growth industries such as software and infotech, while Los Angeles is weighted toward the aerospace industry, which has stagnated due to reduced military spending since the end of the Cold War. Also, wages are low in the transportation and logistics industries, of which Los Angeles is a major center, and while wages are high in the famous Hollywood film industry, its scale is small and does not have a significant impact on the entire city. They argue that these differences in specialized industries are a factor driving disparity in per capita income.

Based on an analysis of data on American metropolitan areas, the urban economist Moretti (2014) asserts that the concentration of innovation industries[5] has a positive impact on employees of other industries, raising the per capita income in the region. He points out that innovation industries are characterized by concentration in a small number of specific regions, and states that whether or not a region becomes an innovation hub is path dependent. This is an important point. Evolutionary economic geography studies have shown that new industries branch off from existing related industries (Mizuno 2018, 2019). For example, much of the infotech industry in Tokyo has branched off from the computer industry, while the computer industry branched from the

industrial electrical machinery industry including communications equipment. Furthermore, the industrial machinery industry has been developing under the leadership of the government since the Meiji Era (1868-1912), and the fact that military industry and national research institutes were located in the capital was an important factor in centering these industries in the Tokyo region (Akahane 1977). These historical paths are important for the development of new industries. Of course, cities with historically diverse industries do not always create the next new industry, and it is a mistake to regard path dependence as a deterministic inevitability, but it is true that new industries rarely emerge in places where there is no existing industrial base. Florida (2002) argues that urban economies develop when policies that attract skilled and creative people are adopted, while Storper (2013) conversely argues that the location of industry is path dependent, and that a city of creative people does not always become a hub for the tech sector.

IV. Evaluation of overconcentration in Tokyo and resulting policies

Thus far, this article has described how concentration of firms in Tokyo has been caused by two factors: agglomeration economies and the city's attributes. It has also pointed out the advantages and disadvantages of agglomeration, between which there are very real conflicts. Judging the extent to which they are occurring and the balance between them can determine how concentration is evaluated. If it is clear that the benefits of agglomeration in Tokyo or other large cities are distributed throughout Japan, that is, they have the effect of stimulating economic activity in small and medium-sized cities and rural areas outside Tokyo, concentration may not necessarily be considered a problem. However, overconcentration in Tokyo is currently regarded as a problem, and the probable reason is the fact that those outside the region are not experiencing such a trickle-down effect.[6] There is great diversity of opinion on how concentration and agglomeration should be evaluated, and what sorts of policies are desirable.

The American urban economist Glaeser (2012) is a leading proponent of the argument that dense cities increase productivity through the spillover of knowledge. Among his policy prescriptions is deregulation of housing construction so that buildings can be made even higher. However, this must be seen in the context of the United States. Public transit options such as trains are scarce in many American cities, and people's own cars are the primary means of transportation. To alleviate traffic congestion, cities have become more suburbanized, in the form of horizontal sprawl, and urban areas are becoming less dense. Glaeser's proposal should be viewed as a response to this situation, and applying it without any modifications to already dense Tokyo is problematic.

Some economists in Japan do not consider overconcentration in Tokyo and the associated regional disparities to be a problem (e.g. Hatta 2015; Hatta and Ueda 2006). They hold that concentration in Tokyo is due to market mechanism, which should not be hindered, and that policies aimed at balanced development have a negative impact on national growth. Regarding agglomeration diseconomies such as rising housing costs, they argue that government regulation is the root cause, and deregulation to boost housing supply and migration to larger cities is the solution. These arguments continue to have a significant influence on policymaking.

However, these assertions appear to be based on the premise that Tokyo is growing only through market mechanisms, while regions other than Tokyo depend only on fiscal reallocation. As economists including Hayashi et al. (2018) have pointed out, it is mistaken to think that Tokyo has grown solely due to market mechanisms.[7] As we have already seen, it is undeniable that discretionary administration such as approvals and licensing by government agencies, and a centralized administrative system, have contributed to concentration in Tokyo. Also, the locations of industries are path dependent, and the concentration of the high-growth tech sector in Tokyo is influenced by the legacy of the pre-World War II military-industrial complex and the establishment of national research institutes in Tokyo, the nation's capital.

Furthermore, the argument in favor of overconcentration is based on the premise that policies aimed at

reducing geographical imbalances result in inefficiencies and negatively affect the economic growth of the country as a whole. This might certainly be a valid proposition when operating with specific assumptions under a simplified economic model, and there will certainly be significant harmful effects if extreme policies such as completely uniform allocation of economic activity are carried out. However, as Martin (2015) notes, the nature of the tradeoff between correction of geographical imbalances and national economic growth has not been clearly shown in empirical studies. Also, analyses of productivity do not reflect congestion of commuting routes and the costs of housing purchases and rentals, and cities' "livability" is difficult to thoroughly quantify and to incorporate into economic analysis. Furthermore, the difficulty of raising children in excessively concentrated regions due to long commutes, long working hours and lack of childcare facilities[8] leads to a declining birthrate and hinders the reproducibility of society (Nakazawa 2019a). In light of the current situation, we cannot ignore the fact that dense cities also exacerbate the risk of infectious diseases. Overall, it should be recognized that while current policy discussions emphasize agglomeration economies, agglomeration diseconomies tend to be underestimated. In examinations of policy it is necessary to legitimately evaluate the benefits of agglomeration described in this article, and policies that ignore these altogether are likely to fail. However, there is danger in viewing these benefits as an absolute good and viewing anything that stands in their way as an evil.

It is also important to consider the attributes of cities such as the industries they are geared toward, and recognize that it is not only degree of agglomeration that determines a city's development. These attributes have been formed through history and geography. Prescriptions for making cities denser or larger are influential because they are simple and easy for policymakers to understand, but agglomeration is not a universal panacea (Martin 2015). Examining the development of a city requires analysis based on historical paths and geographical context, and policies based on these analyses are necessary. This is the fundamental concept of economic geography.

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Notes

1. In economics, the term "increasing returns to scale" is used to describe such scale-related phenomena.
2. A similar phenomenon was seen in the United Kingdom during the same period, when only specific processes were relocated to northern industrial cities for the purpose of curbing wages, while R&D functions were retained in greater London in the southeast (Massey, 1984).
3. For example, compared to those years, in Tokyo today the percentage of workers in the financial industry is declining due to mergers of financial institutions and consolidation of branch offices.
4. Of course, besides regulations, the size of the land is another factor that differentiates Japan from the US.
5. In addition to high-tech manufacturing such as IT and life sciences, software, and Internet-related industries, this also includes some areas of entertainment and finance.
6. Myrdal argued that between advanced regions and underdeveloped regions, there are both a positive spread effect and a negative backwash effect on the underdeveloped regions. Also, Myrdal states that when entrusted to the market, the backwash effect tends to work strongly, while when welfare state policies are implemented, the spread effect works strongly and disparities are narrowed (Myrdal 1957).
7. This is not limited to Japan, where administrative guidance by the government has played a major role. Martin (2015) states that London is a centralized government location and enjoys state support as a beneficiary of public spending, and it is incorrect to attribute London's concentration solely to market mechanisms.
8. While it is theoretically possible to increase the supply of daycare centers while lowering the quality of childcare, the medium- to long-term negative impact will be significant, in that the importance of early childhood education has been noted, and low-quality childcare reduces the quality of human capital in economic terms (Yamaguchi 2019).

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MIZUNO Masahiko
Professor, Osaka Prefecture University.

Trends in Task Distribution in Japan, 1990–2015: Evidence from the Occupational Information Network of Japan and the Population Census Data

KOMATSU Kyoko
MUGIYAMA Ryota

This article analyzes task trends in Japan from 1990 to 2015, using the Population Census and the Occupational Information Network of Japan (hereinafter, Japanese O-NET) developed in 2020. First, following Acemoglu and Autor (2011), we classified tasks into the five categories: (1) non-routine analytical; (2) non-routine interactive; (3) routine cognitive; (4) routine manual; (5) non-routine manual tasks. Then, we analyzed the changes of each task distribution from 1990 to 2015. The results show a "task polarization" trend. Both high-skilled non-routine analytical and interactive tasks and low-skilled non-routine manual tasks increased but middle-skilled routine manual tasks have decreased. We also show that the trends vary by workers' characteristics such as gender, age, and employment status. For example, women experienced a larger increase in non-routine tasks than men; Polarization trend is apparent especially among female regular workers since 2005.

I. Introduction

Recently, many studies argue that computers have replaced routine tasks carried out by humans, which resulted in labor market polarization in Europe and the United States (e.g., Autor et al. 2003, Spitz-Oener 2006, Goos and Manning 2007, Goos et al. 2009, Ikenaga 2009, Acemoglu and Autor 2011, Autor and Dorn 2013, Ikenaga and Kambayashi 2016). A task is defined as "a unit of work activity that produces output" (Acemoglu and Autor 2011: 1045). In their landmark study, Autor et al. (2003) classified tasks of workers according to whether the task is routine or non-routine and whether intellectual or physical. There are five task categories: (1) non-routine analytical tasks that require problem solving using abstract thinking; (2) non-routine interactive tasks that create value through advanced interpersonal communication; (3) routine cognitive tasks which are clerical tasks that follow explicit rules; (4) routine manual tasks which are physical tasks that follow explicit rules; (5) non-routine manual tasks which are physical tasks that require a flexible response to particular situation without advanced expertise (Ikenaga and Kambayashi 2016).

These studies argue that demand for routine tasks will decrease because they can be replaced by automation, while demand for non-routine tasks will increase because they are complementary to automation.[1] They also show that routine tasks decreased and non-routine tasks increased in line with computerization.

Because jobs with routine tasks provide moderate wages while jobs with non-routine tasks offer higher wages for analytical and interactive tasks and lower wages for manual tasks, the shift from routine to non-routine tasks results in labor market polarization. In these studies, occupational information databases in the United States, such as the DOT (Dictionary of Occupational Titles)[2] and O*NET (Occupational Information Network)[3] are used. These databases measure tasks and skills by 3-digit (or 4-digit) occupations.

In Japan, Ikenaga (2009) and Ikenaga and Kambayashi (2016) used the occupational information website, *Career Matrix*,[4] to analyze the task trends in Japan. They showed that routine tasks decreased while non-routine tasks increased from 1960 to 2005, as in the Western countries. They also pointed out three differences between the United States and Japan. First, while routine cognitive tasks have decreased in the United States since the 1980s, it has increased in Japan (Ikanaga 2009). Second, non-routine manual tasks have risen in Japan, which is contrary to the United States (Ikenaga 2009, Ikenaga and Kambayashi 2016).[5] Finally, progress of task polarization is slower and smaller in Japan than in other countries (Ikenaga and Kambayashi 2016).

This article reveals the trends in task distribution in Japan from 1990 to 2015, using the Japanese O-NET released in 2020 by the Ministry of Health, Labour and Welfare[6] and the Population Census. We explore the following two issues. First, we examine the latest task trends from 1990 to 2015. Second, we disaggregate the overall trends by workers' characteristics, including gender, age, and employment status. Another contribution is to improve the Ikenaga and Kambayashi (2016)'s measurement of tasks by using multiple indicators from Japanese O-NET. We discuss this in detail in the following section.

II. Method

We used two datasets: the Population Census of Japan from 1990 to 2015 and the Japanese O-NET. The formar is conducted every five years. We obtained the aggregated data by 3-digit occupation, gender, 10-year age groups and employment status from e-Stat (https://www.e-stat.go.jp/). The latter is from the Occupational Information Database Quantitative Downloadable Data version 2.01 (https://shigoto.mhlw.go.jp/User/download) with the latest information collected in January and February 2021.[7]

Task scores for each occupation were calculated by matching the occupations of the Population Census with occupations listed in the Japanese O-NET.[8] A very small number of occupations such as unclassifiable occupations and occupations for which there were no similar occupations in the Japanese O-NET were excluded from the analysis.

It should be noted that we assume that the task information obtained from the Japanese O-NET remains constant between the observation periods, from 1990 to 2015. In other words, we do not capture the within-occupational task increase (or decrease). Thus, the scores of task indices change only when the occupational composition changes.[9]

Quantitative information from the Japanese O-NET was used to calculate the five types of tasks for each occupation covered in this study. Table 1 shows the definitions of each category and the indicators used in previous studies and this study for the respective category. Basically, following Acemoglu and Autor (2011), we constructed five task categories. However, we revised Acemoglu and Autor (2011)'s construction of non-routine manual tasks that include "Operating Vehicles, Mechanized Devices, or Equipment" and "manual tasks involving handling objects, tools, and controls," which is related to physical labor dealing with machines and tools. Their operationalization does not include service-related tasks even though the original definition of non-routine manual tasks comprises physical tasks that require flexible response depending on the situation.[10] To reflect the original definition of non-routine manual tasks, instead, we used the following four items: "performing general physical activities," "handling and moving objects," "assisting and caring for others," and "working directly with or for the public."

Our indices also differ from Ikenaga and Kambayashi (2016), which studied the labor market polarization trends in Japan. First, the data sources on tasks are different. We used the Japanese O-NET, while Ikenaga and

Table 1. Definitions and measurements of the five tasks

Five task categories	Definitions	Autor et al. (2003) **DOT**	Ikenaga and Kambayashi (2016) **Career Matrix**	Acemoglu and Autor (2011) **O*NET**	This study **Japanese O-NET**
Non-routine Analytical	Tasks requiring advanced expertise and the ability to solve problems using abstract thinking Examples: Research, surveys, design	General Education Development Index · GED Math	Skills Index · Mathematics	Generalized Work Activities Index · Analyzing data/information · Thinking creatively · Interpreting information for others	Generalized Work Activities Index · Analyzing data/information · Thinking creatively · Interpreting information for others
Non-routine Interactive	Tasks that create and deliver value through advanced interpersonal communication such as negotiation, management and consulting activities Examples: Law, management and administration, consulting, education, arts, performing arts, sales	Temperament Index · Direction, Control, Planning	Skills Index · Negotiation	Generalized Work Activities Index · Establishing and maintaining personal relationships · Guiding, directing and motivating subordinates · Coaching/developing others	Generalized Work Activities Index · Establishing and maintaining personal relationships · Guiding, directing and motivating subordinates · Coaching/developing others
Routine Cognitive	Clerical and information-processing tasks that follow explicit rules Examples: General clerical workers, accountancy clerks, testing and observation	Temperament Index · Set limits, Tolerances, or Standards	Skills Index · Operation and control	Work Context Index · Importance of repeating the same tasks · Importance of being exact or accurate · Structured v. Unstructured work (reverse)	Work Context Index · Importance of repeating the same tasks · Importance of being exact or accurate · Structured v. Unstructured work (reverse)
Routine Manual	Physical tasks that follow explicit rules Examples: Agriculture, manufacturing	Aptitude Index · Finger Dexterity	Skills Index · Repairing	Work Context Index · Pace determined by speed of equipment · Spend time making repetitive motions Generalized Work Activities Index · Controlling machines and processes	Work Context Index · Pace determined by speed of equipment · Spend time making repetitive motions Generalized Work Activities Index · Controlling machines and processes
Non-routine Manual	Physical tasks not requiring a high level of specialized knowledge, but requiring a flexible response to particular situation Examples: Service, hospitality, beauty, security, operation of transport equipment, maintenance and repair	Aptitude Index · Eye-Hand-Foot Coordination	Skills Index · Service orientation	Generalized Work Activities Index · Operating vehicles, mechanized devices, or equipment Work Context Index · Spend time using hands to handle, control or feel objects, tools or controls Abilities Index · Manual dexterity · Spatial orientation	Generalized Work Activities Index · Performing general physical activities · Handling and moving objects by using hands and arms · Assisting and caring for others · Performing for or working directly with the public

Sources: Autor et al. (2003), Ikenaga (2009), Acemoglu and Autor (2011), Ikenaga and Kambayashi (2016).

Kambayashi (2016) used the Career Matrix. Second, we utilized multiple indicators to construct each task index, while they utilized only one indicator. Third, the content of items to construct routine cognitive tasks are quite different. While Ikenaga and Kambayashi (2016) measured routine cognitive tasks by the indicator "skill with equipment and controls (controlling the motion and operation of devices, equipment, or systems)", we measured tasks by the indicators "repetition of the same task (continuous and repetitive mental and physical activity)," "rigor and accuracy (precision and accuracy in performing work)," and "structuring of work (extent to which work priorities and goals are determined with little scope for judgment)." Ikenaga and Kambayashi's (2016) definition of routine cognitive tasks refers to physical labor using machines, while ours refers to not only physical work but also clerical work. Fourth and finally, the contents of indicators to construct non-routine manual tasks are also different. Although Ikenaga and Kambayashi (2016) used the index "skill with interpersonal support services (proactively seeking effective solutions to assist others, such as customers and people in need)," we consider this skill requires relatively a high degree of expertise and therefore deviates from the original definition of non-routine manual tasks.[11]

Following Acemoglu and Autor (2011: 1164), we calculated the five task scores as follows. First, each scale is standardized to have a mean zero and a standard deviation one, using the weight of the number of workers from the Population Census 2005. Second, we added respective constituent scales to create a composite task index. Third, the composite task index is re-standardized to have a mean zero and a standard deviation one, using the weight of the number of workers from the Population Census 2005.

III. Results

1. Characteristics of the Five Tasks

Before moving on to the discussion of task trends, let us examine the types of occupations that had high scores for each task, and correlations among tasks. Table 2 shows the occupations with the top ten highest scores for the five task categories. The occupations with the highest scores of non-routine analytical tasks are researchers and university professors. The occupations with the highest score of non-routine interactive task score is administrative and managerial workers. The occupations with the highest score of routine cognitive task and routine manual tasks is railway drivers. Meanwhile, the occupation with the highest score of the non-routine manual task score is midwives.

Table 3 shows the correlation coefficients among the five task categories. The correlation between non-routine analytical tasks and non-routine interactive tasks is high at 0.87, as these tasks have similar characteristics. The correlation between non-routine interactive tasks and non-routine manual tasks is also relatively high at 0.53. On the other hand, there is a slight negative correlation between non-routine analytical/non-routine interactive tasks and routine manual tasks.

2. Trends in Task Distribution

Figure 1 shows how the scores for each task changed from 1990 to 2015, with 2005 as zero. As described above, changes in task scores correspond to changes in the occupation distribution. For example, an upward trend in scores for non-routine analytical tasks indicates either an increase in the share of occupations that perform more non-routine analytical tasks or a decrease in the share of occupations that perform fewer non-routine analytical tasks.

Non-routine analytical tasks, non-routine interactive tasks, and non-routine manual tasks, which are considered difficult to replace through automation, increased, while routine manual tasks decreased. Furthermore, routine cognitive tasks were on the increase from 1990 to 2005, but have been flat since 2005. In terms of differences from previous studies, non-routine manual tasks trended downward in the United States (Autor et al. 2003), but trended upward in Japan. Meanwhile, routine cognitive tasks have increased from 1990 to 2000, in contrast to Ikenaga and Kambayashi (2016).

Table 2. Top ten occupations with the highest scores for each task

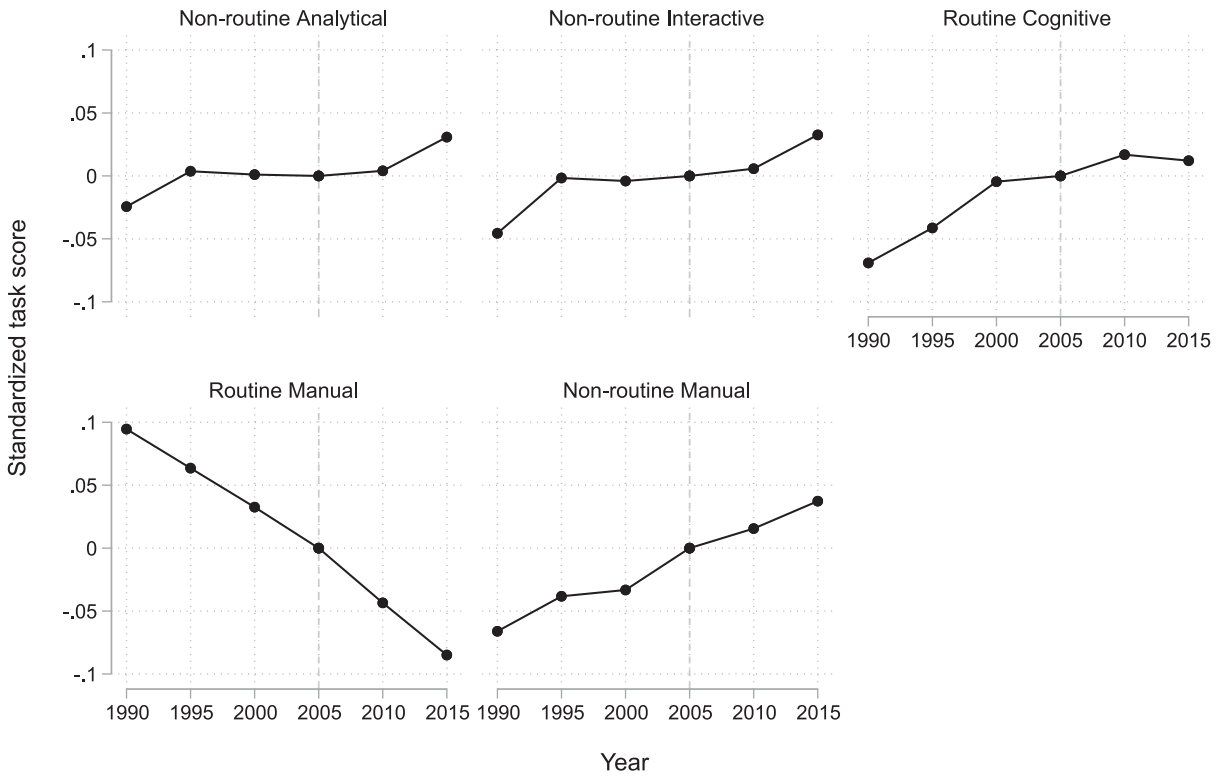
	Non-routine Analytical		Non-routine Interactive		Routine Cognitive	
1	Natural science researchers	3.04	Administrative and managerial workers not classified elsewhere	3.12	Railway drivers	4.21
2	University professors	3.04	Administrative civil servants	3.12	Train conductors	3.01
3	Humanities, social science and other researchers	3.04	Corporate and organizational management professionals	3.12	Prison guards, other public security officers	2.91
4	Dancers, actors, directors, performers	2.34	Firefighters	2.87	Clinical laboratory technicians	2.89
5	Certified Public Accountants	2.32	Midwives	2.71	Transportation machinery maintenance and repair workers (excluding automobiles)	2.79
6	Journalists, editors	2.31	Transportation machinery maintenance and repair workers (excluding automobiles)	2.65	Aircraft pilots	2.42
7	System consultants, System designers	2.26	Prison guards, other public security officers	2.51	Railway line construction workers	2.30
8	Physio therapists, occupational therapists	2.25	Restaurateurs, restaurant managers	2.44	Other outdoor service workers	2.16
9	Chemical engineers	2.15	Railway line construction workers	2.29	Money collectors	2.16
10	Pharmaceutical sales professionals	2.13	Police officers, maritime safety officials	2.29	Investigators	2.16
	Routine Manual		**Non-routine Manual**			
1	Railway drivers	3.93	Midwives	3.57		
2	Aircraft pilots	3.42	Firefighters	3.53		
3	Ship's chief engineers, engineers (except fishing boats)	3.22	Physio therapists, occupational therapists	3.25		
4	Cleaning workers	3.12	Childcare workers	2.78		
5	Clinical laboratory technicians	2.99	Personal trainers (sports)	2.70		
6	Pig-iron forging, steelmaking, non-ferrous metal smelting workers	2.39	Nurses (including assistant nurses)	2.64		
7	Metal cutting and machining workers	2.39	Special-needs school education teachers	2.56		
8	Construction, well-drilling machinery operators	2.28	Home visiting care workers	2.33		
9	Crane/winch operators	2.28	Other healthcare service professionals	2.31		
10	Transportation machinery maintenance and repair workers (excluding automobiles)	2.23	Travel and tourist guides	2.30		

Note: Authors' calculations using data from the Population Census and the Japanese O-NET. It shows standardized task scores weighted by number of workers in 2005.

Table 3. Correlation coefficients among the five tasks

	Non-routine Analytic	Non-routine Interactive	Routine Cognitive	Routine Manual	Non-routine Manual
Non-routine Analytic	1.00				
Non-routine Interactive	0.87	1.00			
Routine Cognitive	0.12	0.26	1.00		
Routine Manual	-0.17	-0.09	0.31	1.00	
Non-routine Manual	0.28	0.53	0.09	0.35	1.00

Note: Authors' calculations using data from the Population Census and Japanese O-NET. It shows correlation coefficients weighted by the number of workers in 2005.

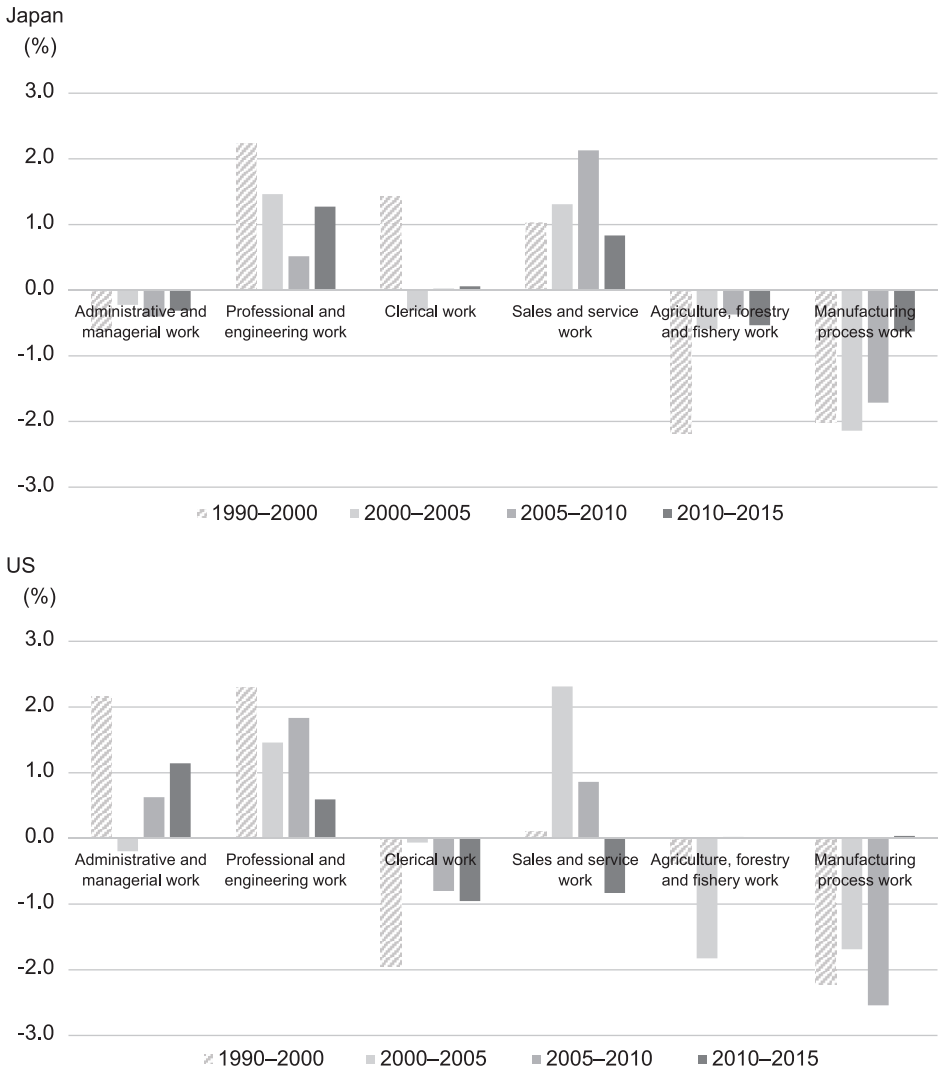


Note: Authors' calculations using data from the Population Census and Japanese O-NET. Old codes are used until 2005 and new codes from 2010 onward. The Standardized task score for each year is calculated with 2005 as zero.

Figure 1. Trends in task scores (1990–2015)

In Acemoglu and Autor (2011), each task corresponds to major occupational categories: non-routine analytical and interactive tasks are strongly correlated with, for example, managers and professional engineers, routine cognitive tasks with clerical and sales clerks, routine cognitive and routine manual tasks with manufacturing process workers, and non-routine manual tasks with service staff. In this context, here we will examine the changes in the share of workers by major occupational categories, comparing Japan with the United States between 1990 and 2015 (Figure 2). The common trend is that the shares of professional and engineering workers and sales and service workers are increasing, while the share of agriculture, forestry, and fishery workers and manufacturing process workers is decreasing. On the other hand, there are some differences. From 1990 to 2015, the share of administrative and managerial workers increased in the US, while it decreased in Japan. Furthermore, in the US, the share of clerical workers declined consistently, while in Japan, the share of clerical workers increased significantly until 2000 with no significant downward trend as in the US.

In addition, Table 4 shows the specific top ten occupations whose share of workers increased or decreased



Source: ILOSTAT Database.

Figure 2. Changes in the share of workers by major occupational category (1990–2015) in Japan and US

between 1990 and 2015. Changes from 1990 to 2005 are shown using the old code, and those from 2005 to 2015 are shown using the new code.

First, let us examine the top ten occupations in terms of the rate of increase/decrease in the share of workers from 1990 to 2005. The share of agricultural workers and manufacturing process workers with high routine manual task scores decreased, while the share of general clerical workers with high routine cognitive task scores increased significantly, and the share of service workers with high non-routine manual task scores increased. Meanwhile, the share of non-routine analytical and interactive task scores rose, despite the decrease in the share of managers with high non-routine analytical and interactive task scores. This is partly because the increase in the share of clerical workers and professional engineers with high non-routine analytical and interactive task scores was greater than the rate of decrease in the share of managers.

Next, focusing on changes between 2005 and 2015, the share of agricultural workers and manufacturing process workers with high routine manual task scores continued to decrease. On the other hand, the share of clerical workers and professional engineers with high non-routine analytical and interactive task scores, and the share of care workers with high non-routine manual task scores increased. It is notable that from 2005 to

Table 4. Task scores for top ten occupations in which share of workers increased or decreased

[1990–2005]

Top 10 occupations of increase rate in share of workers engaged	Share in 1990	Increase rate in share of workers engaged (%point)	Non-routine Analytical	Non-routine Interactive	Routine Cognitive	Routine Manual	Non-routine Manual
1 General clerical workers	13.6%	1.6%	0.47	0.18	0.17	-0.99	-0.95
2 Service industry workers not otherwise classified	0.2%	1.4%	-0.05	0.22	-0.04	-0.71	1.12
3 Cleaning workers	0.9%	0.7%	-1.40	-0.39	-0.78	0.33	0.58
4 Sales clerks	5.0%	0.6%	-0.65	-0.40	-0.12	-0.24	0.11
5 Sales people (excluding products, insurance, and real estate)	1.4%	0.6%	1.13	1.01	-0.25	-1.22	-0.50
6 Nurses	1.2%	0.5%	1.25	1.72	1.50	1.11	2.80
7 Other food manufacturing workers	0.6%	0.5%	-0.70	-0.64	0.67	1.98	-0.27
8 Housework service providers	0.2%	0.4%	-0.75	-0.72	-0.98	-1.64	1.22
9 Data processing technicians	0.9%	0.4%	1.74	0.79	-0.69	-1.26	-1.22
10 Cooks	2.7%	0.4%	-1.11	-0.36	-0.17	0.62	0.25

Top 10 occupations of decrease rate in share of workers engaged	Share in 1990	Decrease rate in share of workers engaged (%point)	Non-routine Analytical	Non-routine Interactive	Routine Cognitive	Routine Manual	Non-routine Manual
1 Agricultural and sericulture workers	5.7%	-1.9%	-1.15	-1.93	-2.53	0.44	-0.29
2 Company executives	2.5%	-0.8%	0.65	0.38	-2.18	-0.97	-0.05
3 Sewing machine operators	1.1%	-0.7%	-0.95	-1.61	-1.17	1.10	-1.05
4 Accountancy clerks	4.4%	-0.7%	0.18	0.29	1.77	-0.64	-1.24
5 Corporate and organizational management professionals	1.2%	-0.7%	1.86	3.34	0.56	0.14	1.61
6 Retail managers	1.7%	-0.6%	1.39	1.69	-0.30	0.62	0.68
7 Electro-mechanical apparatus assembly workers	1.4%	-0.5%	-0.42	-0.75	0.37	0.26	-0.67
8 Other metalworkers	1.4%	-0.4%	-0.88	-0.52	1.12	1.03	-0.32
9 Carpenters	1.2%	-0.3%	-0.47	-0.82	-0.01	1.72	0.82
10 Motor vehicle drivers	3.1%	-0.3%	-1.17	-0.96	-0.26	0.25	0.15

[2005–2015]

Top 10 occupations of increase rate in share of workers engaged	Share in 2005	Increase rate in share of workers engaged (%point)	Non-routine Analytical	Non-routine Interactive	Routine Cognitive	Routine Manual	Non-routine Manual
1 Nursing staff (at medical or welfare facilities, etc.)	1.2%	0.9%	-0.09	0.16	0.26	-0.90	1.39
2 General affairs and human resources workers	1.5%	0.6%	0.68	0.46	-0.26	-1.40	-0.76
3 Building cleaning workers	0.9%	0.5%	-2.84	-2.35	-1.26	-1.06	-0.82
4 Other general clerical workers	5.3%	0.5%	0.71	0.40	0.11	-1.13	-0.73
5 Other social welfare professionals	0.4%	0.4%	1.24	1.45	-0.20	-0.60	1.72
6 Other carrying, cleaning, packaging, and related workers	1.3%	0.4%	-1.97	-1.63	0.31	0.30	-0.67
7 Nurses (including assistant nurses)	1.8%	0.4%	1.28	1.67	1.59	1.07	2.64
8 Automobile assembly workers	0.2%	0.4%	-0.08	-0.05	0.17	0.83	0.29
9 Sales clerks and sales clerical workers	0.9%	0.3%	0.62	0.59	0.44	-0.53	-0.56
10 Software creators	0.1%	0.3%	1.45	0.41	-0.75	-1.46	-1.25

Top 10 occupations of decrease rate in share of workers engaged	Share in 2005	Decrease rate in share of workers engaged (%point)	Non-routine Analytical	Non-routine Interactive	Routine Cognitive	Routine Manual	Non-routine Manual
1 Agricultural workers	3.8%	-1.0%	-0.98	-1.62	-2.56	0.42	-0.16
2 General clerical workers	5.6%	-0.9%	-1.06	-1.21	-0.08	-0.92	-1.81
3 Other sales clerical workers	3.7%	-0.8%	0.84	0.60	-0.13	-1.05	-0.66
4 Shop assistants	6.4%	-0.6%	-0.50	-0.24	-0.12	-0.25	0.19
5 Retailers, retail managers	1.1%	-0.4%	1.37	1.63	-0.24	0.59	0.71
6 Electro-mechanical apparatus assembly workers	1.2%	-0.4%	-0.14	-0.58	0.72	0.98	-0.65
7 General-purpose, manufacturing, and business-use mechanical apparatus assembly workers	0.9%	-0.4%	-0.28	-0.64	0.66	0.73	-0.32
8 Other cleaning workers	0.6%	-0.4%	-0.23	0.90	0.07	0.76	1.03
9 Accountancy clerks	2.9%	-0.3%	0.29	0.38	1.80	-0.64	-1.07
10 Spinning, weaving, apparel, and fiber product inspection workers	0.9%	-0.3%	-0.51	-1.01	-0.65	1.15	-0.63

Note: Authors' calculations using data from the Population Census and the Japanese O-NET.Gray shading is for non-routine analytical, non-routine interactive and non-routine manual tasks with a positive standardized score.

2015, the share of building cleaning workers and other carrying, cleaning, packaging, and related workers with low non-routine analytical and interactive/manual task scores increased. The growth of these occupations is thought to result from the fact that there are detailed tasks that can only be done by people who are irreplaceable by machines, and that human workers are cheaper than automation in these occupations.

Finally, let us examine the changes in the share of clerical workers with high routine cognitive task scores. After 2005 when the occupational category of "clerical workers" was subdivided, the share of general clerical workers with low non-routine analytical/interactive task scores and that of accountancy clerks with high routine cognitive task scores decreased. On the other hand, the share of general affairs and human resources workers, other general clerical workers, and sales clerks and other clerical sales workers with relatively high non-routine analytical and interactive task scores increased. As shown in Figure 2, there was no increase in the share of clerical workers as a major occupational category after 2005, but in terms of more specific occupational categories, we see that the share of the occupation increased or decreased depending on whether or not analytical and/or interactive tasks are involved.

3. Trends in task distribution by gender

Are there different task trends between men and women? Figure 3 shows trends in the five task scores by gender from 1990 to 2015. Regarding non-routine analytical and interactive tasks, the increase for women is larger than that for men, shrinking the gender gap. Routine cognitive tasks did not change significantly for men, but increased for women until 2000 and then leveled off from 2005 on. Routine manual tasks decreased for both men and women, and non-routine manual tasks did not change significantly for men, but increased significantly for women.

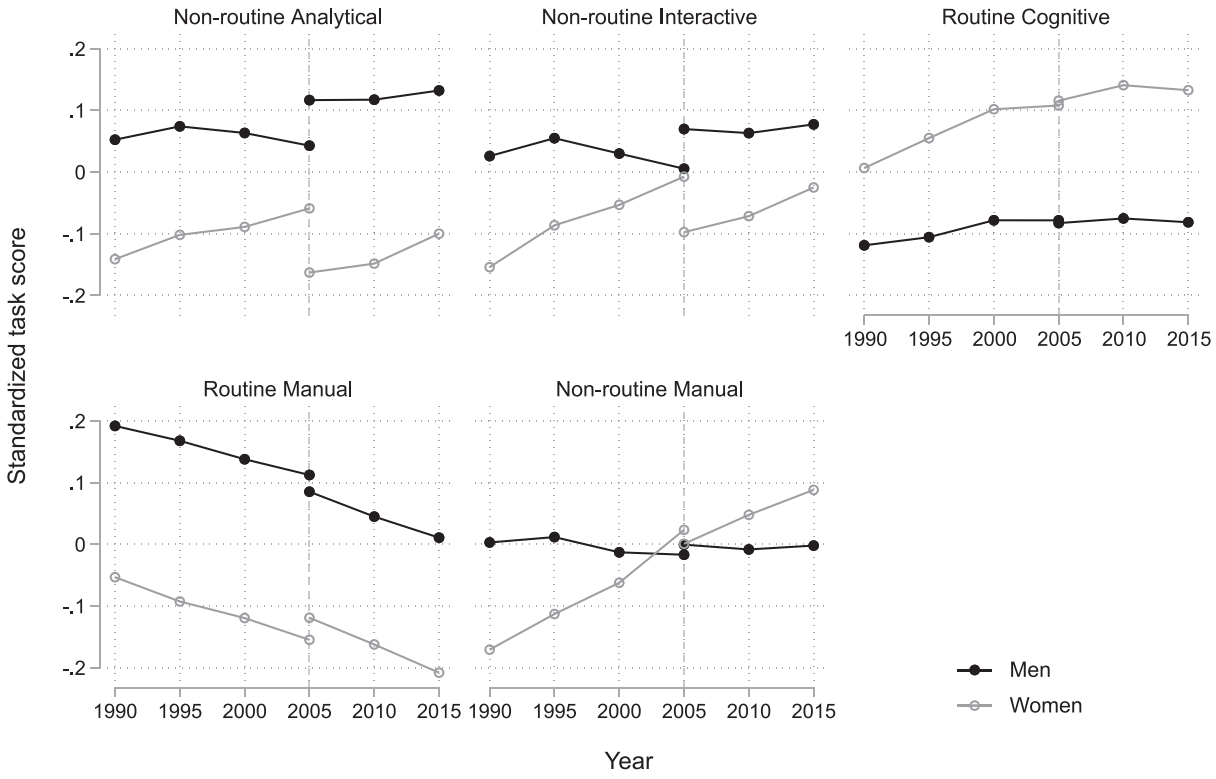
Focusing on non-routine analytical and interactive tasks, there are major differences between men and women in 2005. In particular, clerical work is the area of revision that seems to have greatly impacted the disparity in results between the new and old code. In the new code, clerical jobs that were previously grouped into a small number of categories have been divided into clerical jobs with high non-routine analytical and interactive task scores (general affairs and human resources workers, other general clerical workers, production-related clerical workers, sales clerks and sales clerical workers) and clerical jobs with low non-routine analytical and interactive task scores (general clerical workers, reception and guidance clerical workers). There are more male workers in clerical jobs with high non-routine analytical and interactive task scores, and more female workers in clerical jobs with low non-routine analytical and interactive task scores. Thus, it appears likely that the gender difference in task scores widened with the new code.

Examining the top ten occupations from 2005 to 2015, for men, professional technical positions with high non-routine task scores increased. However, it was offset by a decrease of sales positions, retailers and retail managers, administrative positions and other occupations with high non-routine task scores. Meanwhile, for women, clerical workers, sales clerks, manufacturing process workers and other occupations with low non-routine analytical and interactive task scores decreased, and clerical workers and professional technical staff with high non-routine analytical and interactive task scores increased. This explains the increase of non-routine analytical and interactive tasks for women is larger than that for men.

4. Trends in task distribution by age group

It is clear that task trends differ between men and women. Do task trends also differ depending on age, even among the same gender? Figure 4 shows trends in scores in the five task categories by both gender and age group.

For men aged 25–34, non-routine analytical and interactive tasks decreased from 1995 to 2005, while routine and non-routine manual tasks increased. In terms of specific occupations, from 1990 to 2005, the share of men aged 25 to 34 in white-collar jobs with high non-routine analytical and interactive task scores (sales people, teachers, engineers, and so forth) shrank, while the share of manufacturing process workers and service



Note: Authors' calculations using data from the Population Census and Japanese O-NET.

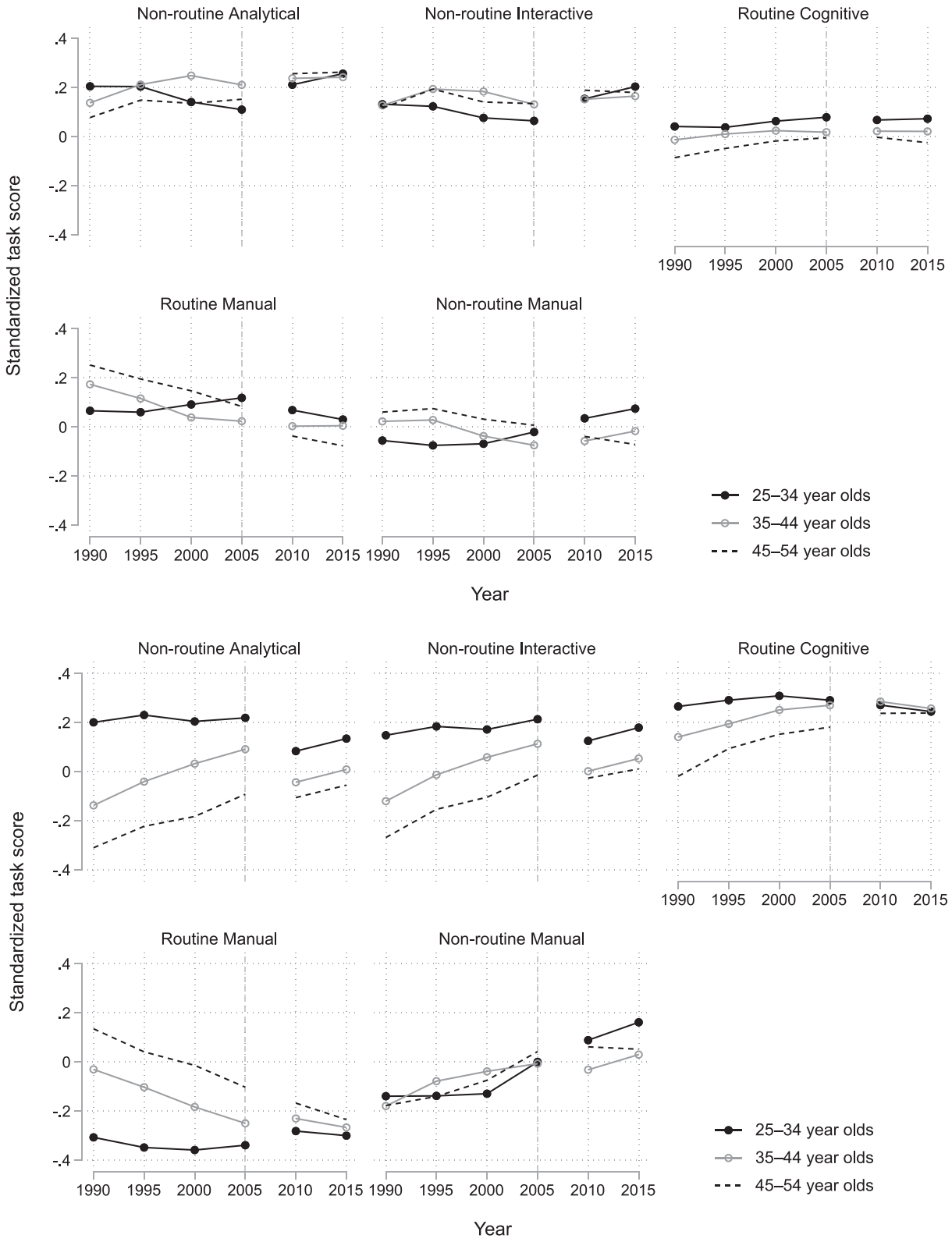
Figure 3. Trends in task scores, by gender (1990–2015)

staff with high routine manual task scores grew. In the meantime, among men aged 35 and over, non-routine analytical and interactive tasks increased while routine manual and non-routine manual task scores decreased from 1990 to 2005. It is interesting to see opposite tendencies among young and middle-aged workers, which will be examined later in the discussion.

For middle-aged and older women, non-routine analytical and interactive/manual tasks and routine cognitive tasks increased from 1990 to 2005, while routine manual tasks decreased. Specifically, the share of manufacturing process laborers and agricultural workers with high routine manual task scores fell, while the share of occupations with high non-routine analytical, interactive and manual task scores, such as general clerical workers, nurses, childcare workers, and housework service providers, rose during the same period. Turning to young women aged 25 to 34, there was no upward trend for non-routine analytical and interactive tasks from 1990 to 2005, but non-routine manual tasks trended upward from 2000 onward.

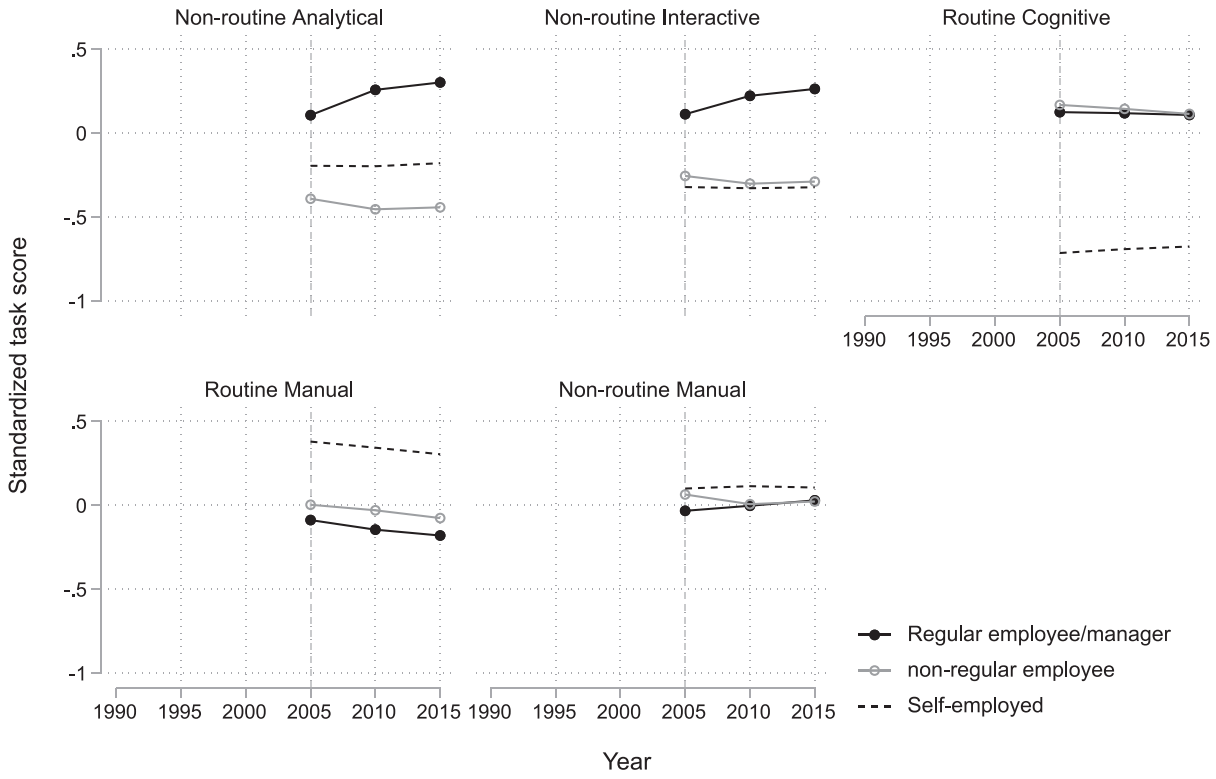
5. Trends in task distribution by employment status

In Japan, non-regular employment has been on the rise since the late 1990s. How do task score trends differ depending on the employment status? Figure 5 shows the change in scores in the five task categories by employment status between 2005 and 2015.[12] While non-routine analytical and interactive task scores rose for regular employment, task scores for non-regular employment fell slightly. As a result, the difference between non-routine analytical and interactive task scores of regular and non-regular employees is widening. Looking at specific occupations, among regular employees and managers, the share of clerical workers and specialized engineers with high non-routine analytical and interactive task scores increased, while the share of occupations with low non-routine analytical and interactive task scores, such as sales clerks and food and drink preparatory workers, declined. On the other hand, in non-regular employment, the share of occupations such as sales



Note: Authors' calculations using data from the Population Census and the Japanese O-NET.

Figure 4. Trends in task scores, by gender and age group (1990–2015)



Note: Authors' calculations using data from the Population Census and Japanese O-NET.

Figure 5. Trends in task scores, by employment status (2005–2015)

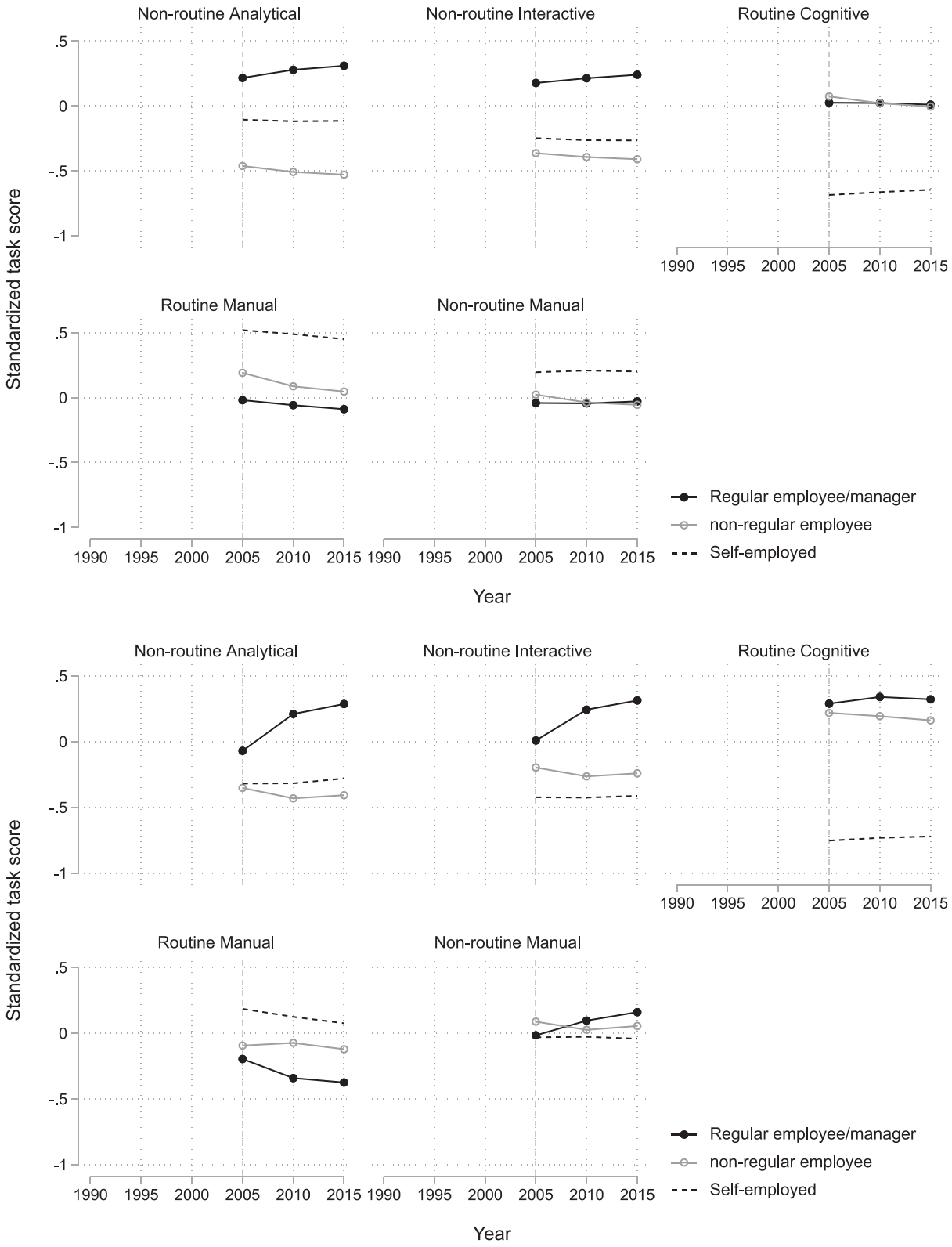
clerks, cooks and food manufacturing showed an increase, while they fell among regular employees and executives. The downward trend of non-routine analytical and interactive task scores in non-regular employment suggests that non-regular employees may have replaced regular employees in occupations that do not require these tasks.

Do task score trends by employment status differ between men and women? Figure 6 shows trends in scores for the five task categories by both gender and employment status. By gender, trends for men did not change significantly between 2005 and 2015, while for women, there was an increase in non-routine analytical, interactive and manual task scores for regular employees and managers. As a result, the difference between non-routine analytical and interactive task scores of regular and those of non-regular employees is widening.

Why is the increase in non-routine analytical, interactive and manual task scores of regular employees and managers only seen among women? Among female regular employees, the share of medical welfare professionals, clerical workers, and nursing care staff with high non-routine analytical and interactive and manual task scores rose, while the share of sales and service staff with low scores in these areas fell. Meanwhile, these changes were not so pronounced among male regular employees. As the occupational distribution of women changed significantly from 2005 to 2015, their ask scores also rapidly changed.

IV. Conclusion

In this study, we used the occupation matching data from the Japanese O-NET and the Population Census to examine task trends in the Japanese labor market from 1990 to 2015. As a result, the following points were clarified. First, non-routine analytical, interactive and manual tasks are increasing, while routine manual tasks are decreasing. Also, routine cognitive tasks, which increased until around 2000, have remained flat since



Note: Authors' calculations using data from the Population Census and Japanese O-NET.

Figure 6. Trends in task scores, by gender and employment status (2005–2015)

2005. Second, task trends differ depending on workers' characteristics such as gender, age, and employment status. On gender, the rate of increase of non-routine analytical, interactive and manual tasks among women is consistently higher than that among men from 1990 to 2015. Examining different age groups by gender, non-routine analytical and interactive tasks for young men decreased and routine manual tasks increased, a contrasting trend for overall and among middle-aged men. By employment status, since 2005 non-routine analytical and interactive tasks increased for regular employees and managers, while the same tasks decreased slightly among non-regular employees. This tendency is particularly pronounced among female regular employees.

This study observed the latest task trends from 1990 to 2015 by using task indicators from the Japanese O-NET. As a result, even with task indicators different from those of Ikenaga and Kambayashi, it became clear that there was growing "task polarization" in Japan from 1990 to 2015, with high-level and low-level non-routine tasks increasing while routine tasks decreased. In addition, this study showed new findings, such as different task distribution by workers' characteristics and changes in the trends in routine cognitive tasks around 2005. We will discuss these findings further below.

First, this study showed that task trends vary by workers' characteristics such as age and gender. The results clearly indicate that the change in task distribution for men was small while the increase in non-routine tasks for women was large, resulting in a greater task polarization among women. In addition, there were changes especially among middle-aged and older women and young men. In the context of an aging population and the growth of the service economy, the demand for agriculture and manufacturing jobs with predominantly manual tasks declined, which is counterbalanced by increased demand for medical and welfare service occupations that require non-routine tasks. Middle-aged and older women may have filled this demand. By contrast, younger men were less likely to be engaged in highly skilled tasks, such as non-routine analytical and interactive tasks, during the recession from the late 1990s through the mid-2000s. This suggests that young men did not have opportunities to obtain jobs with favorable conditions due to curtailing of new hires amid the economic downturn. The fact that task trends differ depending on workers' characteristics means that changes in the industrial structure have a non-uniform effect on workers. To examine changes in task distribution, demographic factors such as aging and increasing female employment and employment practices need to be taken into account instead of focusing only on technological innovations.

Second, this study showed that routine cognitive tasks were on the rise from 1990 to 2000, but have leveled off since 2005. In terms of specific occupations, even within the single major category of "clerical workers," the share of clerical workers that perform many advanced non-routine analytical and interactive tasks has risen, while the share of clerical workers who do not perform many of these tasks has fallen since 2005. DeLaRica and Gortazar (2016) pointed out that Japan has a higher degree of routine tasks than Western countries. Ikenaga and Kambayashi (2016) also pointed out that Japan's transition to IT has been more gradual than that of the United States. However, changing trends in routine cognitive tasks since 2005 suggest the possibility that highly routine occupations that involve few non-routine analytical and interactive tasks will decrease due to progress in the introduction of ICT (information and communications technology) and artificial intelligence in Japan.

Third, this study's use of task indicators differing from that of Acemoglu and Autor (2011) and Ikenaga and Kambayashi (2016) delivered some different results. While non-routine manual tasks decreased in the United States (Autor et al. 2003), we showed the tasks increased in Japan as in Ikenaga and Kambayashi (2016), despite the difference in measurements. However, we think that our measurements are appropriate because it conforms to the original definition of "non-routine manual tasks." Also, routine cognitive tasks increased from 1990 to 2000 in this study, unlike in Ikenaga and Kambayashi (2016), which showed a consistent decrease from 1965 to 2005. This is because the measurement of routine cognigive tasks is different from the one in Ikenaga and Kambayashi (2016). Their measurement for routine cognitive tasks is "skill with equipment and controls", which refers only to physical labor using machines, i.e. does not include clerical work, which is the reason for the consistent downward trend. However, as shown in Figure 2, unlike in the United States, the

share of clerical workers correlated with the increase of routine cognitive tasks from to1990 to 2000 in Japan. Thus, the upward trend of routine cognitive tasks from 1990 to 2000 in this article, which uses the same indicators as Acemoglu and Autor (2011), appears to be a reasonable finding.

The results of the analysis in this article suggest that it is important to develop and foster non-routine skills that are less likely to be replaced by ICT and AI than routine tasks. To that end, in addition to establishing a safety net for workers whose jobs are replaced by ICT or AI, public vocational training should be expanded, so that such workers can develop skills irreplaceable by ICT and AI.

We make it clear that the changes in task distribution were not the same between women and men in Japan. Future studies are required to reveal why the trends in task distribution differs according to gender and employment status, using more detailed individual data.

This paper is based on "Nihonban O-NET no suuchi Johou o shiyou shita ouyou kenkyu no kanosei" [Trends in Task Distribution in Japan: Evidence from the Occupational Information Network of Japan and the Population Census Data], JILPT Discussion Paper 21-11 (March 2021, in Japanese, https://www.jil.go.jp/institute/discussion/2021/documents/DP21-11.pdf) with additions and amendments in line with the gist of *Japan Labor Issues*.

Notes

1. For a theoretical framework of the task approach, cf. Autor et al. (2003), Acemoglu and Autor (2011), Acemoglu and Restrepo (2018).
2. DOT was first released by the US Department of Labor in 1939, and was revised in 1949, 1965, 1977, and 1991. When it was first released, it contained qualitative occupational information centered around tasks, but in subsequent revisions, other multifaceted quantitative data have been added, such as the length of training period, worker functions, physical requirements, working environment, GATB (General Aptitude Test Battery) benchmarks, personality, and interests (JILPT 2011).
3. O*NET was constructed to resolve the DOT's problem of the huge budget and time required to collect occupational information (Peterson et. al 2001). O*NET is an occupational information website operated by the US Employment and Training Administration, containing 923 occupations (as of March 2021).
4. Career Matrix was an occupational information website launched in 2006 by the Japan Institute for Labour Policy and Training (JILPT). The project was suspended in March 2011.
5. Autor et al. (2003) state that there is no clear relationship between IT introduction and non-routine manual tasks in terms of replacement or supplementation,.
6. The Japanese O-NET was developed with reference to O*NET in the United States, and information on jobs, tasks, skill requirements and knowledge, generalized work activities and so forth for about 500 occupations is provided online. Skill requirements, knowledge, generalized work activities, etc. for these occupations are quantified.
7. Quantitative information was collected between 2018 and 2021 through an online survey of workers conducted by the JILPT and a supplementary paper-based survey. In addition to the respondents' attributes (employment status, occupation, specific work contents, years of experience, etc.) for each occupation, data was collected on their "Occupational Interest," "Work Values," "Education and Training," "Skills," "Knowledge," "Work Context," and "Generalized Work Activities." As for the method of selecting occupations, details of survey contents and overall trends of respondents, etc., see JILPT (2020, 2021) and Kamakura et al. (2020)
8. As the Occupational coding system in the Population Census was revised in 2010, the occupational categories used in the Population Census from 1990 to 2005 are referred to as the old code, while the occupational categories used in the Population Census from 2010 to 2015 are referred to as the new code. At the same time, data on workers by gender from the 2005 Population Census, were retroactively tabulated with the new categories used in the 2010 census. Therefore, this study used new categories as well as old categories for the 2005 Population Census.
9. In the future, Japanese O-NET will regularly re-examine quantitative information for each occupation, which allows us to grasp changes in tasks within occupations.
10. In Acemoglu and Autor (2011), the non-routine manual task score for manufacturing process workers is as high as the routine manual task score, while the non-routine manual task score for service workers is not high. Autor et al. (2003) also pointed out a drawback of DOT in that the sample of service sector occupations is limited and important job skills are omitted, suggesting that these shortcomings of DOT are likely to reduce the precision of their analysis.
11. Top ten occupations requiring "skill with interpersonal support services" are public health nurses, midwives, judges/prosecutors/attorneys, teachers, physiotherapists and occupational therapists, dentists, and nurses. Also, the correlation between non-routine manual tasks and non-routine analytical and interactive tasks is high at 0.70 and 0.77. Therefore, we think that occupations in "interpersonal support services" require relatively advanced skills.
12. The Population Census has been inquiring about the employment status since 2000, but as the 2000 Population Census uses the old code, data from 2005 onwards was used in this study.

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KOMATSU Kyoko

Researcher, The Japan Institute for Labour Policy and Training (JILPT).
https://www.jil.go.jp/english/profile/komatsu.html

MUGIYAMA Ryota

Associate Professor, Department of Political Studies, Gakushuin University.

I. Main Labor Economic Indicators

1. Economy

The Japanese economy shows movements of picking up recently as the severe situation due to the Novel Coronavirus is gradually easing. Concerning short-term prospects, the economy is expected to show movements of picking up, supported by the effects of the policies and improvement in overseas economies while taking all possible measures against infectious diseases and continuing economic and social activities. However, full attention should be given to the further increase in downside risks due to the effects of the Novel Coronavirus and supply-side constraints and raw material prices. Also attention should be given to the effects of fluctuations in the financial and capital markets. (*Monthly Economic Report*,[1] January 2022).

2. Employment and unemployment

The number of employees in December was at the same level as the same month of the previous year. The unemployment rate, seasonally adjusted, was 2.7%.[2] Active job openings-to-applicants ratio in December, seasonally adjusted, was 1.16.[3] (Figure 1)

3. Wages and working hours

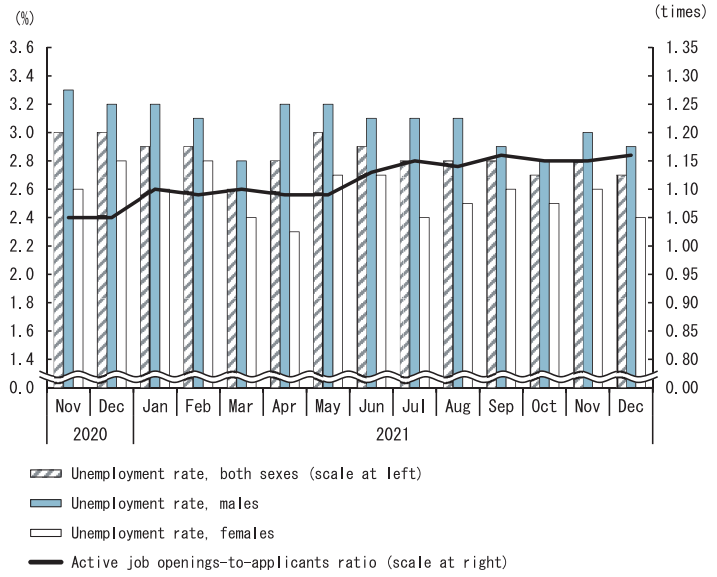
In December, total cash earnings decreased by 0.4% year-on-year and real wages (total cash earnings) decreased by 2.3%. Total hours worked increased by 1.1% year-on-year, while scheduled hours worked increased by 0.7%.[4] (Figures 2 and 6)

4. Consumer price index

In December, the consumer price index for all items increased by 0.8% year-on-year, the consumer price index for all items less fresh food increased by 0.5%, and the consumer price index for all items less fresh food and energy declined by 0.7%.[5]

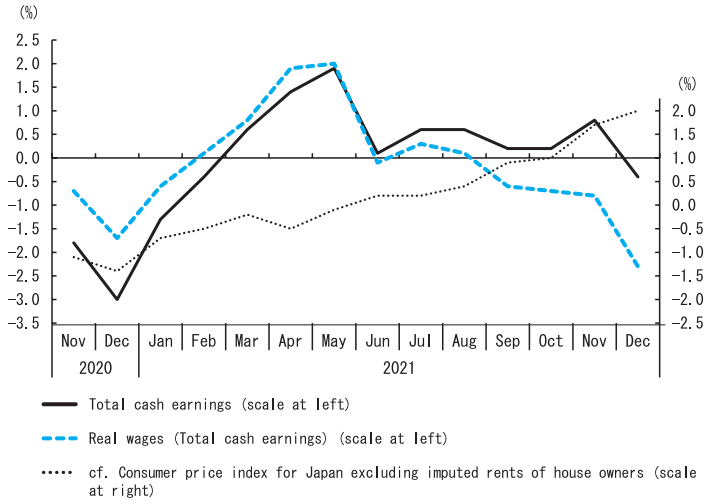
5. Workers' household economy

In December, consumption expenditures by workers' households increased by 3.1% year-on-year nominally and increased by 2.2% in real terms.[6]



Source: Ministry of Internal Affairs and Communications (MIC), *Labour Force Survey*; Ministry of Health, Labour and Welfare (MHLW), *Employment Referrals for General Workers*.
Note: Active job openings-to-applicants ratio indicates the number of job openings per job applicant at public employment security. It shows the tightness of labor supply and demand.

Figure 1. Unemployment rate and active job openings-to-applicants ratio (seasonally adjusted)



Source: MHLW, *Monthly Labour Survey*; MIC, *Consumer Price Index*.

Figure 2. Total cash earnings / real wages annual percent change

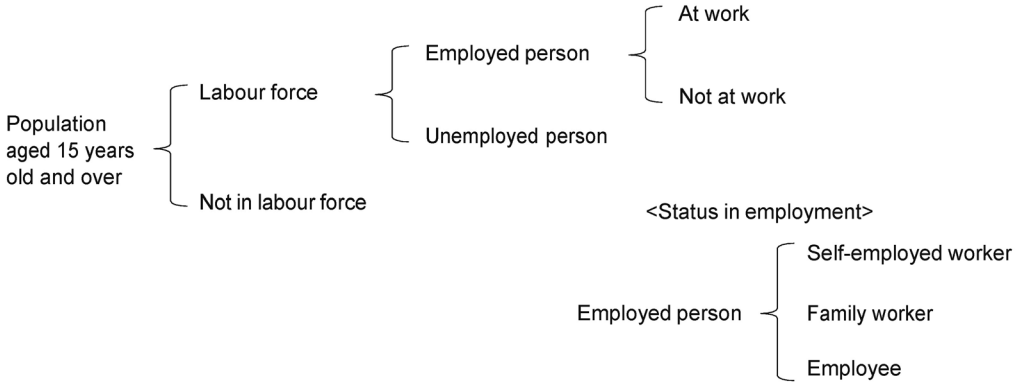
1. Cabinet Office, *Monthly Economic Report* analyzes trends in the Japanese and world economies and indicates the assessment by the Japanese government. Published once a month. https://www5.cao.go.jp/keizai3/getsurei-e/index-e.html
2. https://www.stat.go.jp/english/data/roudou/results/month/index.html
3. https://www.mhlw.go.jp/english/database/db-l/general_workers.html
4. For establishments with 5 or more employees. https://www.mhlw.go.jp/english/database/db-l/monthly-labour.html
5. https://www.stat.go.jp/english/data/cpi/index.html
6. MIC, *Family Income and Expenditure Survey*. https://www.stat.go.jp/english/data/kakei/index.html

II. Impacts of the COVID-19 pandemic on employment and unemployment

There are growing concerns that COVID-19's spread will have a significant impact on employment by retarding economic activity in Japan. The following outlines the recent trends shown in statistical indicators relating to employment. See JILPT website *Novel Coronavirus* (*COVID-19*) for the latest information (https://www.jil.go.jp/english/special/covid-19/index.html).

1. Employment and unemployment

(1) Definitions of *Labour Force Survey*



Source: Ministry of Internal Affairs and Communications (MIC), *Labour Force Survey*, Concepts and Definitions.[7]

(2) Labor force

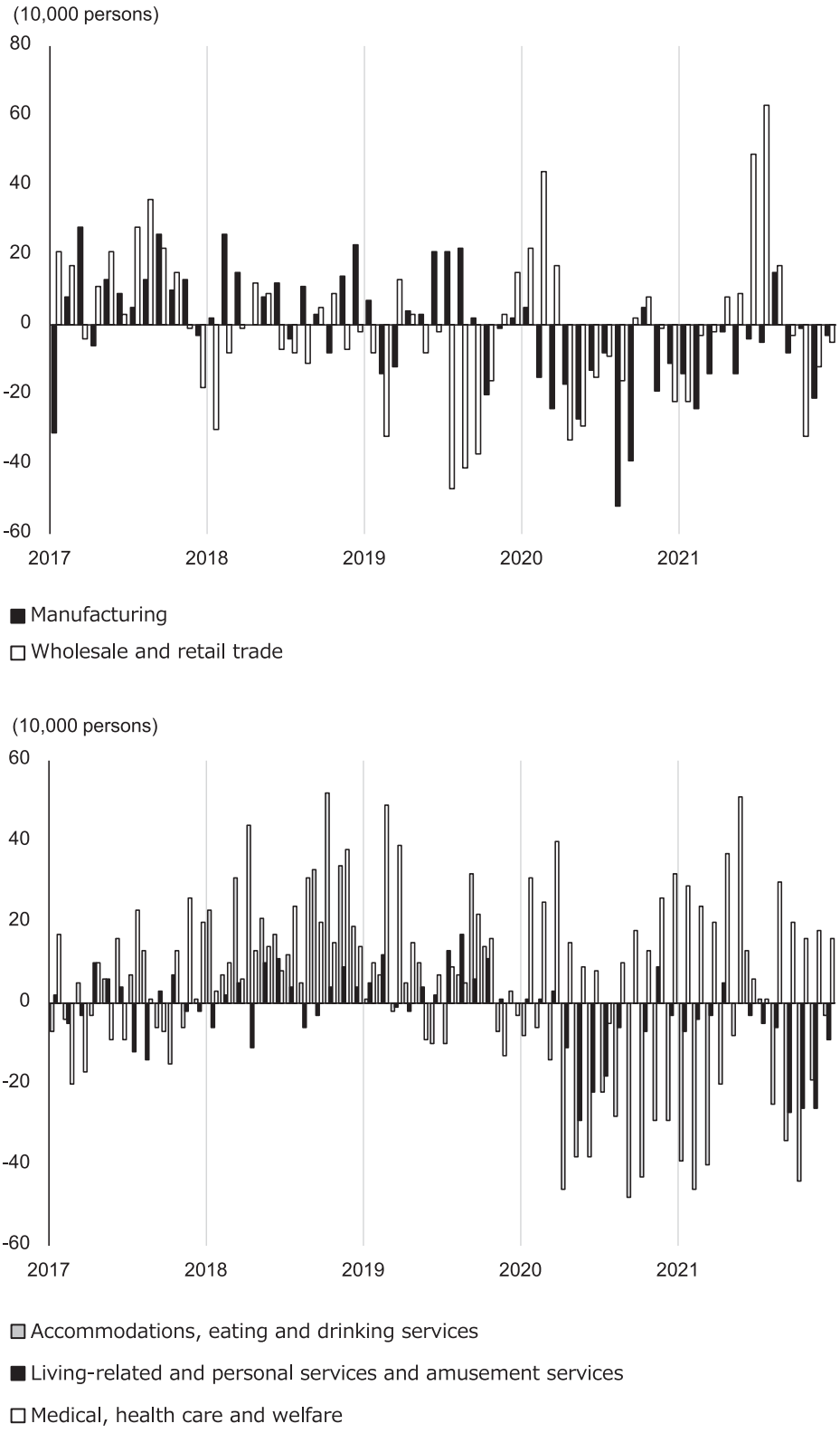
Table 1. Labor force

(10,000 persons)

		Labor force			
		Total	Employed person		Unemployed person
				Not at work	
2019		6,886	6,724	176	162
2020		6,868	6,676	256	191
2021		6,860	6,667	206	193
2020	December	6,860	6,666	202	194
2021	January	6,834	6,637	244	197
	February	6,840	6,646	228	194
	March	6,837	6,649	220	188
	April	6,866	6,657	199	209
	May	6,879	6,667	212	211
	June	6,898	6,692	182	206
	July	6,902	6,711	212	191
	August	6,886	6,693	248	193
	September	6,872	6,679	208	192
	October	6,842	6,659	164	183
	November	6,832	6,650	165	182
	December	6,831	6,659	189	171

Source: Compiled by JILPT based on Ministry of Internal Affairs and Communications (MIC), *Labour Force Survey* (Basic Tabulation) (unadjusted values).[8]

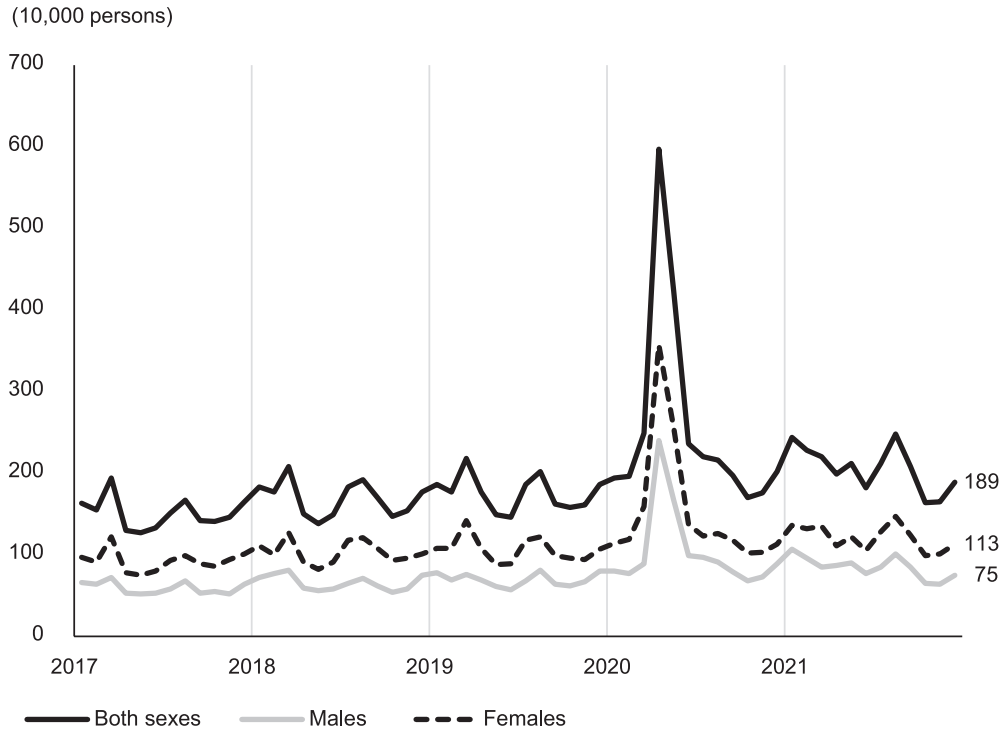
7. https://www.stat.go.jp/english/data/roudou/pdf/definite.pdf
8. For up-to-date information, see https://www.jil.go.jp/english/estatis/eshuyo/index.html (in English), for "employed person not at work" https://www.jil.go.jp/kokunai/statistics/covid-19/c23.html#c23-1 (in Japanese).



Source: Ministry of Internal Affairs and Communications (MIC), *Labour Force Survey* (Basic Tabulation).[9]

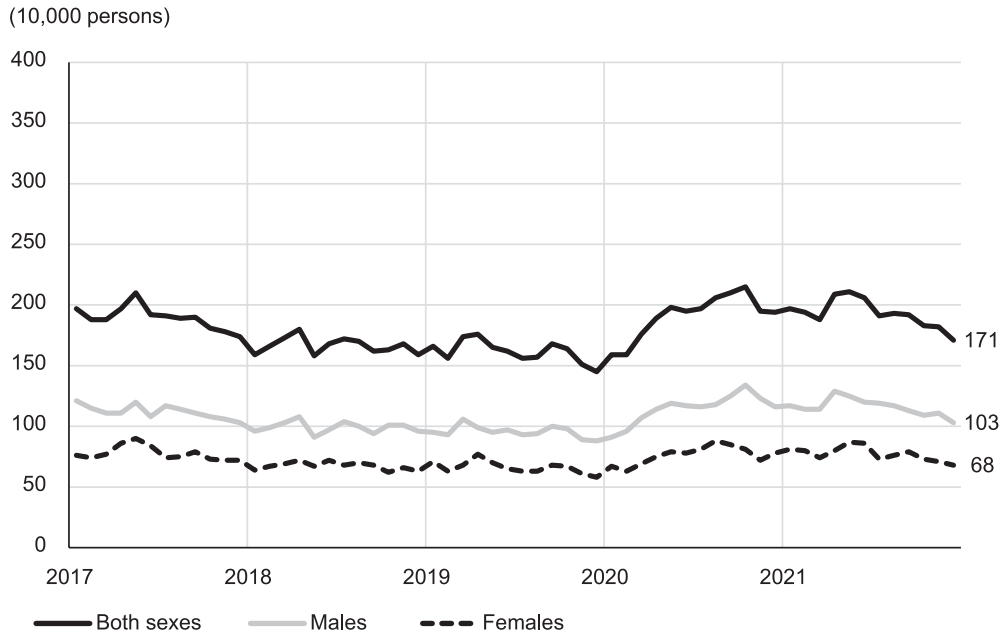
Figure 3. Number of employed persons by main industry (unadjusted values, year-on-year change) (January 2017 to December 2021)

9. For up-to-date information and further details, see https://www.jil.go.jp/kokunai/statistics/covid-19/c01.html#c01-7 (in Japanese).



Source: MIC, *Labour Force Survey* (Basic Tabulation).[10]

Figure 4. Number of employed persons not at work (unadjusted values, by sex) (January 2017 to December 2021)

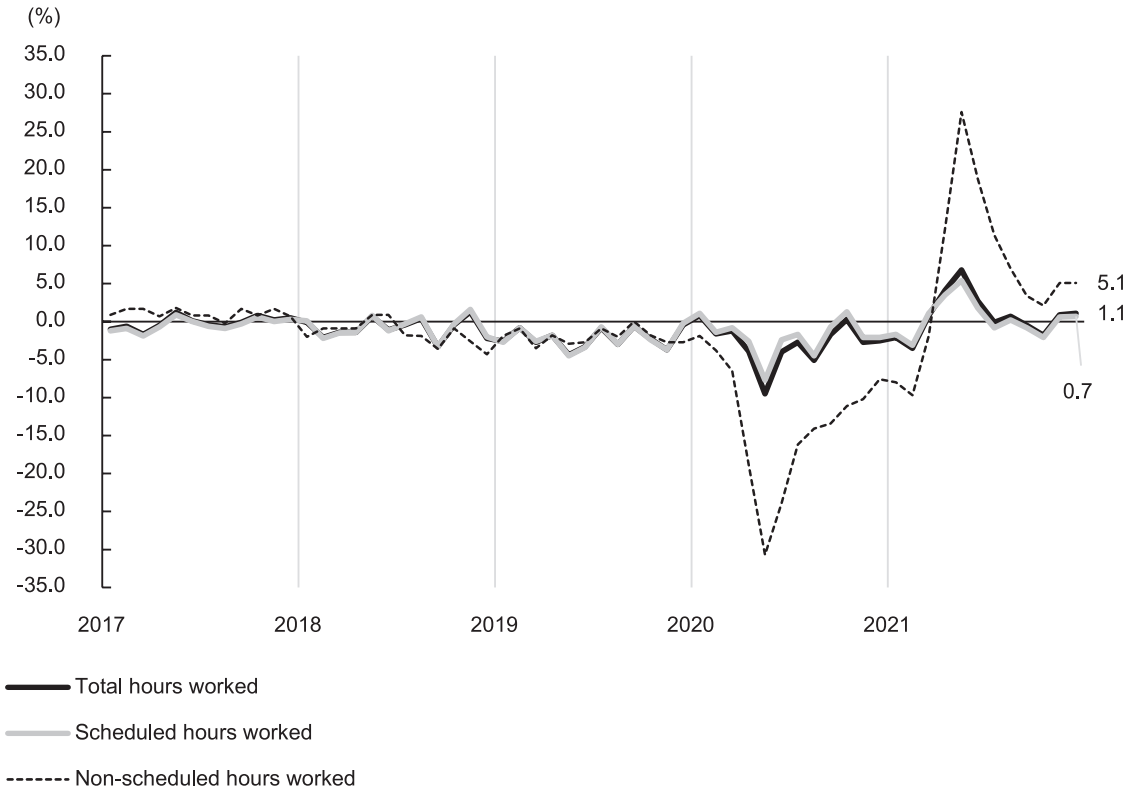


Source: MIC, *Labour Force Survey* (Basic Tabulation).[11]

Figure 5. Number of unemployed persons (unadjusted values, by sex) (January 2017 to December 2021)

10. For up-to-date information and further details, see https://www.jil.go.jp/kokunai/statistics/covid-19/c23.html (in Japanese).
11. For up-to-date information and further details, see https://www.jil.go.jp/kokunai/statistics/covid-19/c03.html#c03-1 (in Japanese).

2. Working hours



Source: Compiled by JILPT based on MHLW, "Monthly Labour Survey."[12]
Notes: 1. Beginning in June 2019, values are based on a complete survey of "business establishments with 500 or more employees."
2. "Business establishments with 500 or more employees" for the Tokyo metropolitan area are re-aggregated beginning in 2012.

Figure 6. Total hours worked, scheduled hours worked, and non-scheduled hours worked (year-on-year change, total of full-time employees and part-time workers) (January 2017 to December 2021)

For details for the above, see JILPT *Main Labor Economic Indicators* at https://www.jil.go.jp/english/estatis/eshuyo/index.html

12. MHLW, *Monthly Labour Survey.* https://www.mhlw.go.jp/english/database/db-l/monthly-labour.html. For up-to-date information and further details, see https://www.jil.go.jp/kokunai/statistics/covid-19/c11.html#c11-1 (in Japanese).

What's on the Next Issue

Japan Labor Issues

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tentative

●Trends

[Key topic]

▷ A Record 12.65% of Fathers in Japan Took Childcare Leave in 2020: MHLW's Basic Survey of Gender Equality in Employment Management

●Research

●Judgments and Orders

▷ Legality of Restrictions on Toilet Use for an Employee with Gender Dysphoria *The Country and National Personnel Authority (Ministry of Economy, Trade and Industry Staff)* Case, Tokyo High Court (May 27, 2021)

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