Column

Decreased Working Hours and Impact on Wages: A Look Back at the Novel Coronavirus's "First Wave" in Japan

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I. Introduction

In this column, I use individual data obtained from a questionnaire survey to identify the people whose working hours were reduced as a result of the novel coronavirus's "first wave" and analyze the degree to which their reduced working hours were linked with reduced wages.

When the state of emergency declaration was lifted nationally in late May 2020, complete statistical data showing the effects of the novel coronavirus's "first wave" on employment have finally become available.

According to the Ministry of Internal Affairs and Communications' *Labour Force Survey* released on May 29, the number of unemployed persons in April was 1.89 million, which was an increase of only 130,000 persons compared to the same month of the previous year. On the other hand, employed persons who did not work at all during the survey period numbered 5.97 million, which was an increase of 4.2 million compared to the same month of the previous year.[1] This situation contrasts with the recession that followed the global financial crisis of 2008, when the number of employed persons not at work was consistently below 1.5 million but the number of unemployed persons peaked at around 3.6 million.

Perhaps reflecting this increase in employed persons not at work, preliminary data provided in the Ministry of Health, Labour and Welfare's *Report of Monthly Labour Survey* released on June 9 show that the total of hours worked per person in April decreased by 3.7% compared to the same month of the previous year (total of surveyed industries).[2] It is also apparent from the first aggregation result of a questionnaire survey conducted by JILPT and RENGO's Research Institute for Advancement of Living Standards (RENGO-RIALS) (June 10)[3] that the largest of the "COVID-19-associated impacts on own employment and income" faced by employees of private companies in April and May was "decrease in workdays and working hours."[4]

Two questions arise here. The first is, who (including employed persons not at work) experienced a decrease in working hours? Looking at the number of hours worked per person in April (year-on-year comparison) in the preliminary data of the *Report of Monthly Labour Survey* by type of employment, there was a 2.6% decrease among "ordinary workers" (i.e., regular employees, etc.) and a 9.9% decrease among part-time workers. On the other hand, looking at this by industry, there was a decrease of 21.5% in "accommodations, eating and drinking services." A tendency whereby there are more persons with reduced working hours among part-time workers and in "accommodations, eating and drinking services" is also seen in the press release of the aforementioned joint research. However, if one thinks about it, "accommodations, eating and drinking services" comprise an industry that typically has many part-time workers. So then, which of "type of employment" and "industrial characteristics" is having the largest impact on working hours.

Secondly, if working hours decreased, what happened to the wages that should have been earned during those hours? Article 26 of the Labor Standards Act stipulates that an allowance for absence from

work must be paid at least 60% of average wage when a company puts employees on leave for a reason "attributable to the Employer"[5] However, in actuality, while some companies pay this amount or more, some probably cannot. Moreover, although subsidies such as the Employment Adjustment Subsidy exist to supplement allowances for absence from work, it is unlikely that all companies have mastered the application procedures for them. Naturally, the circumstances of workers who receive hourly wages and those of workers who receive monthly wages differ. It is also probable that some companies scaled back the number of persons who come to work by making employees take paid leave. At any rate, how working hours and wages are linked is an empirically open question.

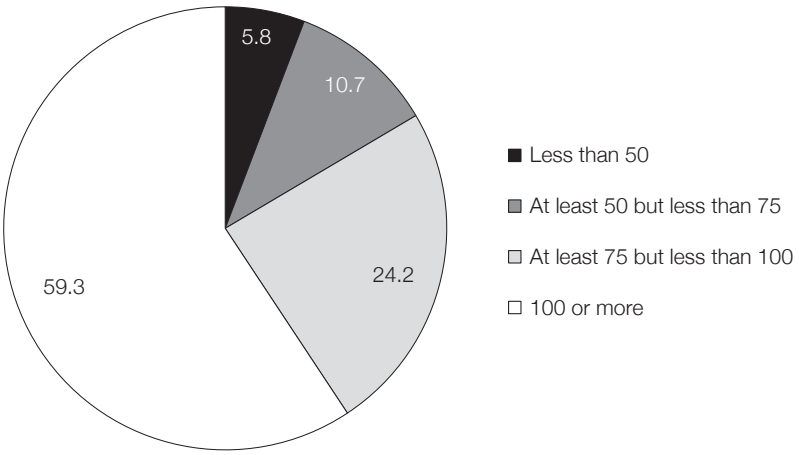
II. Survey and data outline

The survey is called the "Survey on the Impact that Spreading Novel Coronavirus Infection has on Work and Daily Life," which was conducted as part of the aforementioned joint research. It was sent to "employees working at private companies" and "people working in freelance" among persons registered with an internet survey company who are aged at least 20 years old but no more than 64 years old and who were residing in Japan as of April 1, 2020.[6] The survey period was May 18 to 27, 2020.

Here I will conduct two analyses that correspond to these two questions. The applied data is individual data from this questionnaire survey. The focus of the analysis in this column is the total of 4,178 survey respondents who were employed at a private company on April 1 and who continued to work at the same company at the time of the survey.[7] Accordingly, note that "employed persons not at work" are included in the scope of analysis, but persons who separated from employment during the period mentioned are not.[8]

III. Whose working hours decreased?

The survey asked about hours worked per week for each of "a normal month prior to the emergence of the novel coronavirus problem (hereinafter, the normal month)," "the second week of April (April 6 to 12), and "the second week of May (May 7 to 13)." From the results, I obtained an "index of change in working hours under the coronavirus's effects compared to the normal month (no change=100)" by dividing the average of hours worked for the second week of April and second week of May (class value) by the hours worked per week for the normal month (class value).[9] The average is 89.9, with distribution shown as in Figure 1. From this, it is apparent that



Note: Values were obtained by dividing the average of hours worked in the second week of April and second week of May by the weekly hours worked of the normal month (the value is 100 when there was no change in April/May in comparison with the normal month).

Figure 1. Index of change in working hours under the coronavirus's effects compared to the normal month (N=4,178, %)

Table 1. Determinants of the index of change in working hours under the coronavirus's effects compared to the normal month (OLS)

Explained variable: Index of change in working hours	Model 1		Model 2		Model 3		Model 4	
	Coefficient B	S.E.	Coefficient B	S.E.	Coefficient B	S.E.	Coefficient B	S.E.
Females	−2.891	0.700**					−2.252	0.774**
Breadwinners	0.835	0.724					0.061	0.733
(Regular employees)								
Part-time workers			−4.632	0.730**			−0.306	0.899
Contract workers and *shokutaku* (entrusted workers)			−1.298	1.253			−0.017	1.241
Dispatched workers			−6.902	1.765**			−6.344	1.779**
Administrative and managerial workers					2.395	1.186*	0.548	1.263
Professional and engineering workers					1.608	0.944	0.417	0.981
(Clerical workers)								
Sales workers					−3.497	1.069**	−4.575	1.096**
Service workers					−3.766	1.217**	−4.525	1.241**
Security workers					4.200	4.243	2.296	4.265
Production/skilled workers					−1.809	1.306	−2.709	1.332*
Transport and machine operation workers					−0.023	2.400	−1.479	2.418
Construction and mining workers					−1.184	3.332	−2.911	3.351
Carrying, cleaning, and packaging workers					0.030	1.713	−0.813	1.753
Others					−0.946	1.805	−1.696	1.833
Do not know					−0.384	2.743	−1.098	2.750
Construction					1.985	1.575	2.248	1.572
(Manufacturing)								
Electricity, gas, heat supply and water					5.413	2.451*	5.611	2.447*
Information and communications					0.523	1.491	0.606	1.489
Transport					−0.601	1.687	−1.003	1.686
Wholesale and retail trade					−1.285	1.225	−0.785	1.241
Finance and insurance					−3.506	1.528*	−2.835	1.531
Real estate					−4.360	2.121*	−4.448	2.117*
Eating and drinking places, accommodations					−13.695	1.909**	−13.072	1.937**
Medical, health care and welfare					3.756	1.160**	4.294	1.175**
Education, learning support					−7.674	1.867**	−7.130	1.894**
Postal services, cooperative associations					6.230	3.301	6.572	3.301*
Services					−8.280	1.195**	−8.007	1.200**
Other business categories					−1.775	1.749	−1.168	1.756
Do not know					2.123	4.923	0.779	4.922
(1,000 or more employees)								
100–999 employees					1.010	0.829	1.076	0.827
99 or fewer employees					0.978	0.802	1.123	0.806
Do not know					0.514	1.156	1.724	1.190
Constant	90.718	0.741**	91.299	0.372**	91.360	1.037**	93.009	1.282**
N		4178		4178		4178		4178
F-value		15.058**		16.929**		12.099**		11.119**
Adjusted R^2		0.007		0.011		0.069		0.074

Note: **: $p<0.01$, *: $p<0.05$. Parentheses indicate reference groups.

nearly 60% of workers did not experience a decrease in working hours, but there were some workers, at the 10% to 20% levels, whose working hours were less than three-fourths compared to the normal month.

Then, who among workers experienced larger decreases in their working hours? Here, I will use the

OLS method by setting the aforementioned "index of change in working hours" as the explained variable and (i) "personal attributes" (female dummy, breadwinner dummy), (ii) "type of employment," and (iii) "occupation, industry, and size of enterprise" as explanatory variables. Table 1 shows the results.

The coefficient B shows how much higher or lower the index of change in working hours is, compared to the reference groups. For example, if the coefficient of an industry is "−5," this signifies that, in the case of that industry, the amount of decrease in working hours compared to the normal month is 5 percentage points larger than "manufacturing" that is the reference group.

For Model 1, I inputted (i) "personal attributes" only. From this, it can be seen that working hours decrease more for females, and that whether or not a person is the household's breadwinner does not affect the amount of decrease in working hours.

For Model 2, I inputted (ii) "type of employment" only. From this, it can be seen that the amounts of decrease in working hours are large for part-time workers and dispatched workers (in comparison with regular employees). On the other hand, the working hours of full-time directly-employed non-regular employees—specifically, contract workers and *shokutaku* (entrusted workers) —do not appear to be significantly affected.

For Model 3, I inputted (iii) "occupation, industry, and size of enterprise" only. From this, it can be seen that, in terms of occupation, the amounts of decrease in working hours are large for "sales workers" and "service workers"; that, in terms of industry, decreases in working hours are particularly large in "eating and drinking places, accommodations," "education, learning support," and "services"; and that, conversely, the decrease in working hours is small in "medical, health care and welfare" (in comparison with other business categories). It should be noted that "size of enterprise" does not strongly influence amounts of decrease in working hours.

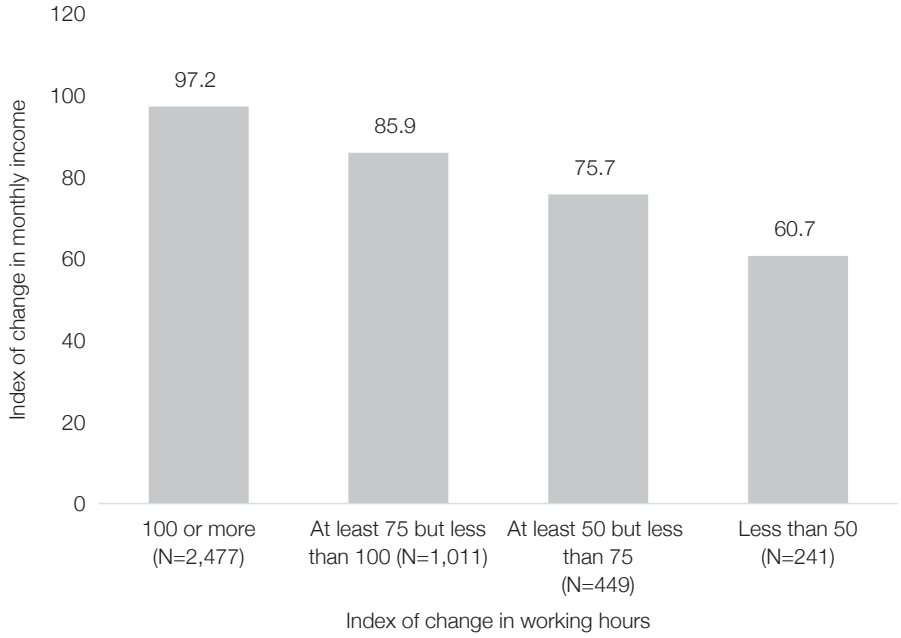
For Model 4, I inputted all of the variables (i), (ii), and (iii). One point that deserves attention here is that the coefficient for part-time workers loses significance. In other words, the working hours of part-time workers are not necessarily susceptible to decreases when sex, occupation, and industry are controlled. Of course, the explained variable I am using here is the "index of change in working hours" for persons who have not left employment, and it goes without saying that, in reality, a not insignificant number of part-time workers left employment during the novel coronavirus's "first wave" (see the addendum). A second point is that the amount of decrease in working hours is large for women, even when various variables are controlled. In-depth research and discussion will be needed on the mechanisms by which working hours are adjusted in workplaces and households. And a third point is that, looking at coefficient sizes, industry has a generally strong influence on the index of change in working hours. That the novel coronavirus's "first wave" made a concentrated attack on certain industries through voluntary business suspensions, etc., is clear from this.

IV. Decreased working hours and decreased wages

The previous section is an analysis to find out who had larger decreases in their working hours. In this section, my analysis will look at how far wages decrease when working hours decreased to certain degrees. The survey asked respondents, "How does your most recent monthly income compare to what your original (normal) monthly income was before the emergence of the COVID-19 problem?" Here, I consider the class value of their responses to be an "index of change in monthly income" (no change = 100) and show the relationship between the index of change in working hours and index of change in monthly income.

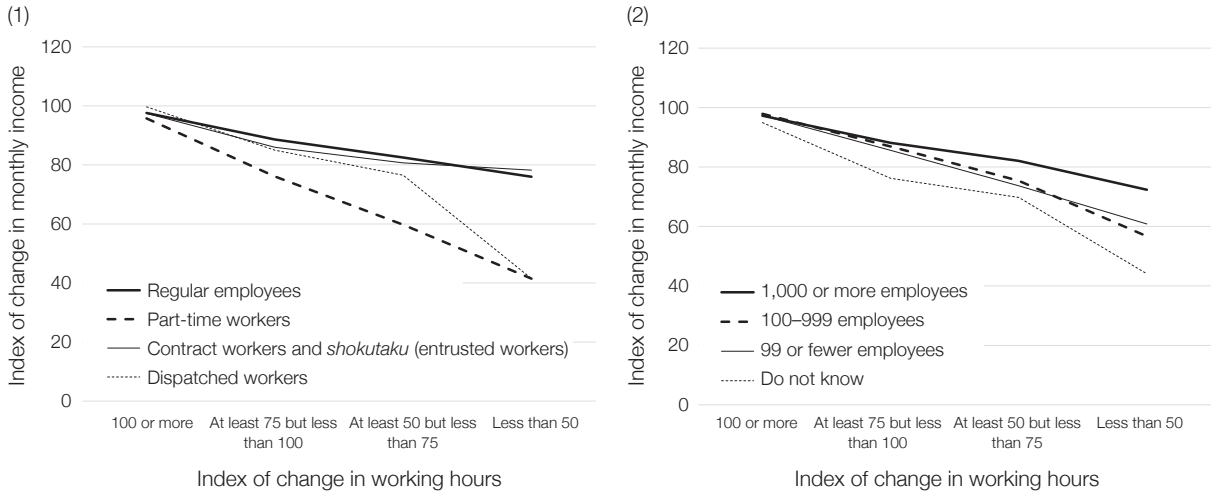
Figure 2 shows the relationship between both variables for all respondents covered by the analysis. As one might expect, it can be seen from this that when persons experienced a significant decrease in working hours, they also experienced a proportionally significant decrease in monthly income.

On the other hand, Figure 3 shows the two variables' relationship by type of employment and by the size of enterprise. Looking at an analysis by each "type of employment" category of (1), it can



Note: "No change = 100" for both "index of change in working hours" and "index of change in monthly income."

Figure 2. Relationship between "index of change in working hours" and "index of change in monthly income" (all analyzed respondents)



Note: "No change = 100" for both "index of change in working hours" and "index of change in monthly income."

Figure 3. Relationship between "index of change in working hours" and "index of change in monthly income"

be seen that, for regular employees and contract workers and *shokutaku*, the decrease in wage is gradual against the decrease in working hours. The index of change in monthly income's decline stops at about 80 even when the index of change in working hours falls below 50. However, in the cases of part-time workers and dispatched workers, the decrease in working hours brings a straighter decrease in wages. This is likely related to differences in wage systems, as regular employees, contract workers, and *shokutaku* often have a monthly wage system and part-time workers and dispatched workers often have

an hourly wage system.

Looking at an analysis by each "size of enterprise" category of (2), it can be seen that, in the case of large enterprises with 1,000 employees or more, the decrease in wage is more gradual against the decrease in working hours compared to enterprises with 999 or fewer employees. Presumably, this is related to large enterprises' having reserves to pay sufficient allowances for absence from work and their having mastered the application procedures for the Employment Adjustment Subsidy and other programs. Their application of paid leave to cope with short-term suspensions of business or operations may also have had something to do with this. Even more noteworthy is that decreased working hours are most straightly linked to decreased wages for workers who responded that they "do not know" the size of their enterprise. One possible reason for this is that non-regular employees often do not know how large their enterprises are. An additional consideration may be the possibility that wages are not being compensated when working hours are curtailed in companies that lack the inclination or ability to disclose information to their workers.[10]

V. Conclusion

Speaking abstractly, labor research is all about analyzing wages as compensation for working hours. However, I would add with some self-admonition that the perspective of "losing working hours" tends to be overlooked in our daily research even when we are conscious of "losing employment or work." Moreover, the question of whether or not lost working hours lead directly to decreased wages is not always considered.

In this column, I intended to get back to the perspective of "losing work hours." I focused on how the effects of the novel coronavirus's "first wave" appeared in the form of decreased working hours, such as through increased numbers of employed persons who are not at work (in contrast to the recession that followed the global financial crisis of 2008).

As a result, it became clear that lost working hours during the "first wave" were concentrated in a number of industries, among them "eating and drinking places, accommodations"; that working hours were lost more often by females than by males; and that decreased working hours tended to link directly to decreased wages for part-time workers, dispatched workers, and workers in SMEs.

That being said, the scope of this column is limited to a partial analysis that was conducted based on a single questionnaire survey of registered respondents. I therefore hope that, by serving as a springboard for discussions and further analyses, it will help advance appropriate employment and labor policy for the "second wave" and later waves as well as the post-coronavirus era.

Addendum: Determinants for leaving job

I mentioned in the main text that the working hours of part-time workers are not necessarily susceptible to decreases. However, according to the *Labour Force Survey* of April, 2020, there was a 630,000-person increase in the number of regular employees compared to the same month of the previous year, but a 770,000-person decrease in the number of part-time workers. Naturally, attention must be paid to part-time workers who left employment.

With this in mind, I attempted an analysis, using the same survey data presented in this column, for the 4,307 persons who were employed at a private company on April 1. I conducted a binomial logistic regression analysis by setting "whether or not a person was without work at the time of the survey" as the explained variable and using the same explanatory variables presented in Model 4 of Table 1 (determinants of the index of change in working hours). The results indicated that part-time workers and dispatched workers were susceptible to leaving job with a 1% level of significance (compared to regular employees) (Table 2). It deserves noting that neither the industry dummy nor the size of enterprise was significant at the 5% level. Likewise, for the occupation dummy, only "do not know" was significant at the 5% level. This contrasts with the finding that the index of change in working hours was strongly influenced by industry.

Table 2. Determinants for leaving job (binomial logistic regression model)

Explained variable: Have left job = 1	Coefficient B	S.E.
Females	−0.121	0.351
Breadwinners	−0.325	0.327
(Regular employees)		
Part-timer workers	1.478	0.404**
Contract workers and *shokutaku* (entrusted workers)	0.580	0.654
Dispatched worker	1.686	0.621**
Occupation	[Dummy variables are inputted]	
Industry	[Dummy variables are inputted]	
Size of enterprise	[Dummy variables are inputted]	
Constant	−5.851	0.811**
N		4307
Chi-square		95.837**
Nagelkerke R^2		0.163

Note: **: p<0.01, *: p<0.05. Parentheses indicate reference groups.

In any case, a more precise implication concerning part-time workers that can be drawn from the results of this analysis is that "part-time workers have a high probability of quitting job, but those who continue working for the same company are not especially susceptible to experiencing decreases in working hours."[11]

However, generally speaking, it is thought that non-regular employees would be more likely to be without work even if there is not the novel coronavirus crisis. Therefore, I will add that not all of the analysis results presented here were brought by the novel coronavirus crisis.

The views and recommendations of this paper are the author's and do not represent those of the Japan Institute for Labour Policy and Training. I wish to thank the persons concerned of RENGO-RIALS and JILPT for their cooperation and permission in connection with my analyses of the questionnaire survey and publication of this column. In particular, I extend my gratitude to Ms. Yuko Watanabe of JILPT, who compiled the first aggregation result of the survey, for her advice to my analyses. However, I assume complete responsibility for this column's content and any errors it may contain.

1. For details, see Masayuki Nakai, "Shingata korona no rodo shijo inpakuto: Shitsugyo-sha wa bizo da ga kyugyo-sha wa gekizo shi, katsuyo rodo-ryo wa ichi-wari no gensho" [The novel coronavirus's impact on the labor market: The number of unemployed persons has risen slightly, but the number of employed persons not at work has risen substantially and the amount of utilized labor has fallen by 10 percent] published May 29, 2020. https://www.jil.go.jp/tokusyu/covid-19/column/012.html (in Japanese).

2. While the translation of this report was in progress, the total of hours worked per person in May announced to be decreased by 9.0% compared to the same month of the previous year. In aggregation for the *Monthly Labour Survey*, persons who are in the service of a surveyed establishment and whose salary was calculated during the survey period are included even if they did not attend work during the survey period.

3. See JILPT (2020) Results of the "Survey on the Impact that Spreading Novel Coronavirus Infection has on Work and Daily Life" (May Survey, a follow-up survey coupled with the respondents of April Survey) (First Aggregation) at https://www.jil.go.jp/english/special/covid-19/survey/documents/20200610.pdf (in English) or https://www.jil.go.jp/press/documents/20200610.pdf (in Japanese).

4. From the same press release, it can be seen that respondents indicating that their approximate weekly working hours were "40 hours or more" decreased and respondents indicating "under 20 hours (including "did not work")" increased in comparison with a normal month prior to the emergence of the COVID-19 problem.

5. It should be noted that the concept of "leave" as it is used here refers to "an inability to work during a period when one is under a duty to work determined by a labor contract" and thus differs from the concept of "employed person not at work" in the *Labour Force Survey*. See Kazuo Sugeno, *Rodoho* [Labor law], 12th ed. (Tokyo: Kobundo, 2019), 457.

6. For "employees of private enterprises," stratified sampling method was applied, so that respondents are proportionally represented in the subgroups of sex, age group, residential region block, and regular/non-regular employee status, based on the *Employment Status Survey*.

7. To be precise, one person who satisfied this condition did not provide a response for the number of weekly hours worked for "normal month prior to the emergence of the novel coronavirus problem" and was therefore excluded from the analysis.

8. However, I provide an analysis that includes *rishokusha*, or persons who were working a month ago, but quitted that job and are not working at present, in the addendum at the end of this column.

9. Due to the survey's design, following should be noted: The employed persons not at work in the second week of April (zero hours worked) selected the response "Less than 15 hours." The employed persons not at work in the second week of May selected that of "Did not work."

10. I conducted a similar analysis as a trial by extracting only part-time workers. In comparison with large enterprises with 1,000 or more employees, the amounts of decrease in wages were relatively large for enterprises with 999 or fewer employees and the "do not know" size of enterprise category even when the decreases in working hours were roughly the same.

11. While this becomes a theoretical discussion, ultimately, the problem boils down to the procedure by which companies make decisions. Specifically, does the company (i) first decide whether or not it will dissolve employment relationships (i.e., Whose employment relationship will be dissolved?) and then decide the working hours of remaining workers, or (ii) first decide the degree to which working hours will be decreased (Whose working hours will be decreased?) and then decide whether or not to dissolve employment relationships (Whose employment relationship will be dissolved?) when it can no longer maintain its business with decreased working hours? If (i) is the stronger aspect, then the analysis results presented in Table 2 have greater meaning. However, in this column, I considered (ii) to be the stronger aspect amid the novel coronavirus's "first wave." I therefore decided to make the analysis of Table 1 the column's main focus and leave Table 2 to the addendum.

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