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Expansion of Disparities During the COVID-19 Pandemic

- The Income Gap and the Digitalization Gap –

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The current wave of globalization has starkly highlighted an expanding global income gap and the stagnation of the middle-income bracket. Japan is no exception. The shock of the COVID-19 pandemic appears to have significantly expanded economic and digital disparities. This tendency was reflected in the results of the "Questionnaire Survey on the Effects of the Spread of COVID-19 on Telework-based Work Styles, Lifestyle, and Awareness," two of which were conducted by Toshihiro Okubo of the Keio University and NIRA.

The COVID-19 pandemic has not only caused an economic recession, but has also sparked a wave of technological innovation, which may lead to a further expansion of disparities. The background to this might be the fact that the use of telework is linked to economic disparities. That is, while high-income workers and large corporations actively use telework and digital tools, which will increase their productivity in the future, lower-income strata and small and medium-sized enterprises are not riding the wave of digitalization. As a result, economic disparities are becoming more conspicuous due to the existence of digital disparities.

Introduction

The recession caused by the COVID-19 pandemic differs from previous economic recessions in that digitalization is proceeding rapidly as a measure to prevent the spread of the virus. Up to the present, it has commonly been argued that artificial intelligence (AI) would gradually steal jobs, and that certain occupations would ultimately disappear; however, the current wave of digitalization has appeared all of a sudden in the COVID-19 pandemic, and it is rapidly engulfing us amid an economic recession. This wave of digitalization will change the future Japanese economy.

Based on data obtained from NIRA's "Questionnaire Surveys on the Effects of the Spread of COVID-19 on Telework-based Work Styles, Lifestyle, and Awareness", this paper examines the most recent state of the Japanese economy, and considers relevant policy issues.

Globalization and Income Disparity

After the Second World War, free trade became a global trend. The theoretical pillar that supported the promotion of free trade was the concept of "comparative advantage" in traditional international trade theory. What this means is that a nation's export industry increases its profits by specializing in the industries in which that nation is relatively strong. The same nation's import industry might be hit by cheap imported goods, but the fact that all consumers are able to buy many cheap goods is an enormous advantage for the society overall. Free trade therefore represents a positive benefit for the nation as a whole, and all that is then needed is to implement an appropriate distribution policy across industries within the nation.

However, more recently, the globalization of production, i.e. the creation of global value chains, has caused major changes in the assumptions on which traditional international trade theory rested. As the division of labor at task level and production process level has spread across the world, the distinction between export and import industries has now become increasingly vague. Income disparities between occupations rather than between export and import industries have expanded, and it has become difficult to implement distribution policies as was previously the case. Domestic economic disparities consequent upon economic globalization is therefore a significant issue today.

Recent trade theory (i.e. trade theory that encompasses firm heterogeneity) focuses on the fact that productivity varies greatly across firms. Only an extremely small percentage of high-productivity firms can export products and benefit from trade liberalization. Low-productivity micro-enterprises, by contrast, in addition to not being able to export their products, are exposed to fierce competition from overseas imports. Profits therefore decline for low-productivity firms, and they exit the market. Broadly speaking, profits are shifting from small to large firms in the wave of globalization.

Globalization has made significant advances, but at the same time, profits for SMEs, and wages for the middle class and for unskilled workers have declined. Wealth is

concentrated with a small number of large firms and high income earners, and the frustration of the middle class whose wages are declining is accelerating the drift towards protectionism and a nation-first orientation. This trend is also gradually becoming apparent in Japan. Japan was once thought of as a homogenous society in which "everyone is middle class," and lifetime employment and seniority-based wages were the social norm. However, with the advance of globalization over the past 20 to 30 years, the nation's mass manufacturing production base has shifted to Asia, and domestically it has long been suffering from the hollowing out of its industry. Like other developed countries, wages among workers in the SMEs and micro-enterprises and the unskilled workers that form the middle stratum have continued to stagnate, and disparities are steadily expanding.

The actual status of these disparities was clarified by the surveys of the status of approximately 12,000 workers amid the COVID-19 crisis conducted by Toshihiro Okubo of the Keio University and NIRA[1].

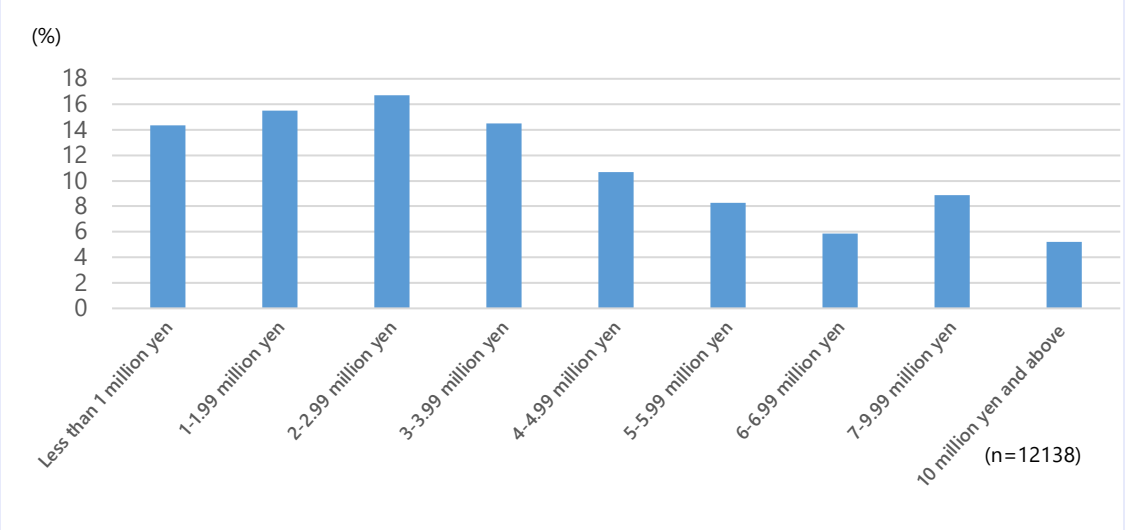
"Everyone is Middle Class" in Japan is a Story of the Past

We will look first at the income distribution among workers as demonstrated by the surveys. Figure 1 shows the distribution of income among workers in terms of income brackets. The distribution is rather skewed towards the lower-income bands. This reality is far from a homogeneous society in which "Everyone is middle class."[2]

[1] The survey was conducted twice, once in April (before the declaration of the state of emergency) and once in June (following the declaration of the state of emergency). The questionnaire survey and data analysis were conducted by Toshihiro Okubo, Kiwamu Kato, Senior Architect for Future Corporation, and Atsushi Inoue, Kozue Sekijima, and Hironari Masuhara of NIRA.
OKUBO, Toshihiro and NIRA (2020), "Results of a Second Questionnaire Survey concerning the Impact of the Use of Telework to respond to the Spread of COVID-19 on Working Styles, Lifestyles, and Awareness (and Preliminary Report)" https://www.nira.or.jp/outgoing/report/entry/n200805_983.html, https://www.nira.or.jp/outgoing/report/entry/n200630_976.html
OKUBO, Toshihiro and NIRA (2020), "Results of a Questionnaire Survey concerning the Impact of the Use of Telework to respond to the Spread of COVID-19 on Working Styles, Lifestyles, and Awareness (and Preliminary Report)"
https://nira.or.jp/outgoing/report/entry/n200430_965.html
https://nira.or.jp/outgoing/report/entry/n200417_963.html

[2] There is almost no bias in the income distribution in the surveys under discussion even when compared to the Employment Status Survey (2017).

Figure 1　Income distribution among survey subjects



Source: Formulated by the author from "Results of a Second Questionnaire Survey concerning the Impact of the Use of Telework to respond to the Spread of COVID-19 on Working Styles, Lifestyles, and Awareness" (Okubo and NIRA, August 2020). All figures below are formulated using the same source.

In order to explore the background to these results, we will look at the composition of survey subjects in each income bracket in terms of industry, occupation (manufacturing industry only), and firm size.

First, Figure 2 shows the composition of workers by industry. Overall, 17% were employed in the manufacturing industry, 12% in the wholesale/retail sectors, 11% in medical care and welfare, 7% in information services, and 7% in banking and finance. Approximately 70% of the Japanese survey subjects were employed in service industries[3]. On the other hand, when we consider incomes by bracket, we find that the manufacturing industry accounts for 20% or more in the brackets from an annual income level of 5 million yen or more. It seems, therefore, that workers in the manufacturing industry have maintained medium to high income levels, and manufacturing firms still guarantee income and employment to a certain extent. By contrast, the percentages become higher in wholesale/retail, restaurant and accommodation, and other services, and this corresponds to lower income. The number of employees in these industries has increased in recent years, demonstrating that job opportunities are concentrated in these industries, which offer relatively low wages.

[3] There is almost no bias with regard to the ratios of workers by industry in the surveys under discussion even when compared with the Employment Status Survey (2017).

Figure 2　Makeup of survey subjects by industry for individual income brackets

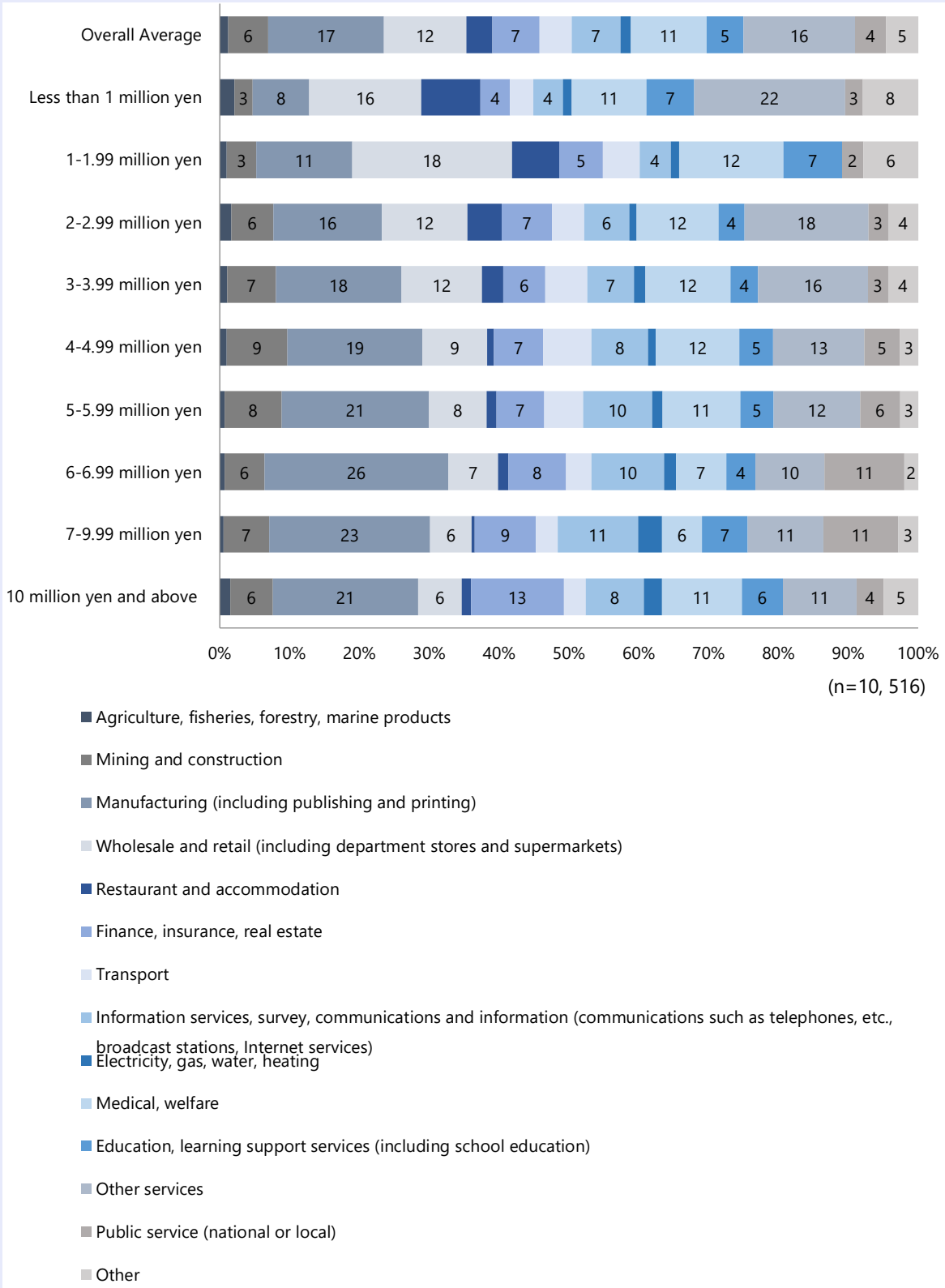


Figure 3 shows the relationship between income bracket and occupation, with a focus on the manufacturing industry. For the manufacturing industry, the higher the income bracket, the higher the percentage of management-level occupations represented in that bracket. At an annual income of 10 million yen and above, management-level occupations represent 64% of the total. By contrast, as the income level declines, the percentage of production process workers increases, reaching 30-38% at an income level of up to three million yen per year. A noteworthy feature is the fact that office workers represent between 21 and 35% of workers in all income brackets up to 10 million yen per year; the level of variation between income levels here is comparatively low.

Figure 4 looks at the size of the firms with which workers were employed, categorized by income level. As the income level increases, the percentage of large corporations goes up, and, by contrast, the percentage of SMEs tends to decline.

Figure 3 Occupational makeup of workers by income level in manufacturing industry

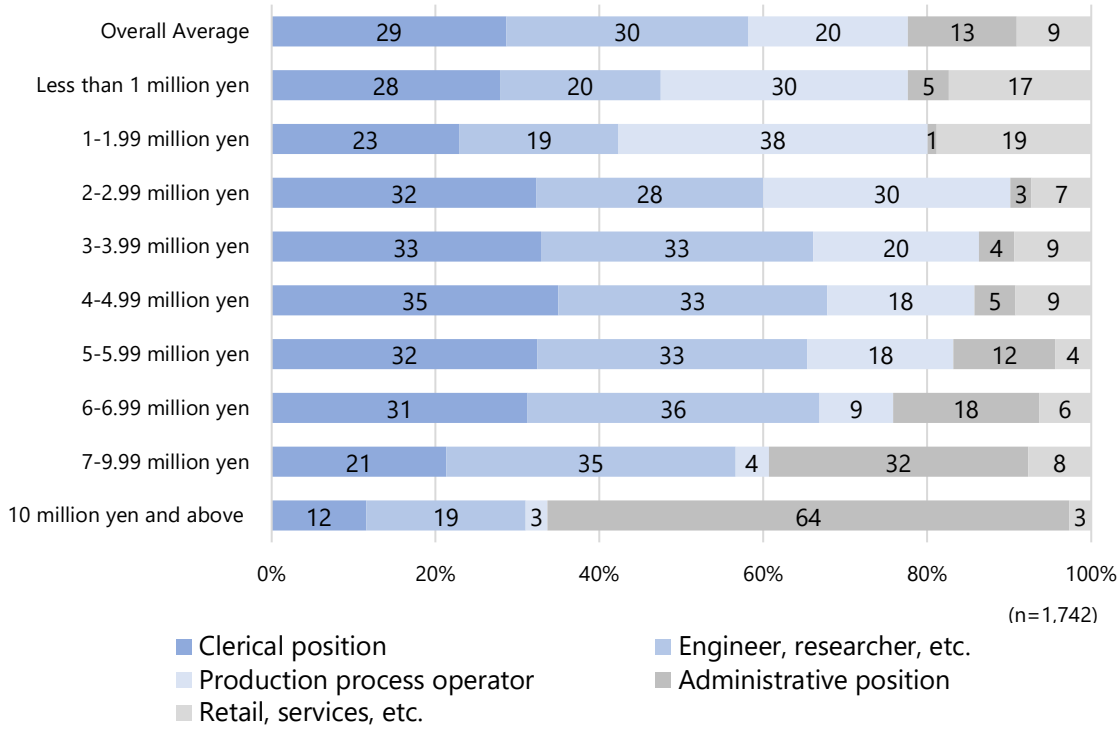
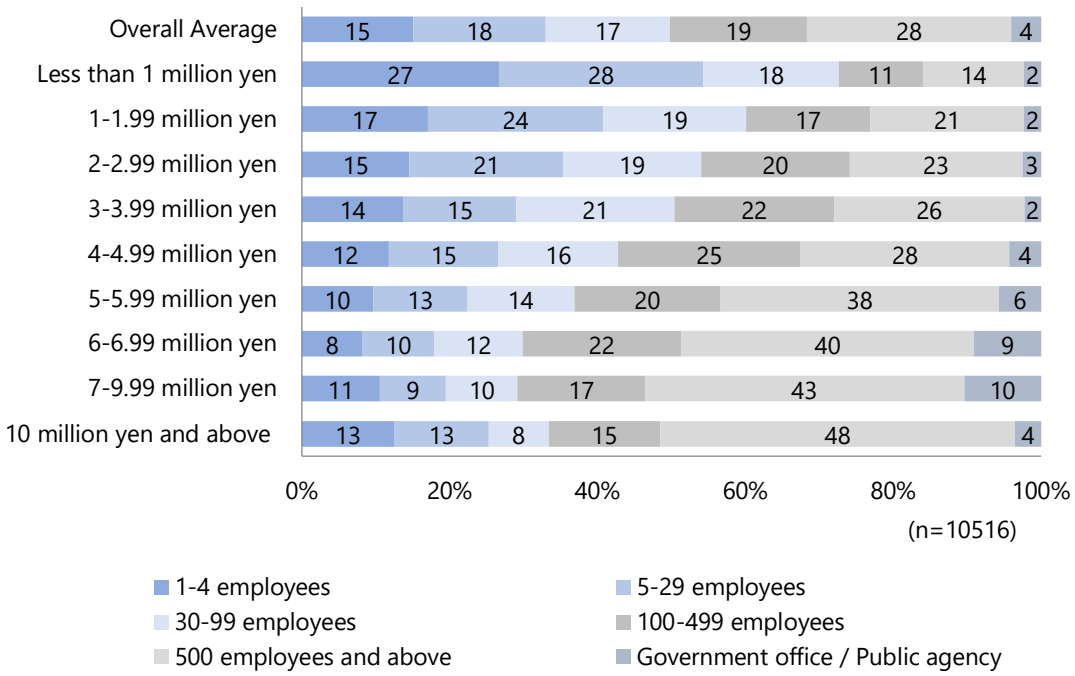


Figure 4　Firm size by income level



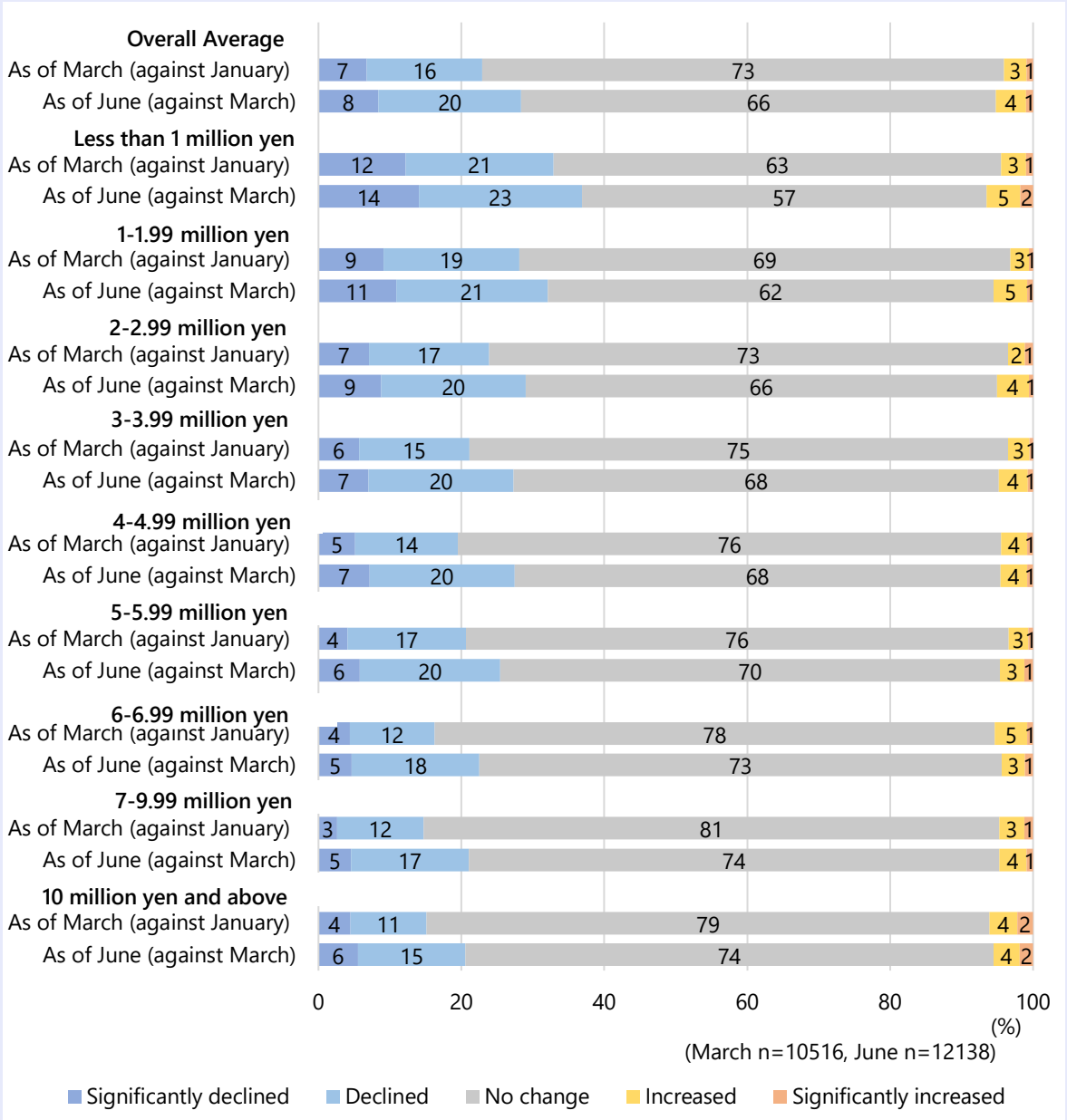
As per the figures above, there was a significant concentration and skewing in terms of industry type, occupation and firm size. There is a concentration of face-to-face service industries (restaurant and accommodation, wholesale and retail, and other services), and SMEs and micro-enterprises in the lower-income brackets, while the higher-income brackets see a concentration of large firms, information and communication industries, and managerial positions. Income gaps were particularly marked within the manufacturing industry, with, for example, production workers sitting at low income levels.

Income Decline due to the COVID-19 Pandemic

Next, we will consider the economic impact of the COVID-19 pandemic. The surveys allow us to compare changes in income from January to March 2020 with changes from March to June 2020. As Figure 5 shows, looking separately at individual income brackets, we see that the incomes of less than 30% of workers declined overall in June as against March (workers who responded that their income had "Declined significantly" or "Declined"). By contrast, slightly less than 70% of workers responded that there had been "No change" in their income, and around 5% responded that their income had increased. Comparing responses for June and for March, severe negative economic impacts were already being experienced in March, and the percentage of workers whose income had declined increased for all income brackets in June. As this indicates, the worsening trend continued and

expanded in June. The negative effects of the COVID-19 pandemic tend to concentrate in particular among the lower-income brackets.

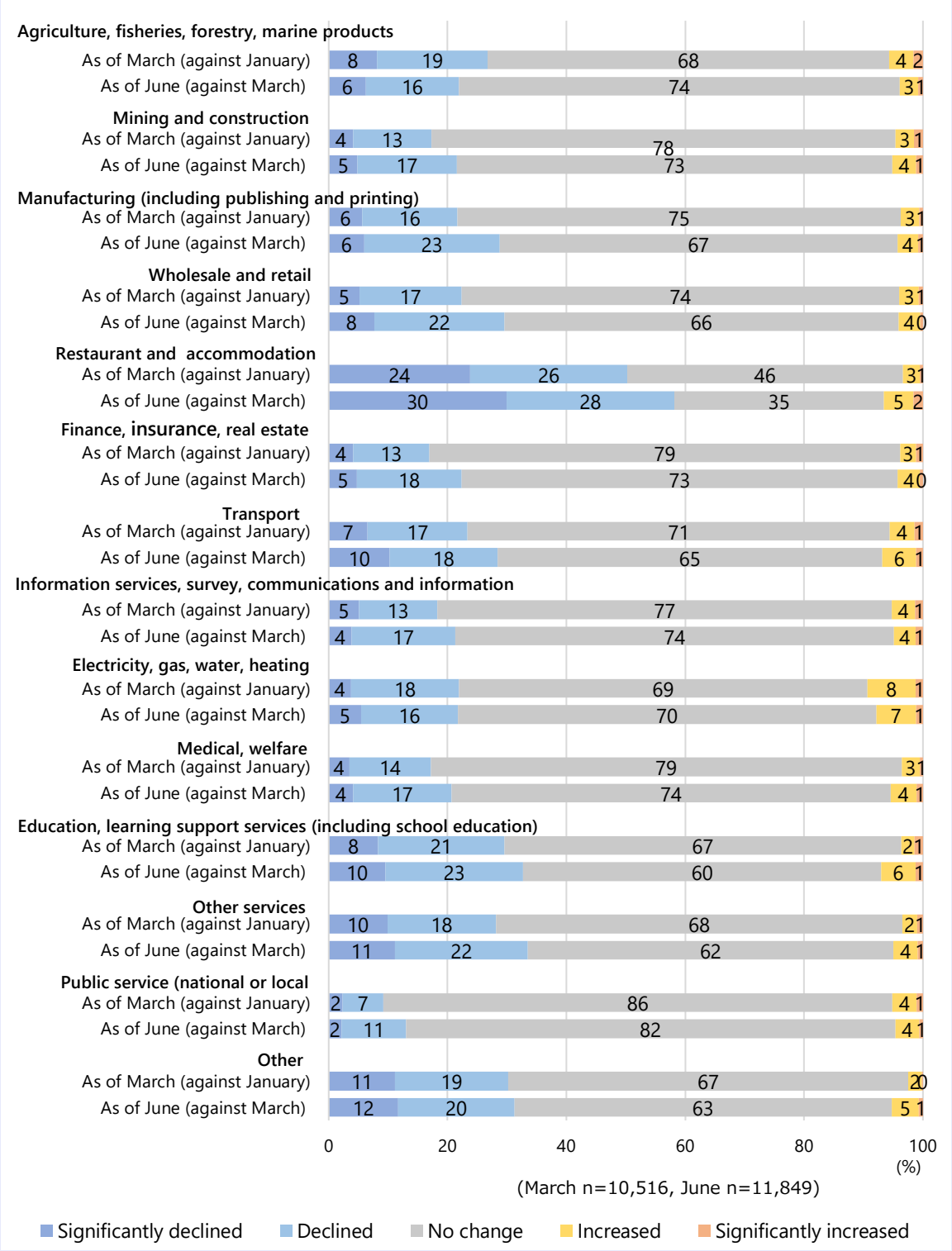
Figure 5 Changes in income by income bracket



Furthermore, considering the negative impact of the pandemic by industry, as shown in Figure 6, the impact is concentrated in certain industries. In June, 30% of workers in the restaurant and accommodation industries responded that their incomes had "Significantly declined" and 28% responded that their incomes had "Declined," making a total of 58%. This figure is extremely high compared to other industries. The next greatest negative impact is seen in the education and learning support industries (including school education) and other service industries. Given that these industries involve face-to-face contact, measures to

prevent infection have a considerable impact. In the restaurant and accommodation industries in particular, it can be assumed that the negative impact was already conspicuous among small-scale owner-run operations as early as March.

Figure 6 Changes in income by industry



Figures 7 and 8 show changes in income (by income bracket) separately for the manufacturing industry and for face-to-face service industries. In the manufacturing industry (Figure 7), comparing June to March, there is no significant difference among the different income brackets with regard to income. 26-34% of workers in all income brackets up to 10 million yen per year reported that their income had declined. It seems that for the manufacturing industry, the decline in income due to the COVID-19 pandemic is not particularly highly correlated with the income bracket. Therefore, for the manufacturing industry, we cannot say that the lower the income bracket, the higher the proportion of individuals whose income has declined.

By contrast, in the face-to-face service industries[4] (Figure 8) the proportion of workers whose income had declined increased the lower the income bracket. Looking at results as of June for income brackets up to an annual income of six million yen, we find that while 33% in the 5 to 5.99 million yen bracket and 32% in the 4 to 4.99 million yen bracket indicated that their wages had declined, the figure exceeded 40% in the 2.99 million yen and below income bracket. In the six million yen and above category, the figure was less than 25%.

Based on these results, while specific percentages of workers in each income bracket in manufacturing are experiencing a decline in wages, lower-income employees in the face-to-face service industries are seeing a greater decline, and it can be predicted that this income gap will further expand.

[4] Here, "face-to-face service industries" indicates restaurant, accommodation, education and learning support, transport, and other service industries.

Figure 7　Changes in income in the manufacturing industry by income bracket

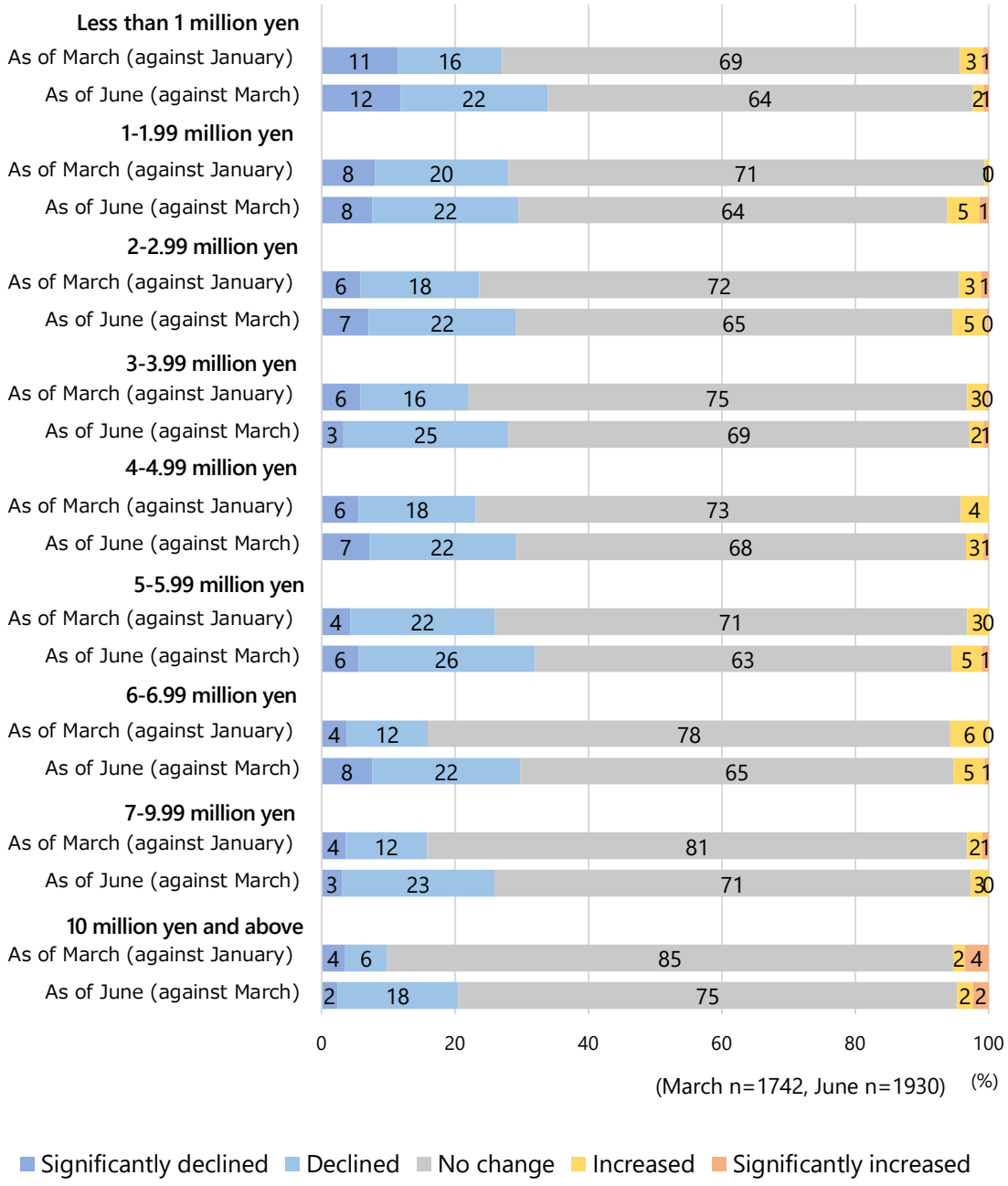
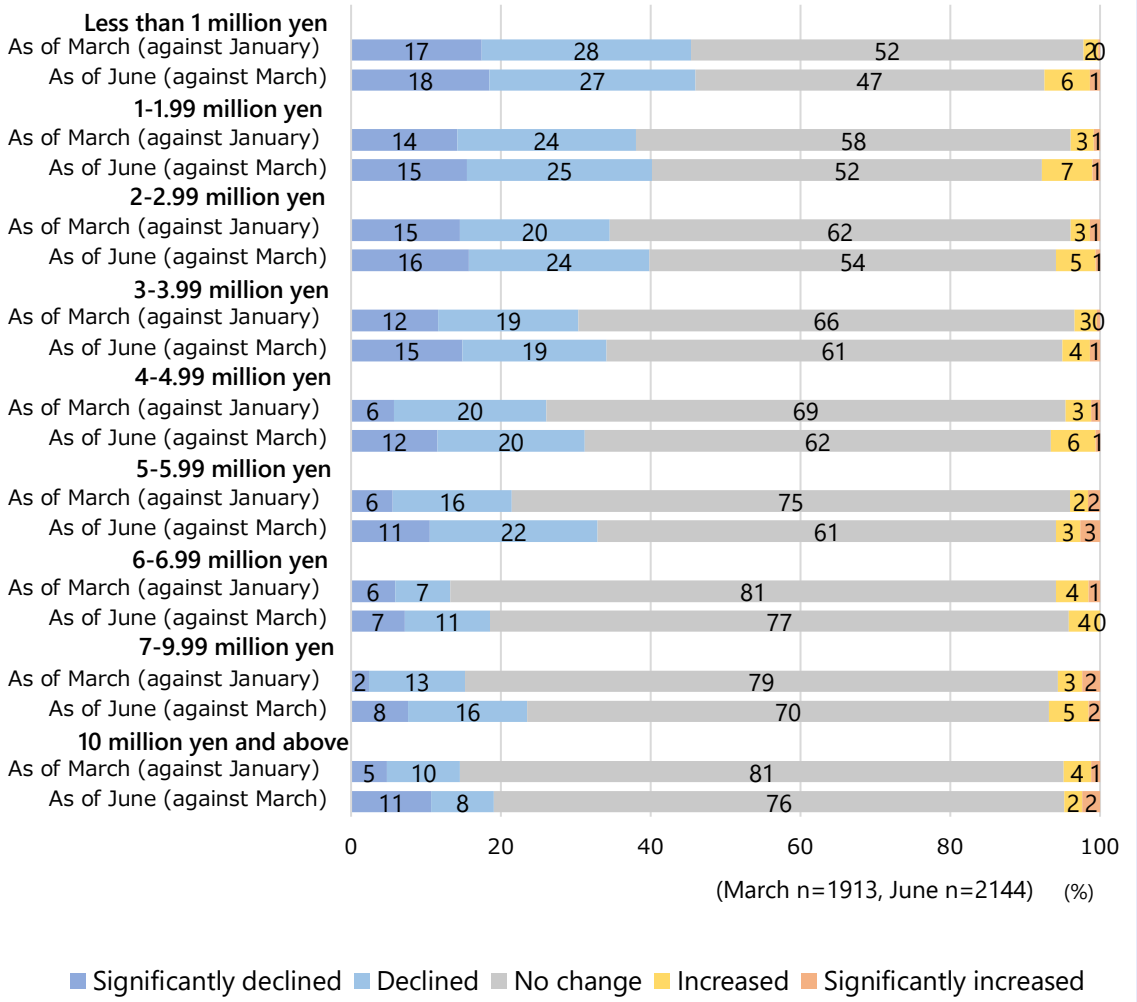


Figure 8 Changes in income in face-to-face service industries by income bracket



The Digitalization Gap during the COVID-19 Pandemic

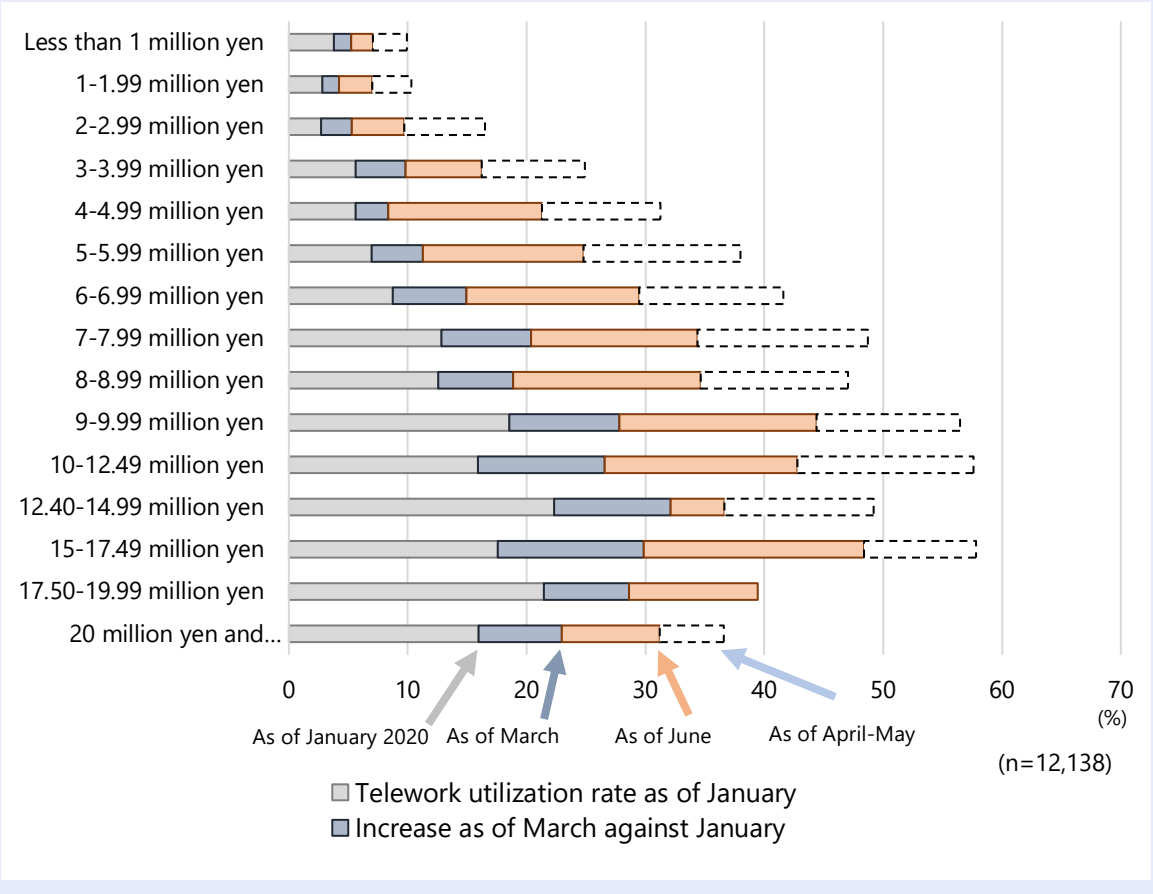
The COVID-19 pandemic has had a negative impact on face-to-face services, and income disparities have expanded. However, the effect of the current pandemic is not limited to spurring the typical economic slump that we have witnessed before. In this case, telework has been promoted as a measure to prevent the spread of the virus, and as a result, a wave of digitalization is crashing upon workers.

Given this, we will now change our perspective and focus on the “digitalization gap”. Figure 9 shows changes over time in the rate of use of telework by income bracket. Already as of January a significant difference appeared in the rate of use of telework between income brackets. The rate of use of telework increases as income rises to around 10 million yen per year. Looking at the rate of utilization of telework from March onwards, the rate increased even further with income through April and May. Even in June, when the state of emergency

was lifted, the rate of utilization of telework remained high at 30-40% for an income bracket above a certain level (7 million yen per year and above). By contrast, there was little growth in the telework utilization rate for lower income brackets.[5]

A number of background factors can be considered here, including 1) Some occupations (e.g. manual labor) and industries (e.g. face-to-face services) are unsuited to telework because face-to-face services and manufacturing procedures can only be performed at the actual place of work; 2) Many lower-income workers are employed by SMEs that do not possess the wherewithal to prepare a telework environment. Thus, the income gap and the digitalization gap are linked.

Figure 9 Changes in rate of utilization of telework by income bracket



Under such circumstances, there will be limits to the penetration of telework even if the government attempts to promote its uniform spread as a measure to prevent the spread of COVID-19[6]. This is because suitability for telework differs across industries. While there are firms that can maintain their operations through telework, face-to-face service industries,

[5] For details, see Okubo, Toshihiro (2020), "Spread of COVID-19 and Telework: Evidence from Japan," Covid Economics (2020.6. 26). *https://cepr. org/content/covid-economics-vetted-and-real-time-papers-0*
[6] For details, see Okubo, Toshihiro (2020), "Telework as a Long-term Solution: Problems and Contradictions to Overcome", NIRA Opinion Paper NO. 47.

which are unsuited to telework, are at the center of measures to prevent the spread of COVID-19. Employees of face-to-face service industries are unable to work, and their incomes decline. Alternatively, working increases their risk of infection. In this way, the income gap and the digitalization gap work in tandem to further increase economic disparities.

There appear to also be disparities across workers who utilize telework. From this point, our focus will be on teleworkers only. Our survey asked teleworkers about changes in work or lifestyle as a result of the utilization of telework. Figure 10 shows the percentage of teleworkers responding that each item had tended to increase or decrease, by firm size. Blue and orange cells indicate a relatively high percentage of teleworkers.

What is clear here is that many teleworkers working for large firms (500 employees and above) feel that there are both advantages and disadvantages to telework. Problems were experienced in doing telework, with 36% of teleworkers for large firms feeling that communication with their colleagues was diminished, and 30% feeling that their access to consultation and advice regarding their job had been reduced; at the same time, high percentages of the teleworkers responded that they were more relaxed when working (23%), that they could adjust their working times more easily (17%), and that their communication with their family had been enhanced (25%). In the future, if large firms are able to create environments for telework, the utilization of telework by their employees will enable them to reap even further benefits. However, in the case of small and medium-sized enterprises, there was no change in work or lifestyle due to the utilization of telework, and teleworkers did not enjoy the benefits of teleworking. This demonstrates that many SMEs are not able to utilize telework effectively.

Figure 10　Changes in work and lifestyle due to telework

（Unit: %）

Company size		1-4 employees	5-29 employees	30-99 employees	100-499 employees	500 employees and above	Government office / Public agency
New plans or preparations for future work duties or business	Decrease	11	10	14	14	16	17
	Increase	5	9	10	10	10	10
Ease of daily work (routine work such as office work, contacting clients, etc., creating reports)	Decrease	10	13	18	17	20	17
	Increase	3	6	6	8	10	7
Coming up with new or creative ideas	Decrease	9	11	16	14	15	14
	Increase	6	7	6	7	8	7
Ease of communication with colleagues and people outside the company	Decrease	17	23	27	27	36	31
	Increase	2	4	5	4	4	3
Giving or receiving work-related advice, consultation, guidance	Decrease	11	17	22	22	30	27
	Increase	3	4	5	6	5	5
Sense of cohesion or unity as a company / organization	Decrease	12	17	23	21	28	24
	Increase	3	4	5	5	4	4
Self-improvement, professional development, improvement of skills, for example study to acquire a qualification	Decrease	10	11	16	14	16	13
	Increase	5	7	8	8	10	10
Results-based evaluation	Decrease	11	12	17	15	16	13
	Increase	2	3	4	4	5	3
Working in a relaxed environment	Decrease	12	15	18	18	18	14
	Increase	8	11	14	17	23	17
Ease of management and adjustment of working hours	Decrease	11	13	18	17	18	16
	Increase	7	10	11	12	17	9
Time when you are not doing anything in particular while working	Decrease	9	12	16	14	14	12
	Increase	13	13	13	15	19	16
Feeling of loneliness or alienation at work	Decrease	8	10	13	12	10	10
	Increase	8	8	11	13	15	10
Health management / Mental health	Decrease	10	12	15	14	15	10
	Increase	7	9	10	11	13	11
Communication with family	Decrease	8	9	12	11	10	8
	Increase	14	18	18	18	25	17
Hobbies, social activities, volunteer activities	Decrease	16	16	18	16	17	13
	Increase	5	7	8	8	10	6

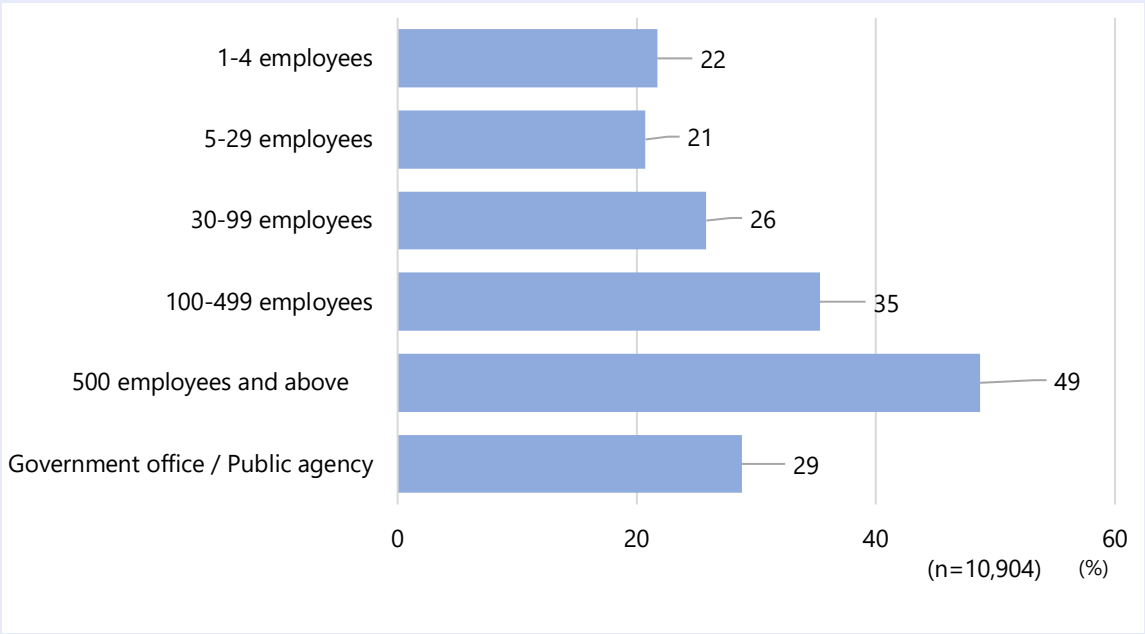
(Note) The figures above show the percentage of survey respondents indicating that the items in the left column had decreased (or increased), by company size.

The utilization of telework is only the prelude to full-scale digitalization. Here, we will consider the digitalization of firms. Our survey also asked about the status of introduction of information and communication technology (ICT) tools at workers' places of employment. Specifically, questions concerned the introduction of videoconferencing, communication tools, data sharing software, attendance management tools, ICT tools for office procedures,

accounting, human resources, and sales operations, and systems such as robotic process automation (RPA) and virtual offices. Figure 11 shows the status of introduction of these tools and systems by the size of the firm. While 49% of large firms have introduced at least some tools, the figure is limited to 20-30% in the case of small firms with 99 employees or less. This is only around half the percentage for large firms. We can see that there were disparities between different firm sizes with regard to the introduction of digital tools even before the COVID-19 pandemic.

The current pandemic might spur rapid digitalization across the board (not restricted to the utilization of telework), in particular in large firms. Firms that are not able to introduce digital technologies might suffer declining profits and an increased risk of bankruptcy. It is possible that the digitalization gap will further expand between firms that are able to respond to digitalization and those that are not.

Figure 11 Introduction of ICT tools by firm size



(Note) Percentage of workers who indicated that their firm had introduced at least one ICT tool of the type indicated in the questionnaire.

Labor Adjustment in the wake of New Technologies and the COVID-19 Pandemic

The phenomenon that labor is replaced by the appearance of new technologies and people lose their jobs is often observed at historical turning points. For example, coachmen were replaced by the advent of the automobile, and telephone operators were replaced by the automation of telephones. Additionally, the widespread use of word processors did away with typist positions, and more recently, the automation of ticket gates at train stations did away

with ticket-punching staff. Checkouts at supermarkets and convenience stores are becoming automated, and it is likely that there will eventually be no more cashiers.

Looking back at history, there is nothing new in job loss as a result of the advent of new technologies. Up to the present, this effect was limited to only certain occupations, and substitution proceeded gradually and the duties of staff members were adjusted accordingly. However, it is predicted that with the progress of digitalization, the effect will be more widespread, and many occupations will disappear.

Professors Carl Benedikt Frey and Michael Osborne of Oxford University have listed the occupations that will disappear as a result of the spread of AI in the future. This list features occupations such as taxi driver and cashier as representative occupations with a high possibility of being eliminated. The evolution of AI will see it spread rapidly through society as a whole, and this will have an enormous impact. However, because it is not possible for workers to make a smooth transition to new industries, time will be required for labor adjustment.

Response to COVID-19

The COVID-19 pandemic has come as an additional factor to the economic recession produced by the wave of technological innovation due to the evolution of AI, and will no doubt result in dramatic changes and a widening of disparities. It is necessary for us to bear in mind that the effect of the COVID-19 pandemic is not a typical economic recession.

Looking at the labor side, the labor supply is actually declining as a result of businesses and workers refraining from economic activities due to the pandemic. At the same time, demand for labor is in a downturn, in particular in the face-to-face service industries. Factors such as changes in income and employment differ significantly depending on differences in industry, occupation, and firm size. In addition to this, the development of a digital economy centering on telework and AI will cause jobs to disappear or employment to be severely restricted (in particular in the case of routine work, as indicated above) and labor will be replaced by AI and other digital technologies. The rapid advancement of this process as a result of the pandemic can be expected to cause severe social problems in the future, including large-scale unemployment, in particular among the lower-income brackets, and a widening of income disparities.

By contrast, looking at the production side, large firms that have actively invested in and responded effectively to digitalization will steadily increase their productivity even in the face of the pandemic. Such firms will no doubt reap considerable benefits from globalization, given that their utilization of digital technologies will enable them to advance their internationalization, for example in making use of overseas human resources, thus expanding their profits. This can be expected to further widen disparities between large firms and micro-enterprises unable to ride the wave of digitalization.

What became clear from our survey is that the COVID-19 pandemic creates a negative

cycle of income disparity and digital disparity. With this in mind, the policies that we should discuss in the future will be considered here from the short-term, medium-term, and long-term perspectives below.

In the short term, it will be important to provide generous subsidies to industries and occupations that have experienced a significant decline in income due to the pandemic. In the midst of widening income disparities as a result of globalization, a wave of technological innovation driven by COVID-19 has arrived, tending to further widen disparities due to the digital economy. Income gaps could result in disparities in health and children's education, leading to the collapse of society as a whole. Given this, the correction of economic disparities is an urgent task, and it will be important to provide income support, in addition to support for digitalization, to specific industries, small enterprises, and workers in lower-income brackets.

Eliminating the COVID-19 virus will be important from the medium-term perspective. Subsidies are not inexhaustible. Additionally, it will not be possible to eliminate COVID-19 without implementing strong regulations such as urging businesses to restrain or suspend their activities. For this reason, in order to enable adaptation to "life with COVID-19," it will be necessary to increase the durability and flexibility of the labor market and maintain employment by promoting policies that increase the speed of labor adjustment and encouraging workers to take second jobs.

In the long-term, the issues will be how to promote economic revival and the "AI-ization" and digitalization of the economy, and how to correct economic disparities. Today, as disparities expand, there are serious problems in relation to supplying public funds by means of a highly regressive consumption tax increase. Rather, the government should emphasize the introduction of a universal basic income that would provide citizens with the minimum income necessary for their lives, in addition to the reduction of the consumption tax, in order to reduce economic disparities. Alternatively, another potential scheme would be the introduction of robot or AI taxes in order to supply public funds.

In the future we will face extremely serious issues: How to control government debt following large-scale expenditures of public funds, whether to respond to budget deficits by increasing taxes, and whether to aim for economic growth by accelerating the introduction of the digital economy.

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