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Japan's Economy: Monthly Outlook (Apr 2021)

Third state of emergency due to mutant strains brings increasing risk of economic downturn

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Summary

- While world trade volume hit a historic high during the month of January 2021, the number of international tourists fell by nearly 90% in comparison to the previous year. In Japan's domestic economy, consumption has been held down centering on services associated with risk of COVID-19 infection. As a result of the spread of infection concentrating in the tourism, eating & drinking, and entertainment industries, the disparity between industries in terms of economic activity has grown as large as it did after the global financial crisis of 2008. On the other hand, neither corporations in the manufacturing industry nor the non-manufacturing industry have suffered major declines in anticipated growth rate. One of the factors behind this fact may be that, unlike the global financial crisis of 2008, adjustment of capital stock and labor input was completed in a relatively short period of time.
- The Special Stricter Measures implemented in ten prefectures are estimated to bring downward pressure on real GDP of around 0.4 tril yen per month. Osaka Prefecture moving toward requesting the national government to declare another state of emergency, and the Tokyo Metropolitan Area is seriously considering doing the same. If an explosion in infections occurs in a large number of regions due to the spread of highly infectious mutant strains of COVID-19, severe measures along the same lines as the state of emergency declared in the spring of 2020 will become unavoidable, in which case the economy in the Apr-Jun period is expected to deteriorate significantly. The spread of mutant strains continues to require close attention, and progress in vaccination has become all the more important.
- As for the outlook for the economy in the near future, it will be important to keep in mind the effects of the shortage in semiconductors on holding down domestic automobile production. If domestic automobile production declines by 500,000 units due to the shortage in semiconductors, the direct effect on real GDP will be around -0.2 tril yen. If we include the short-term effects on related industries, this comes to around -0.5 tril yen. If the effects are long-term, negative effects could spread to a wide range of industries via the supply chain, bringing downward pressure on real GDP to around -0.9 tril yen.

1. Japanese Economy Polarized by Coronavirus Crisis

It has now been one year since a nationwide state of emergency was first declared. Lockdown orders were also implemented in major cities in the US and Europe at that time, bringing a decline in Japan's real GDP growth of -29.3% q/q annualized during the Apr-Jun period of 2020. It was one of the steepest declines experienced in Japan's GDP during the entire postwar period. After the state of emergency was completely lifted in June that year, restart of the economy progressed, and the economy recovered rapidly, having avoided rapid growth in bankruptcies and unemployment through large-scale fiscal and monetary policy. However, as we moved into November last year, the spread of COVID-19 again became serious, and a second state of emergency was declared in January 2021. Meanwhile, lockdowns in countries such as Israel and the UK had been effective, and vaccination efforts were progressing rapidly, leading to declines in the number of new infections. But in comparison, infections began spreading again in Japan with the effects of highly infectious mutant strains, and now the declaration of a state of emergency for the third time is closer to becoming a reality.

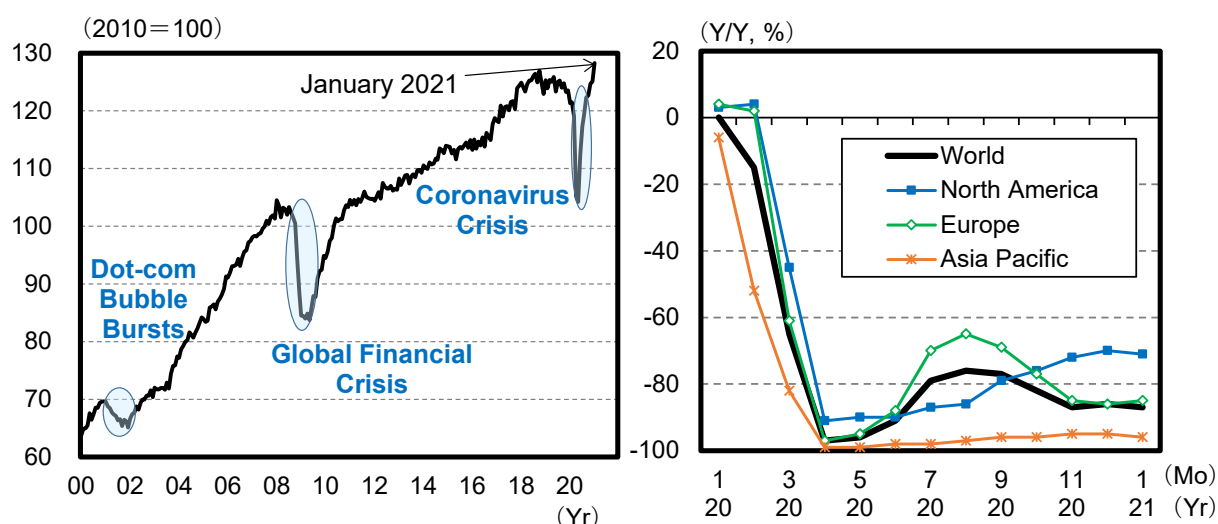
With circumstance as they are, Japan's economic recovery is now polarized. Economic activity is now favorable in the manufacturing industry, but the service industry remains sluggish since it is more susceptible to the effects of the spread of infection. In this report, we will first summarize the latest situation of the Japanese economy from supply-side statistics and a survey of corporations. Next, we examine the magnitude of adverse effects on the economy of the Special Stricter Measures applied in ten prefectures, as well as providing an economic outlook for the future and discussing the risk of cuts in automobile production due to the semiconductor shortage.

The global movement of goods has normalized, but human activity remains stagnant

Looking at global trade volume and the number of international tourists (inbound consumption), we can see that over time, polarization has occurred between the global movement of goods and the movement of people (Chart 1). When the coronavirus crisis first hit, world trade volume fell about the level it was at after the global financial crisis (September 2008 and onward), but then completed its adjustment phase within a fairly short time, hitting a historic high in January of 2021. Behind this lies the fact that corporations were able to avoid a major deterioration of financial position as well as employment and income environments with the support of fiscal and monetary policy. Moreover, household consumer demand shifted from services to goods, due to limitations on travel and eating out, while the increase in telework brought an increase in demand for information related goods. Meanwhile, online transactions increased.

World Trade Volume (Left) and International Tourism (Inbound Consumption, Right)

Chart 1



Source: Netherlands Bureau for Economic Policy Analysis, UNWTO; compiled by DIR.
Note: Figures in chart at left are seasonally adjusted.

The number of international tourists remains stagnant. According to the United Nations World Tourism Organization (UNWTO), the number of international tourists worldwide fell from 1.46 billion in 2019 to under 400 million in 2020 or -74% y/y. The rate of decline experienced in 2009 right after the global financial crisis of 2008 was only -4%. Looking back at monthly statistics after COVID-19 began to spread, we see that there was an especially dramatic decline in the number of international tourists worldwide in April 2020 at -97%. After that point, centering in Europe, the numbers made a comeback by summer. But then after that, the rate of decline again increased as the pandemic situation worsened again. In North America, the rate of decline gradually decreased starting in September last year, while other areas remained unchanged, and international tourism fell again by -87% in January 2021.

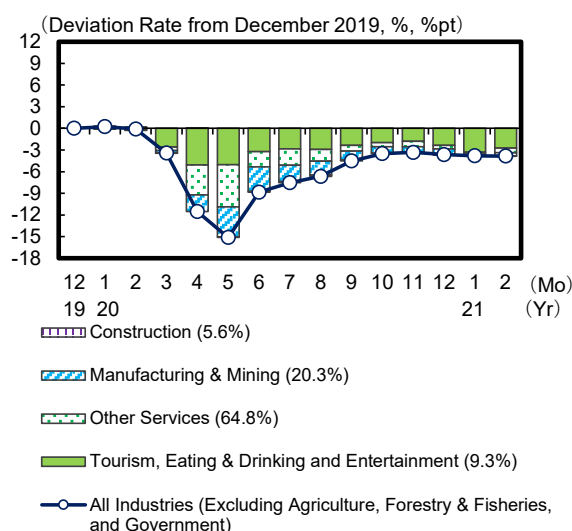
Disparity in economic activity between industries rises to level seen after global financial crisis of 2008

Changes in global movements of goods and people are strongly reflected in Japan's exports. Exports of goods in the Oct-Dec period of 2020 recovered to almost the same level as the previous year, while exports of services, including inbound consumption, fell below the previous year's level by nearly 30% (real amount on a GDP basis). In addition, consumption has been curtailed in Japan, mainly for services which bring risk of infection. Consumer turn-out at retail outlets and entertainment facilities according to Google was nearly 10% below the level seen before COVID-19 began to spread as of the end of March 2021 (median level by day of week between January 3 and February 6, 2020).

Chart 2 shows a factor analysis of the activity index for all industries (excluding agriculture, forestry & fisheries, and the public sector). The deviation rate since December 2019 is shown in the monthly line graph, which was at around -4% in February 2021. Most of the downturn was contributed by the tourism, food and entertainment industries, which accounted for just under 10% of value-added production value as of 2015. The impact of the spread of COVID-19 is concentrated in these industries.

Changes in Activity Index for All Industries

Chart 2

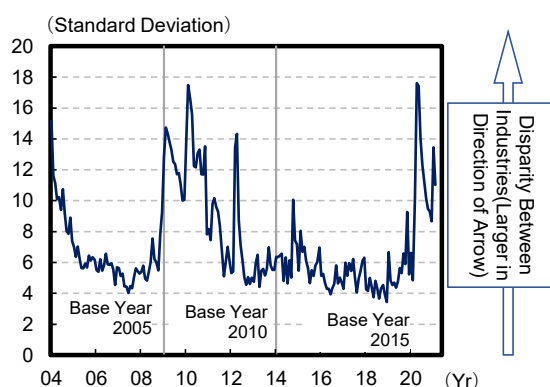


Source: Ministry of Economy, Trade and Industry, Ministry of Land, Infrastructure, Transport and Tourism, Ministry of Internal Affairs and Communications; compiled by DIR.

- Notes: 1) Tourism, food and entertainment industries include accommodations, eating & drinking services, tourist transport, and living related services.
2) Figures appearing in parenthesis denote the weight of that industry's value-added production value according to the input-output table for the year 2015.

Disparity in Activity Index Between Industries

Chart 3



Source: Ministry of Economy, Trade and Industry, Ministry of Land, Infrastructure, Transport and Tourism; compiled by DIR.

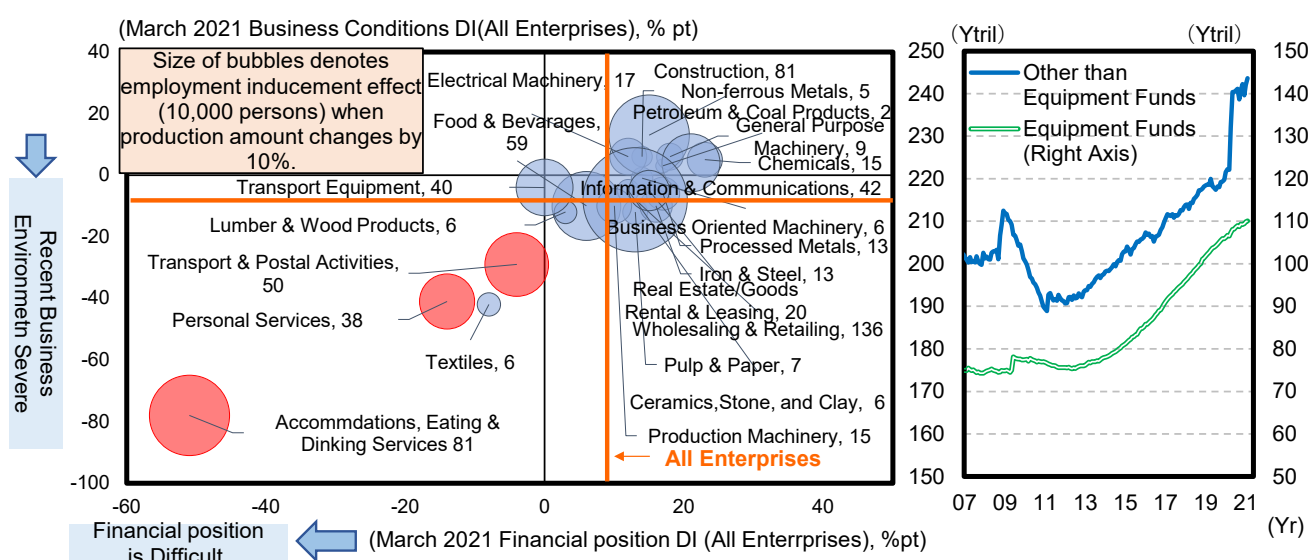
- Notes: 1) Standard deviation in y/y terms for economic activity index performance for each industry.
2) Industries covered are manufacturing (14 industries), mining, and construction, as well as 48 tertiary industries with base year 2005, 49 with base year 2010, and 51 industries with base year 2015. Categories are adjusted so as to come as close to middle classification of year 2015 as possible.

In Chart 3, the industries listed in Chart 2 are subdivided into just under 70 industrial categories, and then their standard deviations from the same month of the previous year are shown in a time series. The greater the standard deviation, the greater also the disparity in comparison to other industries in terms of economic activity. Taking a look at changes since 2004, we see that the standard deviation rose around the year 2004 and then again after the global financial crisis of 2008. And now it has risen again during the current crisis. Around the year 2004, as the economy recovered, the economic activity index rose sharply in industries such as services associated with the internet, electronic parts and devices. Behind this was the widening disparity in growth potential between industries. The impact of the global financial crisis of 2008 centered on the manufacturing industries, while effects on the non-manufacturing industries were limited. The current economic crisis is completely different in character from the global financial crisis of 2008, and yet the disparity between industries in economic activity has grown to the same extent as at that time.

Industries strongly affected by the spread of COVID-19 continue to need generous financial support measures

The left side of Chart 4 shows disparities between industries in recent business environment and financial position, using data compiled from the BOJ Tankan March survey (all enterprises) released on April 1, 2021. Business environment is located on the vertical axis, and financial position on the horizontal axis. The further an industry's position on the chart moves to the lower left, the more severe its business environment, while the further the position is to the right, the better its financial position (the left side being more stringent). Business conditions DI ("favorable" – "unfavorable") improved in March for non-ferrous metals, electrical machinery, general-purpose machinery, and motor vehicles as part of the transport equipment industry, having reaped the benefits of favorable exports and the comeback for domestic and overseas capital expenditure. Meanwhile, construction and information communications (excluding other information and communications) also managed to maintain a positive business conditions DI even after the spread of COVID-19 began, backed by the increase in public investment and growth in the volume of data transmission.

Business Environment & Financial position by Industry (Left) and Changes in Corporate Loans by Use (Right)
Chart 4



Source: Bank of Japan, Ministry of Finance, Ministry of Internal Affairs and Communications; compiled by DIR.

Notes: 1) Industries whose bubbles are colored in red suffered losses during the Oct-Dec period of 2020.

2) Personal services on the BOJ Tankan include living related services and entertainment as appear in corporate statistics.

3) The employment inducement effect is from the input-output table for the year 2015.

On the left side of Chart 4, we find accommodations, eating & drinking services, personal services, transport & postal activities, and textiles positioned at lower left. According to the Financial Statements Statistics of Corporations by Industry (Ministry of Finance), these industries (with the exception of

textiles) reported ordinary losses during the Oct-Dec period of 2020. The BOJ March Tankan survey was carried out between February 25 and March 31 in the Tokyo area and certain other regions when the state of emergency was in effect. Hence, it was difficult capturing data on accommodations, eating & drinking services, personal services, and the tourist related aspect of transport & postal activities. Meanwhile, the textiles industry suffered from the effects of the decline in demand for business dress and fashionable clothing accompanying the shift to working at home and the decline in frequency of going out. In these industries, not only medium-sized and small enterprises, but large enterprises also experienced major declines in financial position DI (“easy” – “tight”). Although the government and the Bank of Japan are implementing generous cash flow support measures (Chart 4, right), the situation remains severe regardless of the size of the company.

The size of the bubbles on the left side of Chart 4 represents the employment inducement effect. The numbers next to the industry names in the chart indicate the extent of change in the number of employees when the amount of production changes by 10%. The employment inducement effect is the change in demand for labor associated with growth and decline in production expressed in terms of the long-term influence of adjustments in the number of employees. According to the 2015 input-output table, the employment inducement effect of the accommodations and eating & drinking services industry was next to wholesaling & retailing in size, with the number of employees changing by 810,000 with a 10% change in the amount of production. Transport & postal activities at 500,000 persons, and personal services at 380,000 persons also had fairly significant employment inducement effects coming close to the transport equipment industry at 400,000 persons.

The fact is that industries which have stagnated due to the coronavirus crisis have also experienced a major downturn in demand for labor. Even so, the unemployment rate was only 3.1% at its peak after COVID-19 began to spread. This was greatly influenced by the employment adjustment subsidy. According to the Cabinet Office report, "Japan's Economy 2012-2013", it is estimated that employment payments implemented after the global financial crisis of 2008 kept the unemployment rate down from April to December in 2009 by 0.4-0.8%pt. Calculating the unemployment rate suppression effect during the coronavirus crisis with reference to this method, it appears that unemployment was reduced by 2.0-2.4%pt from April to December 2020¹. Employment maintenance measures such as this and cash flow support measures will likely be greatly needed until the spread of infection is brought under control.

Anticipated growth rate for corporations has not declined since spread of COVID-19 began in either manufacturing or non-manufacturing

After the global financial crisis of 2008, large-scale adjustment of capital stock and regular employment continued over the course of several years, bringing with it a decline in the potential growth rate, which represents mid to long-term growth of the economy. However, as of this point in time, we believe that the type of situation experienced in the past can be avoided. As Keiji Kanda et al. noted in the DIR report dated 21 January 2021, “[Japan's Medium-term Economic Outlook](#)”, the main factors of production in the economy, capital stock and labor input, have both completed adjustment in a short period of time, and are now in a recovery phase. Infrastructure for remote socio-economic activities was rapidly developed by the public and private sectors in the wake of the spread of COVID-19. The establishment of the Digital Agency is scheduled for September 2021, and the potential growth rate has an excellent chance of increasing through the acceleration of digitalization.

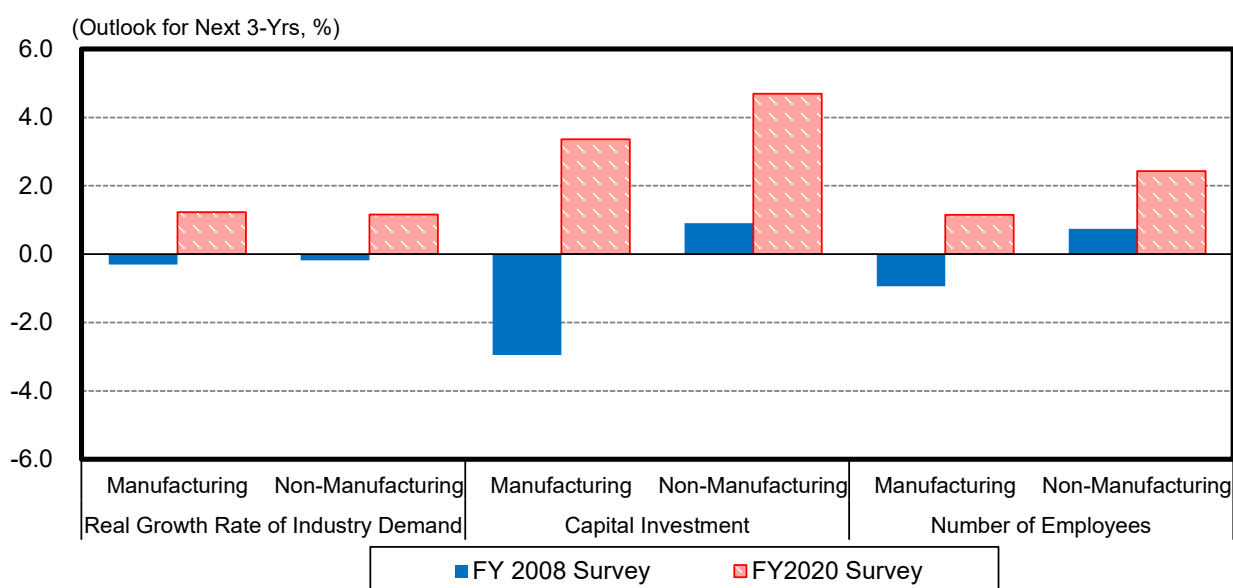
Furthermore, taking a look at the Cabinet Office “Annual Survey on Corporate Behavior” (listed companies) published in March 2021, we see that anticipated growth rate, which is an important factor in making decisions about capital investment and employment plans, has not declined since the spread of COVID-19 began (Chart 5). The outlook for the next three years of real growth rate of industry

¹ For more detail on the estimation method see the DIR report by Keiji Kanda and Akane Yamaguchi, Munehisa Tamura, and Megumi Wada dated 1 April 2021, [Japan's Economy: Monthly Outlook \(Mar 2021\)](#).

demand according to the FY2020 survey is positive for both the manufacturing and non-manufacturing industries, and exceeds the outlook on the FY2019 survey². The accommodations, eating & drinking services, personal services, and transport & postal activities industries, which were shown to be in a severe business environment on the left side of Chart 4, also have a positive outlook³.

The outlook for the next three years of capital investment and number of employees is also positive for both the manufacturing and the non-manufacturing industries. This differs greatly from the results of the FY2008 survey carried out after the global financial crisis. At the time, the outlook for industry demand was negative for both industries, and the impact on business environment was especially severe for manufacturing, which showed a negative outlook for capital investment and number of employees (Chart 5).

Midterm Corporate Outlook for Industry Demand, Capital Expenditure, and Number of Employees (Listed Companies) **Chart 5**



Source: Cabinet Office; compiled by DIR.

Note: Surveys taken in January 2009 and January 2021. Outlook for the next three years is a fiscal year average.

One of the factors behind the short-term completion of adjustment of capital stock and labor input may be the fact that corporations are not pessimistic about the future of the economy in the midterm. Even so, Japan is still under threat of the spreading of COVID-19 infections. With the disparity between industries in economic activity increasing, the anticipated growth rate of corporations could change if the spread of COVID-19 continues for longer than expected. In order to ensure a full-scale recovery of the post-corona economy, it is necessary to accelerate the pace of vaccination while supporting the business activities of corporations through fiscal and monetary policies.

² The survey is carried out in January of each fiscal year.

³ For this section we referred to the Survey on Corporate Behavior, covering the services industry, land transport, and the warehousing and transport related industry (marine and air transport are not covered since only two companies answered the questionnaire).

2. Third State of Emergency Now in Sight Due to Spread of Mutant Strains

Special Stricter Measures in ten prefectures will push real GDP down by around 0.4 tril yen per month

The second state of emergency was lifted on March 21, but the spread of infection is again becoming serious centering on major urban areas, due to growth in consumer turn-out after the state of emergency was lifted, and the spread of mutant strains of the disease. At the request of prefectural governors, the government applied "Special Stricter Measures" in Osaka, Hyogo, and Miyagi prefectures starting on April 5. After that, the target area was gradually expanded to a total of 10 prefectures: Tokyo, Kyoto, Okinawa, Saitama, Chiba, Kanagawa, and Aichi. The implementation period varies depending on the region, but it is scheduled to be about one month.

Central to this measure is the shortening of business hours of eating and drinking establishments. The new measure is not that different from the second state of emergency. However, in contrast to the state of emergency, which was applied to each individual prefecture separately and as needed, the Special Stricter Measures are applied to particular towns and cities within the prefecture by the governor. The new measure focuses on areas consisting of approximately 60% of the populations of each of the ten prefectures named, and are designated by the prefectural governors. Considering the impact of the second state of emergency on the economy, as well as the populations of the current measure's designated areas, the Special Stricter Measures are expected to push real GDP down by around 0.4 tril yen per month (Chart 6).

Summary of Special Stricter Measures, Second State of Emergency, and Effects on Japan's Economy
Chart 6

	This Time Special Stricter Measures		Beginning of 2021 State of Emergency	Spring 2020 State of Emergency
Period	April 5 – May 11, 2021 (Planned: 37-Days)		January 8 – March 21 (73-days)	April 7 – May 25 (49-days)
Regions Affected	Designated areas in 10-prefectures (population: 0.4 tril)		11-Prefectures (population: 0.7 tril)	Nationwide (population: 130 mil)
Influence on Business	Same as state of emergency at beginning of 2021.		Business hours shortened centering on restaurants and bars, with closing time by 10PM Events limited to a maximum of 5,000 persons, or a 50% decrease in attendees.	Restaurants & bars, hotels and other lodgings, and entertainment facilities requested to close temporarily or shorten hours.
Others	Suspension of Go To Campaigns continues		Temporary Suspension of Go To Campaigns	Public school attendance suspended in many districts
Effect on Real GDP	About 1-Month	Around -0.4 Tril Yen	Around -1.1 Tril Yen (Around -0.7 Tril Yen)	Around -3.1 Tril Yen
	Period Total	Around -0.4 Tril Yen	Around -2.5 Tril Yen (Around -1.5 Tril Yen)	Around -3.8 Tril Yen

Source: Ministry of Internal Affairs and Communications, Cabinet Office, Bank of Japan, News Media; compiled by DIR.

Notes: 1) Figures for local populations are as of January 1, 2020, from the Ministry of Internal Affairs and Communications "Basic Resident Register". In all cases shown in the chart, measures spread gradually, case by case in each region, and were lifted in stages.

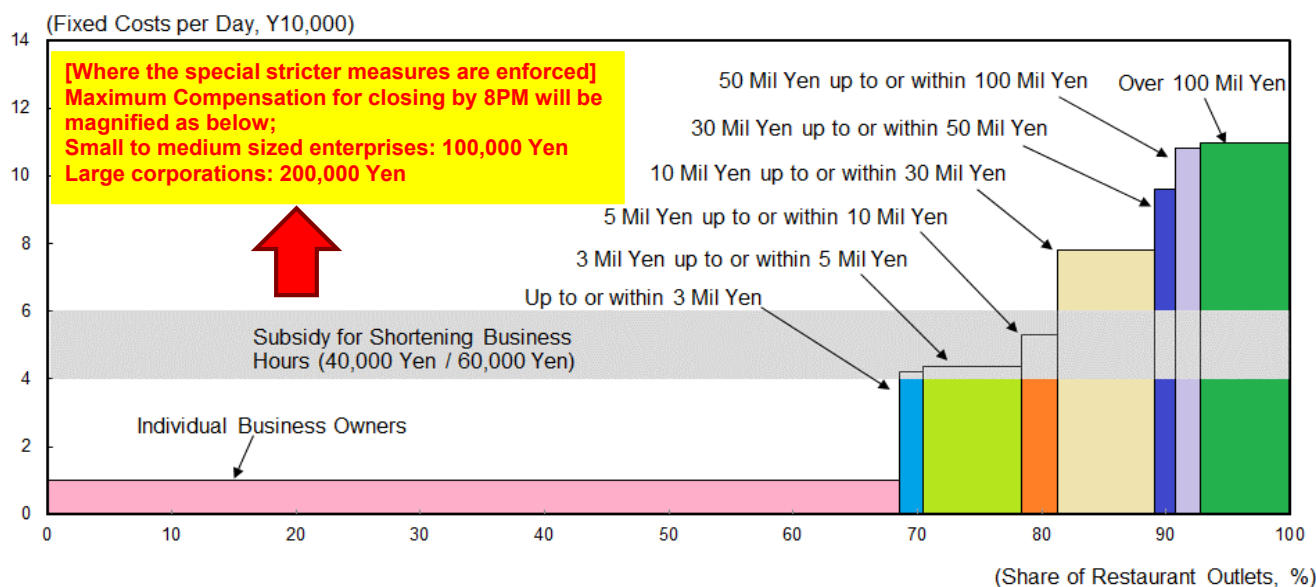
2) Figures shown in parenthesis denoting impact on real GDP of the state of emergency as of beginning of 2021 are excluding the effects of the Go To Travel Campaign.

Meanwhile, this time around the system was revised so that the subsidy for cooperation in shortening hours of operation, which was a uniform payment last time, will be tailored to the size of the company. Small to medium sized enterprises who respond to the request for shortening hours of operation (closing by 8PM) in the areas where the special stricter measures are being put into effect will be paid 40,000 to 100,000 yen per day depending on sales⁴. For outlets of large corporations, the maximum is 200,000 yen per day depending on the amount of decrease in sales. As shown in Chart 7, fixed costs for restaurants

⁴ Businesses outside the areas affected by the Special Stricter Measures will be paid 25,000 to 75,000 yen per day.

vary greatly depending on the size of the company, so with uniform payments, the larger the company, the more difficult it is to manage, and it is difficult to accept requests for shorter working hours⁵. This change is expected to alleviate the problem to some extent, and is expected to improve the effectiveness of the request to shorten hours.

Percentage Share of Restaurant Outlets by Capitalization and Fixed Costs per Day (2015) Chart 7



Source: Ministry of Internal Affairs and Communications; compiled by DIR.

Notes: 1) Fixed costs are the total of payment of salaries, rental fees for movable property & real estate, and interest payments etc.

2) Fixed costs of sole proprietorships in the case of businesses capitalized at up to 3 mil yen were estimated based on the ratio of fixed costs to sales of individual restaurant outlets.

Osaka and Tokyo moving towards requesting declaration of a third state of emergency

It is now becoming more and more likely that the Special Stricter Measures will be unable to suppress the spread of infection completely. In Osaka Prefecture where the spread of COVID-19 has been especially serious, though the entire region has been designated under the new measures, consumer turn-out has not declined as much as it did during the second state of emergency. For instance, in the case of the Tokyo metropolitan area, there are situations such as JR Mitaka Station where Musashino City lies on the north side of the station inside the designated area, while Mitaka City on the south side is outside the area designated by the measures. There are concerns that the crowds will simply flow to the other side of the station not designated by the measures, which have targeted the specified area in almost too much detail. Moreover, in Tokyo and other cities, the definition of shorter operating hours for restaurants and bars extended closing time until 9PM before the new measures were declared, hence the effects of the Special Stricter Measures ended up being only slight.

Here the influence of highly infectious mutant strains also come into play. Osaka Prefecture, where the number of new infections per day has been over 1,000 for several days in a row, made a formal policy decision on April 20 to request that the central government declare a state of emergency. Governor Hirofumi Yoshimura indicated that if a state of emergency is declared, he is considering requesting restaurants & bars within the prefecture, as well as department stores and theme parks to close during the period. The Tokyo Metropolitan government has also begun to seriously consider requesting the central government to declare a state of emergency as a means of strengthening measures to prevent the further spread of COVID-19. According to news reports, a monitoring meeting will be held on the 22nd

⁵ The problem of payments for cooperation in shortening business hours and opinions on the direction of policy are discussed in the DIR report dated 26 February, *Japan's Economy: Monthly Outlook (Feb 2021)*, by Keiji Kanda, Akane Yamaguchi, Yutaro Suzuki, and Taisei Watanabe.

to confirm the status of infections and the readiness of the medical care provision system, and after hearing the opinions of experts, the final decision will be made as early as the same day.

According to the DIR outlook as of March 9, the real GDP growth rate for the Jan-Mar period is seen at -5.1% q/q annualized, while the Apr-Jun period is expected to achieve growth of +4.8% (Chart 9). However, if an explosion in infections occurs in most regions of Japan due to the spread of mutant strains of COVID-19, severe measures along the lines of the state of emergency declared in the spring of 2020 will be unavoidable, and this will cause the economy to suffer a major deterioration in the Apr-Jun period.

This would mean that our main scenario for the Japanese economy will move closer to the risk scenario as described in our previous monthly report, [*Japan's Economy: Monthly Outlook \(Mar 2021\)*](#). The risk scenario assumes that highly infectious mutant strains will replace the current type of COVID-19 between now and the end of April, causing the effective reproduction number (which indicates how many people are infected by one infected person) to grow by more than 0.55⁶. The risk scenario assumes that even if Japan is successful in vaccinating around 50% of its population by end March, 2022, explosions in infections will occur three times during FY2021. Strict measures along the lines of the state of emergency declared during the spring of 2020 will likely be required. Moreover, if the rate of vaccination remains at around 25% as of the end of March 2022, the FY2021 real GDP growth rate is expected to be at -0.7% y/y. If things turn out this way, FY2021 GDP will end up being one of the worst years on record during the entire postwar period (all but the worst being FY2020 at -4.9%). Meanwhile, the number of deaths due to the spread of COVID-19 will exceed 10,000 in FY2021, and it is expected that the number of suicides due to economic hardship will increase significantly⁷. The spread of mutant strains of the disease continues to be an issue requiring close attention, and it is becoming increasingly important to expedite vaccination, which lags behind other countries.

A decline in automobile production of 500,000 units or more due to the shortage in semiconductors could have a negative effect on real GDP of up to -0.9 tril yen

As for the immediate economic outlook, close attention must be paid to the effects of the semiconductor shortage in holding down domestic automobile production. The shortage in semiconductors for use in automobiles is due to the rapid growth in demand for semiconductors for PCs and data centers, and the transition to 5G (5th generation mobile communication system), which has occurred since the COVID-19 pandemic began. The problem has been further exacerbated by a fire at the factory of a Renesas Electronics manufacturing subsidiary on March 19. The company has around 20% share of the world market for microcomputers that control automobiles, and is an important supplier for automobile manufacturers. The factory's production line was restarted on April 17, but the company announced on April 19 that it could be later than July before semiconductor shipments are expected to recover to the same level as before the fire.

Due to the effects of this situation, automobile manufacturers have been cutting production one after another. According to various reports, Nissan Motor, Mitsubishi Motors, SUBARU, and others are planning to reduce production at domestic and overseas plants, and Honda is planning to reduce production at overseas plants after April. Toyota Motor is scrutinizing the impact. At this point, it is unclear how much the production will be reduced, but the analyst in the automobile sector of Daiwa Securities is predicting that global production of Japanese finished vehicles will be reduced by about

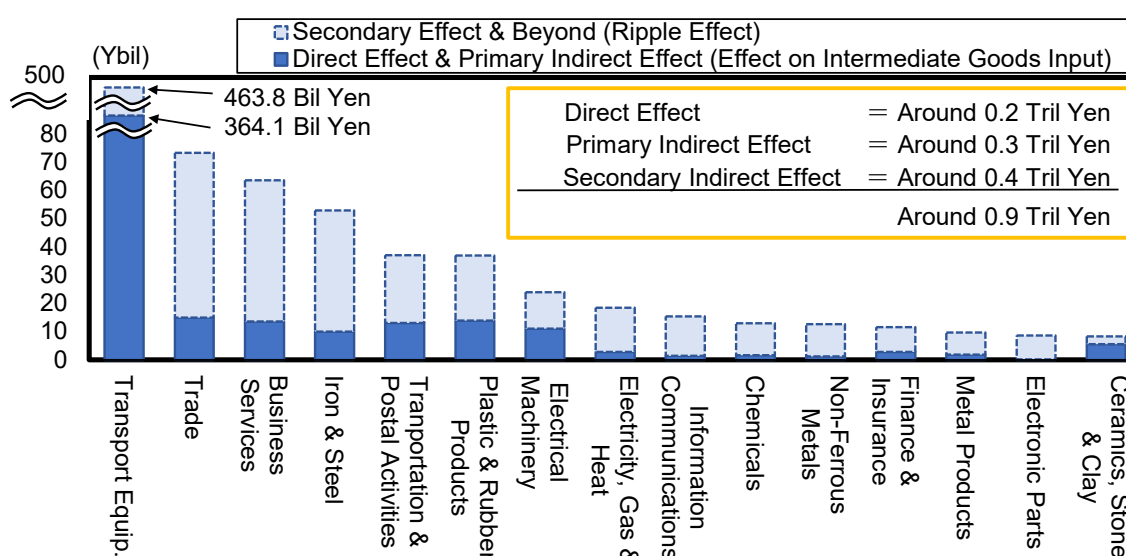
⁶According to the results of a survey conducted by the Imperial College of London published at the end of 2020, the spread of mutant strains of COVID-19 could increase the effective reproduction number by 0.4 – 0.7. According to the scenario which assumes that mutant strains of COVID-19 will begin to spread, the effective reproduction number will begin to increase from the beginning of March, and as of the end of April will have risen by 0.55.

⁷ It has been found that whenever the unemployment rate has risen by 1%pt between 1998 – 2019, there has been a correlation with growth in suicides caused by economic difficulties and daily life problems, which have grown by around 1,800. Using this as the basis of our estimate, we see suicides due to financial hardship growing by around 3,700 if highly infectious mutant strains of COVID-19 spread, and the pace of vaccination lags.

350,000 to 400,000 units centering on the Apr-Jun period⁸. In addition, semiconductor giant TSMC expects that the supply shortage of semiconductors for automobiles will be resolved in 2023.

The decline in the production of automobiles, which are a major export product and involve a broad range of related industries, could easily become a significantly negative factor for the Japanese economy. We estimated the impact on real GDP assuming that the decline in automobiles due to the shortage in semiconductors exceeds the level of 500,000 units (Chart 8). The direct effect of the decline in automobile production is found to be around -0.2 tril yen when we multiply the number of units by which production is assumed to be reduced (500,000 units) by the production value per vehicle in 2020 (2,320,000 yen per unit), and then multiply the value-added rate of passenger vehicles (17%) according to the 2015 input-output table. In addition, if we calculate the short-term effect on other industries (the primary indirect effect) using the input-output table, we arrive at influence of around -0.3 tril yen on real GDP, or a total of -0.5 tril yen when added to the above-mentioned direct effect.

Effect on Value-Added Production of Various Industries if Domestic Automobile Production Declines by 500,000 Units or More **Chart 8**



Source: Cabinet Office, Ministry of Economy, Trade and Industry, Ministry of Internal Affairs and Communications, Automobile Manufacturers; compiled by DIR.

Note: The direct effect is the number of units by which production is assumed to be reduced multiplied by the production value per vehicle in 2020, which is then multiplied by the value-added rate of passenger vehicles. The indirect effect is calculated by using the input coefficient according to the input-output table (the primary indirect effect), and the inverse matrix coefficient (secondary indirect effect and beyond), in consideration of the domestic self-sufficiency rate and the value-added rate.

If the semiconductor shortage is resolved in a short period of time, automakers will be able to recover the decline in earnings due to the direct effect and the primary indirect effect through recovery production. But if the impact is prolonged, it will have a negative effect on a wide range of industries throughout the supply chain. Combined with these economic spillover effects (about -0.4 tril yen for secondary indirect effects and beyond), the extent of the reduction in real GDP will grow to around -0.9 tril yen. This is equivalent to about -0.2% of Japan's real GDP recorded in 2020, which is by no means small. Furthermore, the decline in production at overseas factories due to the shortage of semiconductors is thought to have an adverse effect on the Japanese economy through declines in the export of Japanese intermediate goods and the decline in profits (reinvestment profits) of overseas subsidiaries.

⁸ Eiji Hakomori, "Automobile Sector 4Q FY20 Earnings Outlook " (Daiwa Securities Report, April 15, 2021)

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Chart 9

		2020			2021				2022				2023	FY2020	FY2021	FY2022
		Apr-Jun	Jul-Sep	Oct-Dec	Jan-Mar	Apr-Jun	Jul-Sep	Oct-Dec	Jan-Mar	Apr-Jun	Jul-Sep	Oct-Dec	Jan-Mar			
Real GDP	Q/q %; annualized	-29.3	22.8	11.7	-5.1	4.8	2.4	2.2	2.3	2.3	2.5	2.2	2.1			
	Y/y	-10.3	-5.8	-1.4	-2.1	8.1	3.3	1.0	3.0	2.3	2.3	2.3	2.3	-4.9	3.7	2.3
Private spending	Q/q %; annualized	-29.5	22.0	9.0	-10.7	6.4	2.4	2.7	3.4	3.8	3.8	3.4	3.3	-6.3	2.7	3.4
Private housing investment	Q/q %; annualized	2.0	-20.9	0.2	1.6	1.7	1.7	2.0	2.4	2.6	2.6	2.4	2.0	-7.3	0.0	2.4
Capex	Q/q %; annualized	-21.5	-9.2	18.2	-4.3	7.4	4.1	3.2	3.6	4.5	4.5	3.6	3.2	-6.8	4.0	3.9
Government final consumption	Q/q %; annualized	1.0	12.1	7.6	-3.6	0.6	0.6	0.4	0.4	-1.4	0.4	0.4	0.4	3.4	1.2	-0.0
Public investment	Q/q %; annualized	9.3	3.8	6.1	0.2	0.2	0.4	0.4	0.6	0.6	0.2	0.2	0.2	4.6	1.0	0.4
Exports	Q/q %; annualized	-52.9	33.2	52.4	4.5	9.5	9.6	5.6	5.0	4.9	4.5	4.1	3.6	-10.9	13.3	5.0
Imports	Q/q %; annualized	5.1	-29.0	17.0	-1.6	9.3	8.2	5.8	6.6	6.8	6.9	6.1	5.7	-6.7	4.4	6.6
Nominal GDP	Q/q %; annualized	-28.2	23.7	9.6	-5.4	6.0	3.3	2.7	2.9	2.9	3.3	3.0	3.0	-4.2	4.0	3.0
GDP deflator	Y/y	1.4	1.2	0.3	0.1	-0.2	-0.0	0.5	0.7	0.7	0.6	0.7	0.8	0.7	0.3	0.7
Industrial production	Q/q	-16.9	8.8	6.3	1.6	2.6	2.6	2.2	1.8	1.5	1.5	1.2	1.2	-9.8	13.0	6.8
Core CPI	Y/y	-0.1	-0.2	-0.9	-0.6	-0.0	0.8	1.3	0.8	1.0	0.6	0.7	0.9	-0.5	0.7	0.8
Unemployment rate	%	2.7	3.0	3.0	2.9	2.9	2.8	2.8	2.7	2.7	2.6	2.6	2.5	2.9	2.8	2.6
Trade balance (goods, services)	Y tril; annualized	-5.9	4.9	9.8	8.1	8.4	9.2	9.2	8.8	8.6	8.4	8.0	7.7	4.2	8.9	8.2
Current account balance	Y tril; annualized	8.9	16.6	25.1	24.7	24.3	24.4	24.7	24.4	24.0	23.4	23.0	22.5	18.9	24.6	23.3
Major assumptions																
Crude oil price (WTI futures)	\$/bbl	28.0	40.9	42.7	58.7	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	42.6	65.0	65.0
Exchange rate	Yen/\$	107.6	106.1	104.5	105.7	108.0	108.0	108.0	108.0	108.0	108.0	108.0	108.0	106.0	108.0	108.0

Source: Compiled by DIR.

Note: GDP through Oct-Dec 2020: actual; thereafter: DIR estimates.