

Japanese Automobile Industry in the Postpandemic Period

CHOWDHURY Mahbubul Alam* / KHONDAKER Mizanur Rahman**

Abstract

COVID-19 has had a devastating impact on the industrial sectors, such as automobile, energy and power, agriculture, education, travel and tourism, household electronics, and garment. Supply chain disruptions hit the automotive sector the hardest during the COVID-19 pandemic. Disruptions to parts and component suppliers caused by the pandemic forced Japanese automakers to make fresh production cuts within a few months in 2020. However, this sector has struggled to overcome the shortage in components in all automobile companies. Policymakers and government officials have implemented necessary measures, strategies, and economic policies to address the challenges posed by this current pandemic in various sectors. To combat this pandemic, the Japanese government has declared a state of emergency. Although the state of emergency has helped in limiting the spread of the disease, it has had a devastating impact on the country, upsetting the entire value chains in the most important industries, including the automobile industry.

1. Introduction

COVID-19 is a massive disruption quickly spreading worldwide, and the situation is changing rapidly. The outbreak of the COVID-19¹ virus is not only a massive health crisis but also an economic one. COVID-19 has had a tremendous impact on the Japanese economy, and the world economy is facing the worst crisis ever in the post-WWII era. The world's third largest economy, Japan, has been greatly pushed to the downside by the spread of the disease, being in a very severe situation that can be deemed a national crisis. The economy shrank 4.8% in 2020 versus 2019. In addition to the already huge decline in inbound tourism, overall exports of goods and services have decreased significantly. The emergency declarations, which ordered restaurants and bars to close early and urged companies to implement work-from-home

* CHOWDHURY Mahbubul Alam, 福岡女子大学・国際文理学部・国際教養学科・大学院・社会科学研究科教授

** KHONDAKER Mizanur Rahman, 南山大学経営学部教授, 福岡女子大学大学院・社会科学研究科非常勤講師

1 COVID-19, which originated in China, has so far killed 6,143,179 people and infected 480,047,174 people worldwide (March 26, 2022). The virus has infected people in 226 countries and regions. On May 5, 2022, Japan recorded 7.99 million confirmed cases of COVID-19 with 29,724 deaths (<https://www.business-standard.com/about/what-is-coronavirus>).

(WFH) schemes, temporarily stalled Japan's recovery in the first quarter of 2021. The government reimposed a state of emergency in Tokyo and other parts of the country between January and March in 2021, likely resulting in the negative growth in three quarters of the same year (The Japan Times, April 2, 2021). Growth will face some tough challenges. The pandemic and the war in Ukraine have fueled huge increases in Japan's food and energy costs. In fact, the Japanese economy, which was already struggling with low economic growth prior to the pandemic crisis, was affected by a sales tax hike from 8% to 10% in 2019. Moreover, typhoon Hagibis struck large parts of the country in the same year, causing approximately \$15 billion worth of damage (BBC, February 17, 2020). The COVID-19 crisis has damaged manufacturing facilities and has affected the production and sales of the automobile industry.

For instance, the COVID-19 crisis has compelled automobile-related companies to put their workers on short-term work during the lockdown. Many auto-retail stores have been closed for a month or more. As a result, the new vehicle market has shrunk by 396,346 units, a nearly 14% decrease from 459,456 units a year ago, and 32% decline in the second quarter of 2020 (JAMA, 2021a).

Although current literature related to the impact of COVID-19 on the market is scarce, existing empirical studies have provided an exciting result. The pandemic has also highlighted the widening gap in economic performance between countries and sectors. Some industries hit hard, such as the hotel, airline, and transportation sectors, have been struggling to gain ground. Under these circumstances, the Japanese government must keep an eye on those sectors and must consider policies to continue extending support (The Japan Times, April 2, 2021).

This paper draws on research carried out in the context of the Japanese automobile industry in the post-COVID-19 pandemic period, with the business operations of all its associated companies facing the biggest challenge. The discussion is organized as follows. Section 2 describes the situation of the automobile industry in Japan during the COVID-19 pandemic period. Section 3 examines postulated changes in vehicle buying behavior in the post-COVID-19 period. Section 4 presents the strategies adopted by Japanese automobile manufacturers during and after the COVID-19 period. Finally, Section 5 concludes the paper.

2. Situation of the Automobile Industry during COVID-19 in Japan

The automotive industry is an essential pillar of Japan's economy. Japan is still home to eight auto-makers, namely, Toyota, Honda, Nissan, Subaru, Suzuki, Mazda, Daihatsu, and Hino. All automobile industries have more than 78 factories in 22 different areas of the country. This sector has contributed to exports in value terms amounting to 12.8 trillion yen in 2020, auto-related employment in 5.49 million people, and approximately 89% of the country's manufacturing sector² (JAMA, 2021a). It is a highly

2 In 2019, agriculture contributed around 1.01% of Japan's GDP, industrial sector contributed 28.75%, and the service sector contributed 69.3%.

innovative and technologically driven industry, with increased production of hybrid and electric vehicles on domestic and global markets.

The following are the major effects of the COVID-19 crisis on primary sectors in Japan: (1) a decrease in inbound tourists (foreign tourists visiting Japan)³ and its consumption; (2) disruption of the supply chain, (3) automobile industry, and (4) semiconductor industry; (5) decline in exports and willingness for capital investment as the global economy deteriorates; and (6) economic downturn due to the deterioration of economic activity. Among these, supply chain disruption would be more strongly associated with logistics.⁴ The pandemic's potential impact on the vehicle aftermarket encompassing parts, accessories, and tire sales reviewed both past and current trends.

The COVID-19 pandemic has made a huge dent in automobile production among major Japanese companies, including Toyota, Nissan, Honda, Suzuki, and other motor companies. The automobile industry in Japan has to close factories, the supply chain has been disrupted, and market demand has declined. According to the Daiwa Institute of Research, the COVID-19 crisis has reduced automobile industry production, resulting in a total economic loss of 1.2 trillion yen, and the real GDP for fiscal 2021 will be reduced by 300 billion to 600 billion yen (The Asahi Shimbun, September 24, 2021).

Additionally, the automobile industry faced other issues such as Russia launching a military invasion of Ukraine on February 24, 2022, which has contributed to prices rising of energy, in the worldwide. Oil prices skyrocketed to over \$110 per barrel in the middle of March 2022 (Kyodo News, March 28, 2022). In Japan, the higher commodity prices and the yen's depreciation (i.e., 130 yen per the dollar mark in late April 2022) for the first time since early 2002, especially against the U.S. dollar, have raised concerns regarding higher import costs (Kyodo News, March 28, 2022). Under these circumstances, the following are the numerous challenges facing the Japanese automobile industry.

1) Impact on Production

The automobile industry in Japan has been facing challenges caused by the spread of COVID-19; it forced plants to shut down, disrupted the supply chains, and quarantined workforces. Most industries have shut down their production plants for a definite period, causing a severe impact on the Japanese automo-

3 Japan made greater efforts to build a barrier against the influx of COVID-19 cases from other countries. The Japanese public health authority imposed “*mizuguiwa sakusen* (水際作戦),” which refers to the military doctrine of repelling invaders as soon as they arrive on the shore. Japan has developed a disease prevention approach based on the concept of “*mizuguiwa*,” with the goal of preventing the importation of infectious disease into Japan.

4 The problems are almost resolved now, but at one point, paper products such as toilet paper and tissues were sold out in many Japanese retail stores. Most of the paper products are domestically produced. However, some people who were misled by rumors spread on SNS that Chinese imports would cease suddenly rushed into stores and purchased those products, a practice known as “panic buying.” Meanwhile, about 80% of masks are imported, with the majority coming from China. In other words, because Japan is heavily reliant on China, it is easily affected when something happens in China.

bile industry.

Subaru canceled an ice driving event in northern Japan, and Toyota recently canceled a media test drive of the all-new Yaris scheduled for mid-February 2020. Meanwhile, Nissan has halted production at its Tochigi plant, which manufactures the Skyline sedan and Infiniti models, and plans to close in May 2020 because of a shortage of parts from China. Its plant in Kyushu, southern Japan, operated only during the day shift in April and May of that year and shut down for four days. Honda Motor also stopped production at some of its domestic plants at the same time (Ferber, 2020).

During the shutdown, new vehicle sales and production have witnessed a significant fall (**Table 1**). The fire disaster in Renesas Electronics Corporation on March 19, 2021, a premier supplier of advanced semiconductor, affected production (The Japan Times, November 8, 2021). Vehicle production was 8.07 million units in 2020, down by 16.7% from 2019. Passenger car production dipped 16.4% to a total of 6.96 million units, with standard cars decreasing 21.1% to 4.19 million units, small cars fall 8.3% to 1.41 million units, and minicars drop 7.8% to 1.36 million units. Meanwhile, truck production declined 15.8% from the previous year to 1.04 million units, and bus production sank 43.1% to 70,000 units (JAMA, 2021a).

Table 1: Production, Sales, and Export during COVID-19

(Unit: Vehicles)

Year	Month	Production				Sales	Export
		Cars	Trucks	Buses	Total		
2022	Jan-Mar	1,648,522	56,957	19,633	1,960,009	1,197,229	903,358
2021	Jan-Mar	1,927,470	78,373	18,589	2,261,766	1,429,743	1,038,243
	Apr-Jun	1,650,733	64,790	19,108	1,961,611	1,034,843	983,407
	Jul-Sep	1,363,227	59,090	17,073	1,641,636	1,015,516	827,068
	Oct-Dec	1,677,796	59,462	18,889	1,981,945	968,238	970,192
2020	Jan-Mar	2,044,964	288,741	26,475	2,360,180	1,371,726	1,108,366
	Apr-Jun	1,049,773	197,632	13,052	1,260,457	836,050	513,602
	Jul-Sep	1,806,311	255,166	13,758	2,075,235	1,192,491	939,461
	Oct-Dec	2,059,363	296,192	16,516	2,372,071	1,198,348	1,179,403
2019	Jan-Mar	2,202,596	325,080	27,494	2,555,170	1,528,215	1,212,471
	Apr-Jun	2,072,479	315,475	29,594	2,417,458	1,225,205	1,193,019
	Jul-Sep	2,073,908	297,113	32,236	2,403,257	1,396,265	1,195,515
	Oct-Dec	1,979,773	295,249	33,387	2,305,409	1,045,531	1,217,127
2018	Jan-Mar	2,192,402	303,689	25,126	2,521,217	1,303,911	1,192,388
	Apr-Jun	1,987,712	306,658	29,780	2,324,158	980,112	1,189,168
	Jul-Sep	1,973,592	303,801	28,246	2,305,639	1,075,084	1,443,939
	Oct-Dec	2,203,514	330,299	29,175	2,562,988	1,023,851	1,291,975

Source: JAMA <https://jamaserv.jama.or.jp/newdb/eng/index.html>

2) Impact on Domestic Sales

Reduced vehicle sales emerged as one of the critical challenges facing the automobile industry during COVID-19 (**Table 2**). **Table 2** shows the COVID-19 and year-on-year changes of total sales from 2019 to 2021.

Table 2: Sales of Vehicles During COVID-19

(Units)

Year	Month	Passenger Cars				Trucks			Buses	Grand Total
		Standard	Small	Mini	Total	Standard	Small	Total	Total	
2022	Jan -Mar	386,332	264,867	337,487	988,686	35,253	59,734	206,614	1,929	1,197,229
2021	Jan -Mar	462,400	302,072	432,351	1,196,823	47,255	68,699	230,268	2,652	1,429,743
	Apr -Jun	329,291	217,509	299,742	846,542	36,544	54,163	187,008	1,293	1,034,843
	Jul -Sep	335,443	222,517	272,068	830,028	40,708	58,893	183,910	1,578	1,015,516
	Oct -Dec	319,521	211,109	271,675	802,305	33,274	49,540	164,576	1,357	968,238
2020	Jan -Mar	399,391	348,450	400,613	1,148,454	46,483	66,287	219,162	4,110	1,371,726
	Apr -Jun	224,102	226,481	226,945	677,528	32,846	49,809	156,787	1,735	836,050
	Jul -Sep	350,437	278,748	362,783	991,968	41,288	58,309	198,598	1,925	1,192,491
	Oct -Dec	396,825	254,398	340,808	992,031	40,061	57,278	204,753	1,564	1,198,348
2019	Jan -Mar	469,580	366,443	440,336	1,276,359	50,800	75,525	247,373	4,483	1,528,215
	Apr -Jun	365,644	294,635	349,064	1,009,343	42,104	63,252	212,980	2,882	1,225,205
	Jul -Sep	432,597	327,736	395,124	1,155,457	53,969	73,250	237,137	3,671	1,396,265
	Oct -Dec	318,521	246,730	294,681	859,932	35,518	54,980	183,049	2,550	1,045,531

Source: JAMA <https://jamaserv.jama.or.jp/newdb/eng/index.html>

The passenger car and commercial vehicle demand was 4.60 million units in 2020, a decrease of 11.5% from the previous year. Total passenger car sales shrank 11.4% to 3.81 million units, with standard cars falling 13.6% to 1.37 million units, small cars dropping 10.3% to 1.11 million units, and minicars declining 10% to 1.33 million units. Meanwhile, sales of trucks fell 11.5% from 2019 to 779,000 units, and sales of buses dropped 31.3% to 9,000 units (JAMA, 2021a).

In fact, sales have been 4,598,610 units in 2020, a decline of 11.6% compared with 2019. According to the Japan Automotive Dealers Association and the Japan Light Motor Vehicle and Motorcycle Association, sales in both January and February 2021 were down in the double digits compared to the previous year, falling 14.8% with 1.02 million units and continuing to fall 19.2% from October to December with 968,238 units. Full-year sales in 2021 were 4.45 million, a 3.3% decrease from the previous year (JAMA 2021b). It was an optimistic assumption that in 2021, domestic automobile markets and industries worldwide were preparing for a partial recovery in 2022.

3) Impact on Exports

The Japanese automobile industry has limited use of inventories produced using a lean and just-in-time manufacturing process. Owing to shortages of inventories that will affect their production capabilities and exports of all kinds of Japanese vehicles will decline. The vehicles' export also affects the COVID-19 crisis in Japan, particularly in the first half of 2020 (Table 1).

According to JAMA (2021), automobile exports fell 19.7% from 2019 to 12.8 trillion yen in 2020 and imports fell 18.8% to 2.0 trillion yen. Table 1 depicts the three-month-to-three-month change in total exports from 2019 to 2021. Base vehicle exports to North America decreased from the previous year to 1.53 million units in 2020; Europe, 676,000 units; Asia, 560,000 units; Oceania, 363,000 units; the Middle

East, 325,000 units; Latin America, 178,000 units; and Africa, 99,000 units (JAMA, 2021a).

4) Impact on the Supply Chain

As mentioned above, COVID-19 disturbed the supply chain not only in Japan but also in the world. Because of its ties to several key segments, the automobile industry is regarded as a barometer of the economy. Parts suppliers, which are primarily small- and medium-sized businesses, have also grown to be a significant part of Japan's economy, spreading into other industries such as chemicals, textile, rubber, steel, iron, aluminum, plastic, glass, carpeting, and computer chips. The automobile industry, along with the auto component industry, has become dependent on the supply chain. Automakers with global supply chains are expected to observe two and three tier dealers who are primarily affected by epidemic-related disruptions. Delays in delivery could have a wide-ranging impact on the market, including delayed new car model launches, shattered supply chains, financially drained SMEs, and lower vehicle sales in 2020.

5) Impact on Employment

The Japanese automobile sector employed more than 5 million people in 2020 (JAMA, 2021a). The employment situation in Japan has deteriorated sharply because of the social distancing and temporary business closures resulting from the COVID-19 pandemic. There were many companies that had to resort to massive layoffs, which emerged as one of the crucial challenges of the automobile market. There was an impact more serious than the global financial crisis in 2008. By sector, retailers and wholesalers lost 845,000 jobs, manufacturing 614,000 jobs, and accommodation and restaurants had 589,000 jobs (The Japan Times, May 21, 2020).

3. Postulated Changes in Vehicle Buying Behavior in the Postpandemic Period

The fundamentals a customer buying a new or used car at a dealership did not change much postpandemic in Japan. Every shop maintains physical distance and uses plexiglass barriers to protect their staff and customers. Nowadays, most shoppers go to dealerships, find the vehicle they wanted, take a test drive, then hash out a price and finance deal with the salesperson and order a new or used car. It has also changed the economic and social process, altering people's behavior toward the purchase of products and services as follows.

1) Avoid Public Transport

There will be many changes in the consumer's behavior of post-COVID-19. The usage of private cars, walking, and biking has gained numbers since the pandemic began, and buses and other public transportation ridership has declined. With the advent of COVID-19, consumers were witnessed to be more concerned regarding maintaining personal health and hygiene. However, despite encouraging vaccine,

numerous risks remain and continue to predict that sales will be difficult rebound to pre-COVID levels within a short time. According to Takuto Murase, senior economist at the Japan Research Institute, the return of Japan's economy to prepandemic levels will be approximately a year behind that of the United States, as the vaccine rollout in Japan — one of the slowest among developed countries — is putting it at a disadvantage when it comes to achieving a speedy economic recovery (The Japan Times, April 2, 2021). Governor Haruhiko Kuroda, Bank of Japan stated that steady progress in vaccinations and an end to state-of-emergency curbs to combat the pandemic are likely to lead to a recovery in consumption and the economy would continue to recover and reach levels seen before the coronavirus pandemic by 2022 (Reuters, Tokyo, September 30, 2021). After the relaxation of state emergency and quasi-emergency, private transportation is preferred rather than public transportation system.

2) Increased Sales of Used Cars

There is a boom in used car sales going on due to COVID-19. The demand for used cars is extremely high, particularly for those four years old or newer. These vehicles have many of the latest automobile technologies but are not as expensive as new ones. This includes preowned electric and hybrid automobiles. Dealerships now stock certified preowned vehicles that look, feel, and function like new vehicles but cost much less. Consumers are not willing to spend a huge amount on buying new cars; rather they prefer buying affordable used cars, which helps them maintain their health by spending less.

3) Increasing Demand on Fuel-Efficient Vehicles

The demand for electric vehicles (EVs) has increased because of a higher focus on deliveries, increasing charging points, and possibility to charge EVs at home. Additionally, during the COVID-19 situation, people hesitated to go out to fill-up gasoline from a gasoline station. Although crude oil prices plummeted, especially after the Ukraine and Russia war, this was not associated with any positive trend in vehicle sales. Japanese manufacturers seem to favor gasoline-electric hybrids over all-electric vehicles. There is still insufficient infrastructure and battery capacity for EVs. Electric charging stations are more prevalent in urban areas than in rural areas. In response to this issue, the government has increased EV subsidies and plans to install 150,000 charging stations by 2030 (Tokyoesque, 2022).

4) Financial Squeeze or *Setsuyaku*

Consumers are concerned regarding the future impact of the COVID-19 in terms of health and the economy. They do not want to spend much money on items that are not very necessary. Japan's government has tried to offsetting the effects of price increases with large government subsidies for fuel and cash handouts for families with children. However, Japanese consumers, fearful of the pandemic's economic consequences, have largely redirected stimulus funds into savings. According to the Cabinet Office, the household savings rate has increased from 2.8% in fiscal year 2019 to 11.8% in fiscal year 2020 (The

Japan Center for Economic Research, JCER).

As a result, the change in consumer buying behavior is the “financial squeezed” moment. As previously stated, job losses and salary cuts have had an impact on the luxury purchasing habit. Prior to the pandemic, buyers’ top priorities were found to be quality, price, and brand. During the pandemic, however, the priorities were availability, price, and quality. This showed how economic conditions and safety were the major concerns for buyers, changing their behavior.

People prioritized necessity products more than luxury ones. Brand-wise, this year leader Toyota gained 0.4% market share and Suzuki (-3.6%), keeping 13.7% share place second, followed by Honda, which lost 0.4% share, falling 6.4%. Daihatsu remained in 4th place and lost 3.4%, followed by Nissan, which lost 3.6%. Mazda remained in 6th place and lost 11.2%, followed by Subaru (-4%) and Mitsubishi, which reported the best performance in the leaderboard and gained 10.5% sales. Isuzu lost 5.5% and Hino was in last place, losing just 0.1% in 2021 (JAMA, 2021b).

5) Increasing Online Purchasing

During the early stage of COVID-19, consumers started moving more toward online purchase to buy things that can keep them engaged for long. It was the beginning sign of a change in online shopping behavior. During the early stage of COVID-19, consumers started moving more toward online purchases to buy goods that can keep them engaged for long. Buyers can shop at their convenience, explore and select the features they want on a vehicle, and obtain the financing they require using a computer or smartphone. Additionally, vehicle dealerships now offer online sales, let online buyers use virtual walk-around technology, facilitate at-home test drives and do home delivery of vehicles they sell.

4. Strategies Adopted by the Automobile Industry in the Postpandemic Period

Japan already has the experience in several crisis management and overcome such crises by adopting suitable technology, innovation, and strategies. COVID-19 has created new realities for every industrial sector, including the automobile industry. They will need to adopt new technologies and ways of working system. Since the second world war, the country has faced various crises like the oil crisis 1970s, the trade conflict with the USA in 1980, the economic bubble burst in the 1980s, the Asian currency crisis of 1997, economic stagnation from the 1990s to the early 2000s, anti-Japanese demonstrations in China in 2005, the global economic crisis in 2008, and the continued trade conflicts between the USA and China. Although natural disasters, such as earthquakes, tsunamis, typhoons, volcanic eruptions, floods, landslides, torrential rains, and heavy snowfalls, are common, others will inevitably occur that are potentially even more disruptive to the country’s industrial sector and automobile industry (Khondaker and Chowdhury, 2021, p. 251). A major earthquake and tsunami in Japan have added to the already-strained global automobile supply chain, which is still dealing with the COVID-19 pandemic and Russia’s ongoing invasion of

Ukraine. However, Japan has recovered from the above crisis and disaster through preparation for future ones, and need to rethink their plans, policies and strategies.

During the COVID-19, Japan did have not a lockdown but had states of emergency and quasi-emergency that focused instead on asking restaurants and bars to close early. The Japanese central and local governments have enforced health and safety regulations, making manufacturing shutdowns one of the automobile industry's most significant challenges. During the early stages of the pandemic, all auto plants across the country were forced to shut down for extended periods of time. The industry moved to either cancel or postpone automotive events to avoid creating potential venues where infected people could spread the COVID-19.

COVID-19 in Japan has affected several waves and the country has adopted the prevention of spread infection (*manen boshi*) in several prefectures. The supply chains disrupted the components and raw materials required for the automobile industry. As a result, production and sales of the automobile industry have declined. Although the Japanese automotive industry showed signs of recovery in the early months of 2021, with the average annual vehicle market increasing from 5 million units in 2021 to 8 million units. This would add 7.2 trillion yen to the value of automobile shipments, create new jobs, and inject more money into the entire value chain. According to JAMA (2022), during the two years of the COVID-19 pandemic, the auto industry created 220,000 new jobs. Furthermore, tax revenue would rise by 2.5 trillion yen, which is equivalent to 1% of what is supplied to public coffers by the consumption tax (JAMA, 2021a).

The situation is improving; vehicle dealers are becoming busier, and many are eager to acquire additional inventory to sell (McKinsey & Company 2021). However, the second half of 2021 was negatively affected by supply shortages and the sudden appearance of the Omicron variant. Additionally, the war between Russia and Ukraine increases the risk of ripple effects across the automobile industry and reduces global production of new vehicles by millions of units in 2022 (CNBC, 2022). Among these issues was a 7.4 magnitude earthquake that struck northern Japan in the middle of March 2022. As previously stated, the automobile industry was immediately affected, including Toyota and Renesas Electronics, a major supplier of semiconductor chips (CNBC, 2022).

Under these conditions, Japan's Prime Minister Fumio Kishida announced plans to lift coronavirus restrictions completely on March 21st, 2022, as new infections caused by the highly contagious omicron variant slowed. It was the first time Japan had been virus-free since early January of 2020. Additionally, Japan has gradually accepted entrance of foreigners and finally opened for travelers from June 10, 2022. The country has opened up to travel to agencies from 98 countries with a low risk of COVID-19 infection. Overseas tourists no longer need to be tested and quarantined, but there are some rules set up for overseas tourists who must wear masks, purchase medical insurance that covers COVID-19 and be accompanied by a tour guide (Kyodo News, May 26, 2022). As the global economy begins to recover, it will be necessary to manage the risk of spreading COVID-19 while allowing for international travel. This situation

exacerbates the numerous challenges to overcome by adopting the following strategies and rethinking.

1) Strategies Concerning Worker Safety

There have been pauses in production, but no major shutdowns in Japan. According to JAMA (2021a), automakers and their suppliers have used more than 5.5 million people all over the country. During and after the pandemic, welfare of employees was a major safety concern for corporate leaders. All industrial sectors prioritize the safety and security of customers, employees, and other stakeholders. The automobile industry has been implementing measures based on guidance received from government authorities to help prevent the spread of COVID-19 infections. Such guidelines might include enhanced health surveillance, restrictions on communal tools and areas' use, additional personal protective equipment where necessary, regular sanitization of equipment, and periodic deep cleans of whole workplaces. Workers also fill out a health questionnaire before reporting to work, have their temperatures taken, wear masks or face shields, maintain physical distance, work and eat separated by plexiglass, and work in staggered shifts (McKinsey & Company, 2020a).

2) Strategies Concerning Working from Home

The world had more than two years of experience of pandemic. Business organization and automobile companies have been trying to get back to normal to reduce the economic burden of the pandemic. These circumstances have drastically changed the adaptation process for the entire world and working lifestyle. Some companies have adopted work from home (WFH), and some have introduced a hybrid working model, using daily shift briefings, visual management and telework. In the professional job, WFH, was often seen in many companies before-COVID-19 in Japan. However, the number of WFH increased, especially when the “state of emergency” was issued in April 2020.

The WFH comes with challenges and concerns but also has favorable aspects. The Japanese government has encouraged workers to work from home, but efforts have been ineffective thus far; in comparison to other advanced nations, workers continue to commute to offices. Commuter trains in Tokyo and other major cities were pretty jam-packed during COVID-19, and many businesses are acting as if nothing has changed (The Washington Post, 2020). The Japan Productivity Center (Tokyo-based nonprofit organization) shows that WFH is only 20% across Japan, just 10% higher than pre-COVID-19. By comparison, 44% of Americans do WFH during the pandemic, up from 17% (The Fortune, 2021). According to the Morikawa survey, WFH for the information and communications industry was highest (59.6%), whereas that for the manufacturing industry was the lowest (18.8%). By firm size, large firms have higher percentages than small firms, and by region, firms headquartered in Tokyo have a high share of teleworkers (Morikawa 2021). The poor physical environment suitable for WFH has the lack of Wi-Fi, IT equipment, and others. **Table 3** shows the factors affecting adoption WFH. But Japan has the world's first affordable “fast as light” broadband connection to most homes for last 20 years. Additionally, changing the work

habits of Japanese corporations is not easy. Evaluating employees still relies heavily on office presence. Japan's work culture demands constant face-to-face interaction, partly to show respect. Employees are typically judged in the hours they put in, rather than their output.

Table 3: Factors affecting adoption and productivity of work from home

Factors	Percentage	Survey of employees (%)
Poor telecommunication environment at home relative to the workplace	60.8	34.9%
The requirements by rules and regulations that some tasks must be	57.7	33.1%
Some tasks cannot be conducted at home even though these are not required by rules and regulations	76.1	32.5%
It is difficult to concentrate on job because of the presence of family	33.0	19.9%
Lack of a private room specifically designed for work	36.9	15.1%
Loss of quick communication that is only possible through face-to-face interactions with their colleagues at the workplace	46.0	38.5%
Lack of pressure from the boss, colleagues, and subordinates	36.4	19.3%
Much of the work requires direct interaction with customers	34.3	—
Other reasons	4.1	10.2%

Notes: Multiple choices (N = 781). The survey of employees is taken from Morikawa (2020).

Source: Morikawa (2021), 24.

The provision of 'WFH' will bring about benefits like reducing overheads and also help maintain social distancing norms during a given period without reducing the workforce or requiring more space. Further, this will also create employment opportunities for the women who were constrained to staying at home for various reasons. Prepandemic, Japan's workforce faced longstanding problems, like chronic overwork, low productivity. Letting employees WFH may have helped these problems and prevented the spread of COVID.

3) Rethinking Working from Home in the Postpandemic Period

COVID-19 has affected workplaces worldwide. But its impact on Japan might be larger than that in the rest of the world. The country has traditionally been for long working hours in the office until late at night, even coining the term "*karoshi*" death caused by work stress. As a result, the pandemic could be the start of a new era in the workplace. By requiring and bringing the concept of social/physical distancing, the pandemic has changed and will reshape working styles, work hours, and workplace furniture. Adapting to a postpandemic "new normal," where (WFH) or hybrid working seems a more viable option, has evolved into a way of life. Hybrid working gives people more freedom and changes how they spend their time—commuting time can be used for more productive or meaningful tasks. As a result, these operators must change their schedules and lower the number of public vehicles during the busy hours. To implement new ways of working, it is important adopta to hybrid working model, a combination between on-site and off-site, to find what works best for each company or business.

Post-COVID-19 companies are reconsidering physical-distance and remote-working policies, which

will make these traditional approaches more difficult, compelling companies to find new ways to manage shop-floor performance (McKinsey & Company, 2020b). Fujitsu must adapt to a postpandemic “new normal” in which WFH appears to be a more viable option (Nikkei Asia, 2021). When the government declared a state of emergency last April, Honda Motor allowed nearly 30,000 employees to WFH. As a result, even after COVID, the WFH arrangement may be widely adopted as a new work style. Some companies are rethinking the possibility that the WFH system become a new work style even after COVID-19. Further development of IT infrastructure and revisions of rules and regulations hindering WFH are required. Additionally, using new communication tools, such as teleconference systems, should be considered depending on their advantages and disadvantages relative to face-to-face communications (Morikawa, 2021, p. 14). To comply with social distancing rules, some companies may require their employees to work in shifts. In such cases, it is critical to develop and implement best practices for WFH to maintain a high level of productivity, achieve a good work-life balance, and maintain good physical and mental health.

4) Strategies of Supply Chains Diversification and Renationalization

Many Japanese companies have been shifting production to their own country, and they will now consider ways to diversify their supply chains in view of the risks posed by global trade and the desire to produce closer to their markets. They will then manufacture in smaller quantities at decentralized locations. Indeed, the postpandemic period has forced a rethink of how automobile industries source components globally. The pandemic will force a renationalization of global supply chains to protect against future shocks. Industries will need to identify any risks of failure in the supply chain, such as a border closure or a natural disaster/pandemic affecting the higher tiers of the supply chain. Renationalization of global supply chains does not make countries more resilient to pandemic-induced labor supply contractions. It will need to be innovative in both efficiently producing goods with fewer workers and offering value-added products. As mentioned above, China is an immense source of supply chain. COVID-19 induced factory shutdowns in China. Japanese Economy Minister Yasutoshi Nishimura stated that “We have become dependent on China,” and “We must make supply chains more robust and diverse, broaden our supply sources and increase domestic production.” (Reuters Tokyo, June 9, 2020). They must have a physical presence in China because much of what produce is ultimately destined for the Chinese consumer, as well as to meet the demands of ‘just-in-time’ production, which prioritizes short delivery times for efficient manufacturing.

Under these circumstances, the Japanese Ministry of Economy, Trade and Industry is funding companies to assist them in investing in new plants that make crucial products and materials to alleviate the risks of supply-chain bottlenecks. The government also approved 774 billion yen (US\$6 billion) in funding for domestic semiconductor investment in November 2021. The package, which is part of an extra budget for this fiscal year approved by the Cabinet is divided into three parts: 617 billion yen to fund domestic

investment in cutting-edge chip the manufacturing production capacity, 47 billion yen for legacy production such as analog chips and power management parts, and 110 billion yen for the R&D of next-generation silicon (The Bloomberg, 2022). It is also offering 23.5 billion yen to Japanese firms to strengthen and diversify supply chains in Southeast Asia countries (Reuters Tokyo, June 9, 2020).

5) Rethinking Just-in-Time

Just-in-time (JIT) manufacturing processes have spread their influence across the country and around the world. Toyota, the Japanese automaker, introduced the world to JIT inventory, an efficient and cost-saving management strategy. The cost savings from the famous “Toyota Way” of lean manufacturing, which is based on having as little inventory as possible for JIT production and eliminating waste, assist producers in accurately forecasting demand (The Economic Times, June 20, 2020). Although pricing and cost will always drive factors in sourcing decisions, automotive companies are beginning to lessen their focus on sourcing and JIT delivery from the lowest cost supplier (Reuters Events, July 3, 2020).

During COVID-19, the supply chain began to shut down, halting production in all sectors and closing borders. As a result, the JIT system quickly proved unsuitable for dealing with a lack of inventory and its impact on production. Postpandemic JIT system is rethinking to determine the way of inventory solution. Diversification of production sourcing, including both domestic and international markets and “dual sourcing” of the same production from suppliers in different countries, should help prevent the spread of negative shocks through supply chains.

However, Hayakawa and Mukunoki (2021) suggest that addressing the supply chain effect is most important for easing the impacts of the COVID-19 pandemic on trade. It does not mean that firms should shift their input sourcing from foreign suppliers to domestic ones. The localized sourcing of products instead exacerbated the negative impacts of COVID-19 on the domestic economy.

5. General Remarks and Conclusion

The ongoing COVID-19 pandemic has affected and is still affecting economies and societies across Japan. COVID-19 has created an economic situation different from any previous crisis. The pandemic has considerably created a significant effect on the supply chain of automotive may be considerable. The resultant economic ambiguity has reduced customer requirements in the short term, leading to dampened sales of a new vehicles and delayed additional maintenance.

The end of the state of emergency coupled with the rollout of COVID-19 vaccines will also allow a return to normal life in Japan. During the emergency in Japan, many employees of different sectors, including the automobile sector, cannot go to their workplaces and need to WFH. The COVID-19 pandemic is expected to force long-term changes in how companies manufacture vehicles. Factory floors may need to be redesigned to accommodate social distancing, mask use, and other infection prevention

measures. Indeed, the automotive industry experienced ‘chip shortages’ as a result of supply shortages in 2020–2021, but now that supply chains are stabilizing, the Japanese automotive market is expected to not only recover, but also to boost the overall Japanese economy (Tokyoeseque, 2022). Instead, all restrictions are voluntary and nonbinding, a tactic that benefits industrial sectors that will not be affected economic jeopardy in this country.

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