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**THE ASEAN AUTO INDUSTRY:
BEYOND THE CORONAVIRUS PANDEMIC**

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ABSTRACT

This paper provides an overview of the Coronavirus pandemic (COVID-19) situation of the automotive industry in some Association of Southeast Asian Nations (ASEAN) countries where enforced lockdowns and social restriction have come with real human costs in the areas of economic development. The COVID-19 state of the ASEAN automobile industry will be explained by putting into global context, including the strategy of beyond COVID-19. In general, COVID-19 has likely to affected the automotive industry in production, markets and supply chain. There is production in ASEAN markets that is mainly based on assembly of imported completely-knocked-down (CKD). The distinct effects of COVID-19 on automobile production, sales and export within the ASEAN region.

This paper examines the impact of the COVID-19 pandemic on ASEAN in the automotive industry. The goal is to provide a comprehensive view of importance of automobile industry, examine strategies impact on the recent pandemic, and

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provide a picture of where the industry is headed, particularly in light of the increasing importance of both production and consumption in ASEAN nations.

Keywords: ASEAN, Motorization, Pandemic, Automobile, Strategies.

1 . Introduction

The Association of Southeast Asian Nations (ASEAN) is a group of ten countries (Brunei, Cambodia, Indonesia, Laos, Malaysia, Myanmar, the Philippines, Singapore, Thailand, and Vietnam) that formed the organization in 1967 to promote regional cooperation in southeast Asia. With continued economic growth and increasing cooperation and collaboration among ASEAN nations, the region is playing an increasingly important role in the global automobile market. The ASEAN region represents over 642 million people, accounting for over eight percent of the world's population, and is the world's fifth largest economy measured by Gross Domestic Product (GDP), after the United States (GDP US\$21.4 trillion), China (GDP US\$14.4 trillion), Japan (GDP US\$5.1 trillion), and Germany (GDP US\$3.9 trillion) (ASEAN Secretariat). The automobile industry has been an important driving force for ASEAN economies, contributing at least \$177 billion to GDP and creating 2.4 million jobs in the region (ASEAN-Japan Centre, 2020). In the six years period prior to the outbreak of the COVID-19 pandemic, annual GDP growth averaged close to six percent. According to the Organization for Economic Cooperation and Development (OECD), the middle class in ASEAN countries has been increasing and is expected to more than double from 135 million in 2010 to 334 million by 2030 (OECD, 2020a) however, the pandemic is threatening to push millions of people in ASEAN countries back into poverty.

The World Economic Forum (2020) stated that due to the COVID-19 pandemic, vehicle manufacturers have experienced disruptions in various business areas including domestic sales, exports, and supply chains. The auto

industry has faced serious challenges, with manufacturing activity in Asian countries and elsewhere contracting sharply in the first quarter of 2020, with official measures plunging to the lowest levels on record. Automakers have poured billions of dollars into Southeast Asia, large vehicle market, over the past decades in a bet on its growth potential. As a result of restrictions brought on by the pandemic, some companies have accelerated their online and direct-to consumer sales as people are not using their cars as much because they are working from home and shopping online (Agrawal, *et al.*, 2020; Wang & Wells, 2020).

The purpose of this study is show how five ASEAN countries (Indonesia, Malaysia, the Philippines, Thailand, and Vietnam) have been affected by changes in the automotive industry brought on by the COVID-19 pandemic. We highlight growth in the industry, trends in motorization, factors contributing to motorization and the likely implications for society using mostly secondary and archival material. The remainder of this discussion is organized as follows: Section 2 explores the economic factors of motorization in ASEAN countries, Section 3 describes the automobile industry prior to the coronavirus pandemic in ASEAN countries, Section 4 analyzes the automobile industry's resilience in recovering from the impact of COVID-19, and Section 5 summarizes the study's general findings.

2. Economic Factors of Motorization in ASEAN Countries

The automobile industry plays a leading role in Asia, and has a notable impact on industrialization in ASEAN countries. Due to its deep linkages with several key segments of the economy, the automobile industry has a strong multiplier effect on growth in ASEAN countries and hence is capable of being a key driver of economic growth in the region. The ASEAN region is considered an important production hub for the entire automotive sector, including cars,

motorcycles, trucks, and buses, and their various components. With the automobile industry supporting economic development and industrialization, ASEAN countries hope that developing their automotive manufacturing capabilities can facilitate other industrial development; however, differences in political and economic histories and unequal degrees of industrialization in these countries have led to varying results.

Dicken (2007) describes the automobile industry as the “the industry of industries” in the twentieth century and it remains one of the most global industries today. The automotive sector has contributed to development in the transportation and industrial sectors, and generates substantial employment opportunities. ASEAN has the world's third largest labor force and its middle class makes the region a powerful engine for long-term economic growth (ASEAN, 2021).

The number of vehicles in the ASEAN region has more than doubled since 2000, greatly increasing motorization. This has led to further economic growth in ASEAN countries, increasing personal incomes and improving the affordability of vehicles. The personal income variable is typically an important factor in aggregate demand. Dargay and Gately (1999) show the close relationship between passenger cars per unit population and GDP per capita in a country. Using data for both developed and developing countries they find a positive relationship between per capita income and vehicle ownership of vehicles, and determine that per capita income of between US\$3,000 and US\$5,000 is needed to afford a private vehicle (Dargay and Gately, 1999). Barter *et al.*, (2003) point out that in addition to the level of personal income, factors such as land use characteristics, transportation-related policies and infrastructure development can also affect city dwellers' decisions with respect to passenger vehicle ownership as a mode of transport. Paullery *et al.*, (2006) find that several factors contribute to motorization. First, increased income leads to an increase in passenger vehicle ownership, for those who have attained a

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threshold level of income for vehicle ownership. Second, an increase in vehicle ownership reduces the demand for various modes of public transportation. Third, the sign and magnitude of demand elasticities for public transport with respect to income vary as a function of income level. Fourth, income growth is expected to increase the average length of trips taken in privately owned vehicles.

The above analysis of the factors that contribute to motorization in the ASEAN-5 countries shows that an average income of at least US\$3,000 is needed to attain automobile ownership. Table 1 shows the minimum income level (measured as GDP per capita) for the ASEAN-10 countries at which ownership of a vehicle becomes widely accessible and vehicle sales notably increase. Brunei, Malaysia Indonesia, and Thailand have achieved a higher level of motorization than the rest of the ASEAN countries. Although the development of the ASEAN automotive market is not as dramatic as in China, the region's automobile industry is growing steadily. Table 1 shows that Brunei has 963 vehicles per 1,000 population and Malaysia has a similar number, 925 vehicles per 1,000 population. Thailand has 599 vehicles per 1,000, Indonesia

Table 1: GDP Per Capita and Vehicle Registered Per 1000 People in ASEAN Countries

Country of ASEAN	2001		2005		2010		2015		2020*	
	GDP	Vehicle	GDP	Vehicle	GDP	Vehicle	GDP	Vehicle	GDP	Vehicle
Brunei	18,680	399	28,589	457	35,437	592	30,995	736	29,343	963
Cambodia	320	10	471	11	782	19	1,145	30	1,655	39
Indonesia	834	27	1,404	41	3,178	67	3,371	88	3,912	556
Laos	286	8	469	15	1,070	31	1,787	53	2,651	300
Malaysia	4,130	222	5,599	280	8,920	359	9,501	427	10,309	925
Myanmar	159	5	287	5	997	7	1,148	14	1,299	135
Philippines	970	32	1,209	34	2,155	34	2,863	36	3,373	109
Singapore	21,577	139	29,870	144	46,569	157	53,629	147	59,820	170
Thailand	1,912	113	2,906	212	5,065	161	5,799	227	7,582	599
Vietnam	413	7	700	11	1,297	17	2,087	27	3,499	34

Note: ASEAN (2020), ASEAN Key Figures 2020 data are varied from data of FOURIN.

Source: Data from 2001 to 2015 are FOURIN (2017), 9, and 2020 from ASEAN Key Figures 2020.

has an ownership ratio of 556 vehicles per 1,000 people, while Singapore, a city-state where public transportation dominates, is in sixth place in the region with a ratio of 170 vehicles per 1,000 as of 2020.

Motorization has both positive and negative impacts. The positive impacts include greater and faster movement of people and goods, greater and better accessibility, and economic growth. However, there is a lack of infrastructure development in ASEAN countries and the quality of roads in ASEAN countries is inadequate. Poor road quality negatively impacts the useful life of a vehicle and its components. Other negative impacts are traffic congestion that causes delays, environmental effects, accidents, and energy consumption. As a result of rapidly growing motorization, many cities in Asia now face a number of problems, including significant traffic congestion, air pollution from transport sources, and high rates of automobile accidents.

3. Automobile Industry in ASEAN Countries Prior to the Coronavirus Pandemic

ASEAN countries differ greatly in their stages of development, culture, language, demographics, income level, geographic size, social norms, religion, business ethics, technological advances and legal framework (Philip, *et. al.*, 2015, 72). Economic growth has led to rapid expansion in the automobile markets of the ASEAN-5 (Indonesia, Malaysia, the Philippines, Thailand and Vietnam) since the 1980s. In the late 1980s, trade and foreign direct investment (FDI) in the automobile industry have accelerated dramatically in ASEAN countries. As a result, these countries have been motorizing to meet growing demand, producing vehicles on a massive scale.

In the automobile sector, Thailand, which aspires to become the “Detroit of Asia,” has the highest levels of production, sales, and exports among ASEAN countries. The automobile industries in Thailand and Malaysia – two countries

with sizable automobile markets that have pursued different automobile policies and strategies since the early 1980s – have developed in a context of economic globalization and regionalization of the ASEAN auto market. Thailand's automobile policy is oriented toward FDI while Malaysia has pursued a national policy of motor vehicle manufacturing. Indonesia's automobile market is also growing consistently, with automobile sales increasing along with general economic growth. Since 2013, the Indonesian government has adopted a low-cost green car (LCGC) promotion policy (ERIA, Waseda University, 2014).

Automobile companies produce different types of vehicles to meet ASEAN market demand, such as subcompact cars, mini cars, large-sized vehicles, and compact vehicles, as well as light commercial vehicles that are popular in both domestic and export markets. The ASEAN-5 specializes in manufacturing basic components and small cars, with 650 to 1,500 cc vehicles being the most popular. Thailand focuses on passenger cars and pick-up trucks, while Indonesia is making an attempt to specialize in utility vehicles.

FDI of the Japanese automobile industry, consisting of Toyota, Honda and Nissan, are producing vehicles in Thailand to meet regional market needs. Toyota studied local road and traffic conditions, family configurations, affordability, and driving preference, and customized its design to produce the four-wheel drive minivan *Kijang*, which has been the bestselling car in Indonesia for more than 30 years. Toyota also produces pick-up trucks and multi-purpose vehicles to satisfy market demand (Philip, *et. al.*, 2015, 71). The Malaysian government has extended full exemptions for import and excise taxes on hybrid and electric cars for vehicles below 2,000 cc, which has led to a huge growth in sales for hybrid models such as the Honda Insight, Toyota Prius, and Lexus hybrid. In Vietnam, despite facing unfavorable economic conditions the government has implemented a number of policies such as restricting imported cars and restricting private car ownerships. As a result, vehicle sales in Vietnam grew at a compound annual rate of only 1 percent from 2011 to 2018, reaching

117,961 units in 2018, reflecting the uncertainty in the market with respect to the government's unstable automotive-related policies. The production, sales, and export of selected ASEAN countries are discussed in the next section.

3.1 Vehicle Production in ASEAN Countries

Although production volume in the ASEAN-5 countries is still much lower than in many other Asian countries including China, Japan, Korea, and India, the ASEAN region has seen rapid growth in its automobile industry and has been an export base for the world's leading automobile manufacturers since 1998. Two of the ASEAN-5 countries, Thailand and Indonesia, account for 83 percent of gross production, followed by Malaysia, Vietnam, and the Philippines. Automobile production in the ASEAN-5 countries was 815,340 units in 1991 and reached 1.3 million units in 1995, the peak level before the Asian crisis in 1997⁽¹⁾ (FOURIN, 2017, 4). According to the ASEAN Automotive Federation (AAF), vehicle production rose 98 percent to 4.24 million units in 2012 compared to 2.14 million units in 2007. The ASEAN-5 countries produced 4.44 million automobiles in 2013, a growth rate of 4.8 percent compared to the 4.33 million units in 2012, then production decreased to 4.02 million units in 2016 (FOURIN, 2017, 4). At the national level, Thailand produced 2.46 million units and Indonesia produced 1.21 million units in 2013. Among the remaining ASEAN-5 countries, production in Malaysia and the Philippines declined from 2015 to 2019. In 2020, all five countries decreased production due to COVID-19

(1) The beginning of globalization typically refers to the year of 1994 when WTO was founded. In this study, the 1997 financial crisis was used as a cutoff point because of the following considerations: (a) The financial crisis forced various countries to adjust their industrial policies. (b) After the financial crisis, ASEAN countries began to transform their political and economic structures. (c) After the financial crisis, the ASEAN announced the 1999 Hanoi Declaration in declaring that ASEAN countries would intensively integrate the region and accelerate trade liberalization (Wan-Ping, 2016, 38).

(Table 2). In 2019, the region's two biggest car producers, Indonesia and Thailand, posted declines in their annual output consisting of both passenger and commercial vehicles. Compared to 2018, Indonesia's 2019 production declined 4 percent to 1.34 million units, while Thailand experienced a 7 percent drop to 2.01 million units (AAF).

3.2 Vehicles Sales in ASEAN

The ASEAN region has experienced strong economic growth and a growing middle class population, but still has low vehicle density per capita. This represents a large potential market and sales are projected to hit 5 million units annually (Nikkei Asia, 2014). ASEAN was the 6th largest automotive market in the world in 2018, with vehicle sales almost doubling to nearly 4.7 million units compared to 2.4 million in 2011. Vehicle sales in ASEAN-5 countries reached 3.5 million units in 2012, almost double sales in 2007 of 1.9 million units. In 2013, a total of 3.5 million units were sold in ASEAN-5 countries, a two percent increase from the 3.4 million units sold in 2012. Thailand was the largest market with 1.3 million units sold in 2012, but this was a decrease of 7.4 percent on a year-over-year basis, making the country the only ASEAN-5 member to post a decline. Indonesia's LCGC has found economic success in the domestic market. LCGCs are relatively affordable for the country's consumer base, priced at US\$8,265 (Indonesian Rupiah 100 million). LCGC production is regulated by the government, which has a goal of reducing carbon emission from transportation by 26 percent over the five-year period beginning in 2018.

Vehicle sales in Thailand and Indonesia are likely to hit 1 million units by 2013, based on local demand, increased buying power and significant investments from Japanese automobile companies. Passenger vehicle sales in the ASEAN region increased at a compound annual growth rate of 10.2 percent to 3.1 million units in 2018, from 1.5 million units in 2011. Commercial vehicles sales grew at a slightly slower compound annual growth rate of 9.8

Table 2: Trends of Vehicle Production and Sales in ASEAN-5

Country	Category	2000	2005	2010	2015	2019	2020	Variance (%) 2019-2020
Thailand	Production	411,721	1,125,316	1,645,304	1,913,002	2,013,710	1,427,074	-21%
	Sales	262,189	703,432	800,357	799,632	1,007,552	982,146	-29%
	Export	152,836	434,907	895,855	1,204,895	1,240,000	1,300,000	-
Indonesia	Production	292,710	500,710	702,508	1,098,780	1,286,848	690,150	-48%
	Sales	300,964	533,917	764,710	1,013,291	1,030,126	532,027	-46%
	Export	-	17,805	85,796	207,691	240,000	250,000	-
Malaysia	Production	359,195	563,510	567,715	614,664	571,632	485,186	-19%
	Sales	343,173	552,316	605,156	666,674	604,281	522,573	-31%
The Philippines	Production	72,186	58,009	80,477	98,768	95,094	67,297	-40%
	Sales	83,949	97,063	168,490	288,609	369,941	223,793	-29%
Vietnam	Production	7,000	30,000	106,166	171,753	176,203	165,568	-8%
	Sales	19,000	37,191	111,737	209,267	322,322	296,634	-6%

Note: (-) data is not available

Source: FORRIN, (2017), ASEAN Secretarial, several issues

percent to reach 1.6 million units in 2018, versus 780,000 units in 2011 (AAF). The 2011 earthquake and tsunami in Japan and the flooding in Thailand caused automotive production to slow, impacting total vehicle sales. In 2020, sales in all five countries decreased due to COVID-19 (Table 2). The decline in annual vehicles sales in 2020 was largest in the region's two biggest car producers, Indonesia and Thailand.

3.3 Vehicle Exports from ASEAN

Thailand's automotive industry is the ASEAN region's largest and most advanced. Thailand is a major automobile exporting country, producing 2.0 million units in 2018 and exporting more than half of its output to over 100 countries (AAF). It is the ASEAN region's largest automotive market and assembler, and the world's fifth largest pick-up truck market after the United States, Europe, Australia and the Middle East.

Although the Indonesian automotive industry is not as large as Thailand's it is growing steadily. Car sales in Indonesia grew by six percent between 2015 and the end of 2018 – just over 1.3 million units – with 346,000 exported to markets such as the Philippines, Saudi Arabia, and Vietnam, and the government targeted

exports of 400,000 units in 2019. Automobile production in the Philippines and in Vietnam is almost exclusively directed at the domestic market but exports are expected to increase in the future (AAF).

3.4 FDI in ASEAN

The world's leading automobile manufacturers continue to invest in production facilities in emerging markets to reduce production costs and improve profit margins. FDI played an important role in supporting ASEAN countries' economies prior to the COVID-19 pandemic. Table 3 shows that FDI has been increasing in the region, with investments concentrated in Thailand and Indonesia but expanding to Malaysia, the Philippines, Singapore and Vietnam. Regional integration has facilitated sourcing and more efficient intra- and interfirm activities, which has contributed to a better environment for investing in automotive manufacturing activities. FDI has been an important source of growth in some countries, accounting for 8 percent of gross capital formation in the Philippines and 23 percent in Vietnam in 2019, but FDI declined in Indonesia for the period from 2015 through 2019 compared with the previous five-year period (Michael, *et.al.*, 2021).

FDI inflows in the automobile sector come from Japanese companies such as Toyota, Honda, Daihatsu, Nissan, Mitsubishi, Mazda, Isuzu, and Suzuki, as well as from Western manufacturers including GM, Ford, BMW, and Mercedes-Benz, which all have production facilities in Thailand. In Indonesia and the Philippines, Japanese companies have built production bases while Vietnam hosts production by Chinese and Korean companies. A total of US\$47.7 billion, approximately 40 percent of total FDI in ASEAN countries, were from ASEAN's partners including Australia, Canada, China, the EU, India, Japan, New Zealand, South Korea, Russia, and the United States. The largest amount of FDI came from the EU at US\$18.2 billion, followed by Japan with US\$15 billion of investments.

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Table 3: FDI in ASEAN Countries

(US \$ Million)											
Country	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Brunei	625.39	1,208.30	864.81	725.47	568.18	171.32	-150.44	460.15	517.26	374.62	577.43
Cambodia	782.55	891.75	1,557.13	1,274.90	1,726.53	1,700.97	2,475.92	2,788.06	3,212.63	3,663.03	3,624.64
Indonesia	13,770.19	19,241.61	19,137.87	18,443.84	21,810.42	16,642.15	3,920.65	20,579.22	20,563.47	23,883.25	18,581.08
Lao PDR	332.59	466.85	294.38	426.67	913.24	1,079.15	1,075.69	1,695.38	1,358.00	755.52	967.69
Malaysia	9,155.88	12,000.89	9,399.97	12,107.09	10,875.31	10,179.99	11,290.27	9,295.79	7,611.26	7,859.73	3,511.80
Myanmar	2,248.79	2,058.20	1,354.20	2,620.90	946.22	2,824.48	2,989.48	4,002.43	1,609.78	1,729.86	1,907.15
Philippines	1,298.00	1,815.94	2,797.01	3,859.79	5,814.57	5,639.16	8,279.55	10,256.44	9,948.60	8,671.37	6,542.26
Singapore	57,460.60	39,886.60	60,101.90	56,670.90	73,284.50	59,702.30	70,223.50	84,685.10	75,954.10	114,158.40	90,597.70
Thailand	14,746.67	2,473.69	12,899.04	15,935.96	4,975.46	8,927.68	3,486.28	8,285.17	13,190.91	4,816.65	-4,767.86
Viet Nam	8,000.00	7,519.00	8,368.00	8,900.00	9,200.08	11,800.00	12,600.00	14,099.98	15,500.00	16,120.00	15,800.00
Total	108,420.66	87,562.82	116,774.31	120,965.52	130,114.52	118,667.19	116,190.90	156,147.72	149,466.00	182,032.43	137,341.91

Source: ASEAN Secretarial, several issues.

The impact of COVID-19 on FDI flows to ASEAN economies has been particularly noticeable in manufacturing sectors, which account for a large share of FDI. According to OECD (2020a) assumptions, FDI flows likely fell 30 percent in 2020 compared to 2019 but is expected to return to pre-crisis levels by the end of 2021. Trade tensions have increased, with the escalating tariff war between the US and China, resulting in a broader nationalistic spirit in some ASEAN countries. Intensified protectionism, seen in the form of targeted trade barriers, had become a real and present threat to the multinational automobile industry in the ASEAN region. In its trade conflict with the United States, China has initiated more trade with ASEAN countries than with the EU or the United States (ASEAN, 2021), although ASEAN has emerged as a vigorous and growing trading bloc and trade partner for the EU, the United States, Japan, and other regional powers. In addition, ASEAN joined the Regional Comprehensive Economic Partnership (RCEP) in November 2020. Nearly a decade and 31 rounds of negotiations in the making, the RCEP is the world's largest trade deal struck in the 21st century. Involving ASEAN countries, China, Japan, South Korea, Australia, and New Zealand, it is intended to strengthen the region's competitiveness as a manufacturing base and in global trade.

4. The Automobile Industry's Resilience in Recovering from the COVID-19 Pandemic

The COVID-19 pandemic is not the first disaster to abruptly damage industrial sectors. Several natural disasters, such as the 2011 mega-earthquake in Japan, the 2003 SARS outbreak in China, the 2004 tsunami in Indonesia, and the avian and swine influenzas in 2009 led to shortages of parts and finished goods. It is worth noting that production recovered from these disasters in a matter of weeks. However, the impact of COVID-19 is different from those of previous disasters because it has affected the entire world more dramatically than any other local event or disaster since the end of the second world war, has included several waves, and many countries have been placed in lockdowns or semi- lockdowns several times, impacting all sectors of society and the global economy.

Nonetheless, the automobile industry showed resilience during the pandemic and returned to pre-COVID-19 conditions within a short period of time, helped by social distancing requirements, the preference for individual modes of transportation, and stringent public health measures to limit the spread of the COVID-19. However, reduced working hours, temporary redundancies (layoffs), and increased sickness, and isolation have affected the labor supply, while lockdowns and semi-lockdowns have impacted not only the public transport sector, the vehicles market, and many industrial sectors but also overall economies in the regions. As a result, economic growth declined by 13 percent in Thailand, 13.5 percent in Malaysia, 10.3 percent in Indonesia, and 13.6 percent in the Philippines in 2020 (McKinsey, 2020a).

Given these circumstances, governments and the private sector have made efforts to address the crisis. The IMF's World Economic Outlook (2020) estimates that Indonesia, Singapore, Malaysia, Thailand, the Philippines, and Vietnam will achieve record growth during 2021. The IMF also predicted that

Indonesia, Malaysia and Vietnam will return to 2019 GDP levels as early as 2021 but that it will take until 2022 for Singapore, Thailand and the Philippines to do so.

Despite the impacts of COVID-19 on the global economy, ASEAN companies continue to look overseas for investment as a major part of their growth strategies. Prior to the pandemic, FDI growth was mainly driven by strong investment in Singapore, Indonesia, and Vietnam, with these three countries receiving more than 80 percent of inflows in 2019, according to the United Nations Conference on Trade and Development (UNCTAD). Vietnam, recording a 10 percent increase in FDI, received some US\$20 billion of investment. As mentioned above, the governments in ASEAN countries have initiated significant economic policy actions to forestall or cushion the economic consequences of the public health crisis. COVID-19 has also resulted in increased trade protectionism, particularly with regards to essential medical goods and supplies. The eventual impact on FDI flows will depend on the success of both public health and economic policy responses (OECD 2020a, McKinsey 2020a). Given these circumstances, the automobile industry needs to be resilient by encouraging mass material movement and by improving market conditions during and after the pandemic. The ASEAN countries have emphasized several strategies to recover from the impact of COVID-19 and improve sales and the overall condition of their automobiles industries.

4.1 Impact of COVID-19

COVID-19 caused manufacturing activities throughout the world to slow or even stop temporarily, and accompanying changes in demand further worsened economic conditions. The pandemic forced factories to shut down or reduce production of vehicles, as well as automotive parts and components. Deloitte's automobile survey of 2021 ⁽²⁾, notes the following impacts of COVID-19 on vehicles sales.

- (a) Changes to mobility patterns: COVID-19 increased consumers' preferences for personal vehicles. The pre-pandemic average of 37 percent of consumers who preferred to use a personal vehicle increased to 52 percent, due to the desire to avoid COVID infection risk.
- (b) Acceptance of new technologies: Fuel-efficient vehicles are gaining traction among consumers as their first choice for their next vehicle purchase. In the ASEAN region, hybrid electric vehicles (HEVs) are the most popular choice among fuel-efficient vehicle options, with consumers expressing lower preferences for battery electric vehicles (BEVs). Twenty-four percent of consumers would prefer an HEV for their next vehicle, while only six percent would prefer a BEV. On the other hand, 64 percent continue to prefer a car with a traditional internal combustion engine, while another six percent prefer cars powered by other types of fuel (including ethanol, CNG, and hydrogen fuel cell).
- (c) Vehicle financing: As consumers in ASEAN countries do not appear to be willing to pay a premium for electric vehicles (EVs), government support for both manufacturing and sales is likely to be critical in encouraging uptake. On average, about two-thirds or 66 percent consumers expect to pay less than USD 50,000 for an EV.
- (d) Virtual buying processes: Consumers prefer virtual vehicle sales to in-person purchases. An average of roughly 29 percent consumers prefers either a fully or partially virtual buying process.

The COVID-19 pandemic has caused considerable damage to various industries, reducing the availability and supply of raw materials, intermediate goods, and finished products. The direct and indirect impact on the automobile

(2) From September through October 2020, Deloitte surveyed more than 24,000 consumers in 23 countries and regions. The Southeast Asia region, six countries – Indonesia (n=1,017), Malaysia (n=1,013), Philippines (n=1,003), Singapore (n=1,013), Thailand (n=1,041), and Vietnam (n=1,021) – were covered in the study.

industry in terms of supply chains, production, and revenues has been significant, as discussed in the following sections.

4.1.1 Impact on Supply Chains

The automotive industry plays a major role in the ASEAN region, supporting various business services and influencing a vast supply chain. The COVID-19 shock to the supply chain has had a major impact on the automobile industry in terms of the operation of automobile assembly plants, and the suspension of operations at parts plants. As result, the economies of Japan, China and the ASEAN countries weakened, and several automakers in ASEAN region announced a number of extraordinary measures to protect workers. Changes to operations were required, such as the use of hand sanitizer and face masks on production lines. Modernizing the supply chain in response to the pandemic could generate economic growth opportunities in the medium-term and could make countries better able to respond quickly to future crises. This includes the ability to provide face masks and disinfectants, make investments in health clinics, hospitals and infrastructure, and take actions to share technical solutions and combat misinformation.

4.1.2 Impact on Production

Worldwide vehicle production declined by five percent, to less than 92.2 million cars, trucks and buses, in 2020. The automotive industry faced an unprecedented challenge with shutdowns in a large part of the industry, and its suppliers around the world marked 2020 as "the worst crisis ever to impact the automotive industry, a key sector of the world economy" (OICA, 2021). The ASEAN countries' vehicle production fell 32 percent year-over-year, from 4.16 million units in 2019 to 2.8 million 2020 (Table 4). According to the AAF, annual output in the region's two largest vehicle producing countries, Indonesia and Thailand, declined in terms of both passenger and commercial vehicles.

Table 4: Impact on Sales and Production During the COVID Pandemic in Some ASEAN Countries

Countries		Passenger	Commercial	2020	2019	Variance (%)
Indonesia	Sale	388,886	143,141	532,027	1,030,126	-48%
	Production	551,400	138,750	690,150	1,286,848	-46%
Malaysia	Sale	474,104	48,469	522,573	604,281	-14%
	Production	457,755	27,431	485,186	571,632	-15%
Myanmar	Sale	12,867	4,840	17,707	21,916	-19%
	Production	8,346	2,407	10,753	15,496	-31%
Philippines	Sale	69,638	54,155	223,793	369,941	-40%
	Production	37,141	30,156	67,297	95,094	-29%
Thailand	Sale	343,494	448,652	792,146	1,007,552	-21%
	Production	537,633	889,441	1,427,074	2,013,710	-29%
Vietnam	Sale	221,274	75,360	296,634	322,322	-8%
	Production	125,235	40,333	165,568	176,203	-6%
Singapore	Sale	46,986	9,437	56,423	90,429	-38%
Brunei	Sale	12,239	266	12,505	11,909	5%
Total	Sale	1,569,488	884,320	2,453,808	3,458,476	-29%
	Production	1,717,510	1,128,518	2,846,028	4,158,983	-32%

Source: ASEAN Automotive Federation, Website

4.1.3 Impact on Sales

Sales declined as a result of the pandemic for various related reasons. Automobile manufacturing facilities and dealerships around the world were closed for several weeks, and in some cases months. After dealerships reopened, social distancing rules increased barriers to in-person interactions, test drives, and visits to retail showrooms. As a result, consumers confined at home faced increased logistical difficulties in purchasing a vehicle.

The impact of COVID-19 on unemployment is still being felt in the auto industry. Many consumers have been reluctant to buy a new vehicle during this uncertain period as the economic downturn has accelerated job displacement. Job losses affected 878,000 individuals in Malaysia, 4.5 million in the Philippines, 9.2 million in Indonesia, and 2.4 million in Thailand (McKinsey, 2020a), causing auto sales to decline in the region. Table 4 shows that 2020 vehicles sales declined by 48 percent in Indonesia, 40 percent in the Philippines, 38 percent in Singapore, 21 percent in Thailand, 19 percent in Myanmar, 14

percent in Malaysia, and eight percent in Vietnam. Brunei suffered only a five percent decline in auto sales during 2020.

4.2 Resilience in Recovering from the impact of COVID-19

Overcoming the impact of COVID-19 is a challenge. ASEAN's automotive industry has asked for support and governments have responded with financial assistance and other programs to support both production and sales. The automobile industry has shifted to managing the longer-term impact of the crisis. as the region has demonstrated resilience in recovering from the impact of COVID-19, becoming more service-oriented, and more productive through innovation, automation, and workforce reskilling. There are a number of important strategies implemented by the automobile industry and ASEAN countries to increase resilience in recovering from the COVID-19 pandemic as discussed below.

4.2.1 Strengthening Regional Cooperation

Although the ASEAN countries made different policy decisions in response to the pandemic crisis, there has been an increasing convergence with respect to those policies and a strengthening of regional cooperation. Prior to the COVID-19 outbreak, the trade relationship between the United States and China was at a low point. ASEAN has since emerged as a trading partner with the EU, the United States, Japan, and another regional powers, battered by the impacts of Covid-19 yet energized by joining the RCEP in 2020. Through the RCEP negotiations, 15 countries (the ASEAN-10 members, China, Japan, South Korea, Australia, and New Zealand) aim to achieve a modern, comprehensive, high-quality, and mutually beneficial economic partnership (Chowdhury and Khondaker, 2021). The RCEP accounts for 30 percent of the world's population and 29 percent of global GDP. The pact eliminates tariffs and quotas on 65 percent of goods traded within the region, increasing to 90 percent over 20

years. ASEAN industries are poised to benefit from the likelihood that supply chain structures will shift and the region's current strength in key sectors. Based on the region's strength in automobile manufacturing prior to COVID-19, ASEAN is also positioned to grow along with next-generation automotive trends, especially EVs. In the ASEAN market for automobiles outside demand for EVs is projected to reach \$64 billion by 2024 (Michael, *et.al*, 2021). Nissan, Hyundai, General Motors, Ford, BMW, and other major companies are planning extensive production of EVs. In 2020, Chinese automaker Great Wall Motor began production in Thailand. Hyundai, a leading Korean auto manufacturer, began construction of a \$1.5 billion plant to build EVs in Indonesia and began working with LG Chemical on a lithium-ion battery plant in 2020. Hyundai has also invested US\$400 million in a mobility innovation center in Singapore (Michael, *et.al*, 2021).

The COVID-19 pandemic led ASEAN plus three countries (China, South Korea and Japan) to adopt entry restrictions for foreign travelers. In addition, in November 2020 ASEAN Economic Ministers agreed to a memorandum of understanding regarding the Implementation of Non-Tariff Measures on Essential Goods (Agarwal and Gaule, 2021). The agreement focuses on leveraging technology, digital trade, and trade facilitation platforms such as the ASEAN. Single Window, to foster supply chain connectivity and allow businesses to continue operations during the Covid-19 pandemic (OECD, 2020b).

4.2.2 Digitalization and Online Strategies

The ASEAN countries are accelerating digital adoption and e-commerce, and online sales have become an important channel for the auto industry, especially among digitally-savvy consumers during the pandemic. Table 5 shows month-to-month vehicle sales from 2020 to 2021 in the ASEAN countries, and beginning in March 2021 vehicle sales have risen in Thailand, Indonesia,

Malaysia, Singapore, Vietnam, and the Philippines, although Myanmar still has serious challenges to overcome that existed prior to the pandemic.

4.2.3 Tax Incentives

The governments of Thailand and Indonesia have adopted tax incentives to make their countries more attractive for developing automotive production through investment from foreign companies. The Indonesian government will suspend a luxury tax on sales of sedans and two-wheel drive cars with engine capacities of less than 1,500 cubic centimeters from March 2021 to support its automotive industry. The current tax ranges from 10 percent to 30 percent (ASEAN Secretarial).

4.2.4 Technology Strategy

COVID-19 has had a significant impact not only on the automotive industry; most businesses are facing serious challenges. The air travel, tourism, and hospitality industries are facing significant declines in revenue, job losses and insolvencies, and other industries are dealing with factory closures, declining production and demand, and severe supply chain disruptions. Given these circumstances, the automotive industry has no choice but to continue to prepare for a “new normal” rather than getting back to normal, using technological innovation to prepare for the future. Such innovation has been accelerating across the automotive industry. Many EV-producing companies have adopted artificial intelligence, internet of things, and 5G telecommunications to obtain a competitive edge. The automotive industry's ability to embrace the full potential of science and technology is now stronger than ever, showing that a crisis can be turned into an opportunity. Technological innovation is also enabling supply chains, factories, plants, and networks to become more efficient and cheaper to run.

Table 5: Monthly Sale of Vehicles in ASEAN Countries

Country	Month	January	February	March	April	May	YTD May
Indonesia	2021	52,909	49,202	84,915	78,908	54,815	320,749
	2020	80,435	79,644	76,811	7,868	3,551	248,309
	Y-O-Y	-34.2%	-38.2%	10.6%	902.9%	1443.6%	29.2%
Malaysia	2021	32,837	42,784	66,023	57,625	46,663	245,932
	2020	42,942	41,087	21,243	152	23,366	128,790
	Y-O-Y	-23.5%	4.1%	210.8%	37811.2%	99.7%	91.0%
Myanmar	2021	2,555	492	178	268	1,555	5,048
	2020	2,029	2,279	1,997	0	1,282	7,587
	Y-O-Y	25.9%	-78.4%	-91.1%	100.0%	21.3%	-33.5%
Philippines	2021	23,380	26,230	20,702	17,843	22,062	110,217
	2020	23,723	29,790	11,029	133	4,788	69,463
	Y-O-Y	-1.4%	-12.0%	87.7%	13315.8%	360.8%	58.7%
Singapore	2021	6,900	4,770	6,723	5,114	4,508	28,015
	2020	6,203	5,761	6,161	1,048	222	19,395
	Y-O-Y	11.2%	-17.2%	9.1%	388.0%	1930.6%	44.4%
Thailand	2021	55,208	114,168	79,899	58,132	55,948	363,355
	2020	71,688	68,271	60,105	30,109	40,418	270,591
	Y-O-Y	-23.0%	67.2%	32.9%	93.1%	38.4%	34.3%
Vietnam	2021	26,432	13,585	31,227	30,065	25,585	126,894
	2020	15,649	17,536	19,154	11,761	19,081	83,181
	Y-O-Y	68.9%	-22.5%	63.0%	155.6%	34.1%	52.6%
TOTAL	2021	200,221	251,231	289,667	247,955	211,136	1,200,210
	2020	242,669	244,368	196,500	51,071	92,708	827,316
	Y-O-Y	-17.5%	2.8%	47.4%	385.5%	127.7%	45.1%

Source: ASEAN Automotive Federation, Associations (AFAA)Website

4.2.5 Next-Generation Vehicles Strategy

Global environmental concerns encouraged the automobile industry to target sales of energy-efficient vehicles in the ASEAN region. The government of Thailand has announced a plan in 2020 to develop an EV production hub for the ASEAN region by 2025 in that country. Thailand produced 250,000 EV units in 2020, with plans to increase that number to 750,000 units by 2030, or 30 percent of total vehicle output. Although the government's electrification program was suspended due to the pandemic, the National Electric Vehicle Policy Committee resumed its activities in 2020 to re-accelerate the program. In Indonesia, gasoline-powered engine vehicle production has been declining as the country emphasizes the development and promotion of low-cost “green” vehicles, and

Toyota and Hyundai planned to invest in EV production capacity in the region in the long term.

5. Conclusion

The COVID-19 pandemic that began at the end of 2019 has had a devastating impact on the global economy and society in general. Due to the pandemic, the ASEAN's region's GDP declined by 2.5 percent. The Asian Development Bank estimates that ASEAN's growth will be 3.1 percent in 2021 and 5.0 percent in 2022 (with no estimate for Myanmar for 2022) (ADB, 2021). The impact of the COVID-19 pandemic is expected to drastically change income distribution, particularly in developing countries, threatening to reverse pre-pandemic trends and push millions of people back into low income categories. Economic development efforts to curb these potential losses are likely to impact the automobile industry in ASEAN regions, as the automotive industry experienced slow growth in 2019, down more than 10 percent due to supply chain problems (Roland, 2020).

The COVID-19 pandemic has been changing the industrial sector from 'normal' to 'new normal'. Technological innovation in the automobile sector during this period, and lessons learned from the pandemic will pave the way for new ideas and research that could establish a new normal in the automobile industry. In addition, with integrated digitization, growing interest among consumers in next-generation vehicles, especially EVs, work-from-home trends, technology developments and systemic changes to the existing supply chain model will affect the automobile industry in the ASEAN countries as well as the rest of the world.

References

- ADB (2021), *Asian Development Outlook*, April 2021, <https://www.adb.org/publications/asian-development-outlook-2021>, retrieved July 19, 2021.
- Agrawal, Mayank., Eloot, Karel, Mancini, Matteo, Patel, Alpesh. (2020), Industry 4.0: Reimagining manufacturing operations after COVID-19. <https://www.mckinsey.com/business-functions/operations/ourinsights/industry-40-reimagining-manufacturing-operations-after-COVID-19>, retrieved July 19, 2021.
- Agarwal, Ruchir., and Gaulé, Patrick (2021), “What Drives Innovation? Lessons from COVID-19 R&D.” IMF Working Paper No. 2021/048. International Monetary Fund, Washington, DC.
- Allen, Franklin., & Carletti, Elena. (2010). An overview of the crisis: Causes, consequences, and solutions. *International Review of Finance*, 10 (1) , 1-26.
- ASEAN-Japan Centre, (2020), “Global Value Chains in ASEAN: Automobiles” Paper 12, January, https://www.asean.or.jp/ja/wp-content/uploads/sites/2/GVC_Automobiles_Paper-12_January-24-2020-web-edited.pdf, retrieved July 19, 2021.
- ASEAN Secretariat The, *ASEAN Key Figures*, Several Issues, Jakarta, Indonesia. <https://www.aseanstats.org/category/asean-key-figures/>
- ASEAN (2021) “Investing in ASEAN” <https://asean.org/storage/invest-in-asean-2021-2022.pdf>
- ASEAN Automotive Federation, Statistics, 2007 to 2014 (<http://www.asean-autofed.com/statistics.html>).
- ASEAN Federation of Automotive Associations (AFAA), <https://www.asean-autofed.com/>.
- Burn-Murdoch, J. (2021), “Vaccines Are Working: Charts that Show the Covid Endgame.” Financial Times, April 21.
- Chowdhury Mahbulul Alam and Khodaker Mizanur Rahman (2021) “The Regional Comprehensive Economic Partnership (RCEP) in the Asia-Pacific Area and the Role of Japan in Global Trade” *Nanzan Management Review*, Vol. 36. No.1, June.
- Dargay, Jouce, Gately, Dermot (1999) “Income's effect on car and vehicle ownership, worldwide: 1960-2015” *Transportation Research A*” 33: pp.101-138.
- Deloitte (2021) “2021 Deloitte Global Automotive Consumer Study” Southeast Asia perspectives, April, 21, 2021. <https://www2.deloitte.com/content/dam/Deloitte/sg/Documents/consumer-business/sea-cb-global-automotive-study-2021.pdf>, retrieved August 19, 2021.
- Dicken, Peter, (2007), *Global shift: mapping the changing contours of the world economy*, Sage, London.
- ERIA Waseda University, (Economic Research Institute for ASEAN and East Asia and Waseda

- University) Edited, (2014), *Automobile and Auto Components Industries in ASEAN: Current State and Issues*, ERIA Waseda University.
- FOURIN (2017) *ASEAN Jidosha Sangyo*, Japan.
- Heidi Garrett-Peltier, (2017), “Green versus brown: Comparing the employment impacts of energy efficiency, renewable energy, and fossil fuels using an input-output model”, *Economic Modelling*, Volume 61, pp. 439-47.
- IMF (2020) “World Outlook, A long and Difficult Ascent”, <https://www.imf.org/en/Publications/WEO/Issues/2020/09/30/world-economic-outlook-october-2020> retrieved August 19, 2021.
- Ivanov, D. (2020). Predicting the impacts of epidemic outbreaks on global supply chains: A simulation-based analysis on the coronavirus outbreak (COVID-19/SARS-CoV-2) case. *Transportation Research Part E: Logistics and Transportation Review*, 136, 101922.
- JAMA (Japan Automobile Manufacturers Association), (2008) “Hand-in-hand: Partnership in the Auto Industry between ASEAN and Japan” .
- JAMA, (2009), Powering up hand-in-hand: Partnership in the Auto Industry between ASEAN and Japan. Available: http://www.jama-english.jp/asia/publications/pamphlets/hand_in_hand_2009.pdf, retrieved June 19, 2021.
- McKinsey (2020a) “Reimagining emerging ASEAN in the wake of COVID-19” September 2, <https://www.mckinsey.com/featured-insights/asia-pacific/reimagining-emerging-asean-in-the-wake-of-covid-19>, retrieved July 19, 2021.
- McKinsey& Company (2020b) “The impact of COVID-19 on future mobility solutions” , May 2020, https://www.mckinsey.com/~/_media/McKinsey/Industries/Automotive%20and%20Assembly/Our%20Insights/The%20impact%20of%20COVID-19%20on%20future%20mobility%20solutions/The-impact-of-COVID-19-on-future-mobility-solutions-vF.ashx
- Michael Meyer, Michael Tan, Rohit Vohra, Michael AcAdoo and Kar Min Lim (2021) “How ASEAN Can Move Up the Manufacturing Value Chain” June 15, <https://www.bcg.com/publications/2021/asean-manufacturing>, retrieved July 19, 2021.
- Nikkei Asia, (2014) Two nations lead Southeast Asia's motorization, 13 November, <https://asia.nikkei.com/Business/Two-nations-lead-Southeast-Asia-s-motorization>, retrieved July 19, 2021.
- OECD (2020a) “Foreign direct investment flows in the time of COVID-19” , 4 May, <https://www.oecd.org/coronavirus/policy-responses/foreign-direct-investment-flows-in-the-time-of-covid-19-a2fa20c4/> , retrieved June 10, 2021.
- OECD (2020b) “COVID-19 crisis response in ASEAN Member States” <https://www.oecd.org/coronavirus/policy-responses/covid-19-crisis-response-in-asean-member-states-02f828a2/>

- retrieved August 10, 2021.
- OICA (2021) “ Global auto production in 2020 severely hit by COVID-19 crisis with a 16 percent drop in world auto production”, <https://www.oica.net/global-auto-production-in-2020-severely-hit-by-covid-19-crisis-with-a-16-drop-in-world-auto-production/>, retrieved June 10, 2021.
- Paullery, N, Balcombe, R., Mackett, R., Titheridge, H., Preston, J., Wardman, M., Shires, J., and White, P. (2006). The demand for public transport: the effects of fares, quality of service, income and car ownership. *Transport Policy*. 13, (2006) pp.295-306.
- Paul R. Ehrlich, and Anne H. Ehrlich, (2020) “The fallacy of “back to normal” thinking: Anne and Paul Ehrlich”, June 20, 2020, <https://www.ehn.org/covid-19-pandemic-going-back-to-normal--2646261313.html>
- Philip Kotler, Hermawan Kartajaya, Hooi Den Huan, (2015), *Think New ASEAN! Rethinking Marketing Towards ASEAN Economic Community*, Mc Graw Hill Education.
- Radelet, S., & Sachs, J. (1998). The onset of the East Asian financial crisis (No. w 6680). National bureau of economic research.
- Roland Berger (2020) “Three scenarios for how Coronavirus may affect economies and industries” March 12, 2020, <https://www.rolandberger.com/en/Insights/Publications/Three-scenarios-for-how-Coronavirus-may-affect-economies-and-industries.html>, retrieved, June 1, 2021.
- Toyota (2021), “Suzuki, Subaru, Daihatsu, Toyota and Mazda Reach Agreement on Joint Development of Technical Specifications for Next-generation Vehicle Communications Devices”, April, 2021, <https://global.toyota/en/newsroom/corporate/35230385.html>
- Wang, L., & Wells, P. (2020). Automobilities after SARS-CoV-2: A sociotechnical perspective. *Sustainability*, 12 (15), 5978.
- World Economic Forum (2020) “Here’s how innovation could help car companies hit by COVID-19” <https://www.weforum.org/agenda/2020/05/coronavirus-car-manufacturers-innovation/>
- Wan-Ping Tai (2016) “The Political Economy of the Automobile Industry in ASEAN: A Cross-Country Comparison”, *Journal of ASEAN Studies*, Vol. 4, No. 1 (2016), pp. 34-60.

