

The Impacts and Opportunities of COVID-19 Pandemic on China's Automobile Industry

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ABSTRACT

At the start of 2020, the COVID-19 suddenly broke out in Wuhan, China. With the rapid spread of the epidemic, it has comprehensively affecting and changing people's lives. The pandemic has posed impacts on all industries, especially the automobile industry with high industrial correlation. Under the current situation of the overall downturn of the automobile market caused by the downward pressure of the economy, the outbreak of the epidemic is even worse, which will directly affect the automobile industry, including automobile research and development, automobile production, parts supply, domestic sales and export. In order to explore the impacts of COVID-19 on China's automobile industry and the opportunities for its future development, the author analyzed in terms of automobile research and development, automobile production and automobile sales. The study found that while COVID-19 has forced car companies to delay their research and development plans, it has also accelerated research on in-car purification features and driver-less technology. In addition, the epidemic has led to the suspension of automobile production and auto parts shortages in China. China has issued a series of policies to encourage the automobile industry to form a key technological innovation capacity. As for the impact of COVID-19 on automobile sales, the volume of automobile sales in the domestic market, as well as export markets, has declined due to concerns about the epidemic and strict quarantine measures. However, the growing demand for new energy vehicles in Europe during the pandemic has opened up a market for new energy vehicles and battery sales in China.

Keywords: COVID-19, Automobile industry, Automobile research and development, Automobile production, Automobile sales

1. INTRODUCTION

As one of the pillar industries in China, the automobile industry is a symbol industry that can reflect the national economic strength. China's automobile industry has developed rapidly in recent years, and now has become the world's largest automobile production and sales country, as well as one of the world's most important auto parts manufacturing and supply bases. With a huge import and export volume, China plays a pivotal role in the global automobile industry.

Since 2020, COVID-19 has spread around the world. It has caused significant economic and social disruption at an unprecedented and rapid scale[1]. In addition, many industries have been hit hard, especially the automobile industry, which is highly interconnected. Looking back to the SARS period, in just three months, the sales growth rate of the national auto industry

dropped by 23.25% on average compared with the previous year[2]. The auto industry has been hit harder this time by a broader, longer outbreak and stricter government controls. Under the impacts of the epidemic, China's automobile research and development, production, sales and other aspects have been seriously affected. The auto industry is faced with difficulties such as delayed research and development plans, reduced production capacity and suspension of overseas supply of imported parts. But at the same time, the epidemic has also brought a lot of business opportunities to the automobile industry.

One obvious question is how COVID-19 specifically affects and boosts the automotive industry, and whether these will spill over into overall economic and social development. The purpose of the study is to help the automobile industry understand the potential problems and opportunities they will face in a pandemic and how their business will likely change. The author analyzed

and summarized the problems and opportunities brought to automobile research and development process, the current situation of automobile production and the sales status and market of China's automobile enterprises during the COVID-19 pandemic by reading a large number of relevant literature.

2. IMPACTS OF COVID-19 ON AUTOMOBILE RESEARCH AND DEVELOPMENT

2.1. Problems of COVID-19 on Automobile Research and Development

As the epidemic came so suddenly, the original research and development plans of car companies were disrupted and needed to be readjusted. With the improvement of Chinese consumers' requirements for automobile quality and the diversification of the overall demand, China's passenger car market has entered a diversified and personalized development stage. In order to maintain their competitive advantages and meet customer needs, automobile manufacturers are constantly accelerating the speed of automobile replacement. The development cycle of new models has been shortened from about 4 years to 1-3 years, and the development cycle of modified models has been shortened from 6-24 months to 4-15 months[3]. According to the China Association of Automobile Manufacturers, in 2019, a total of 2,881 new car models were registered by Chinese auto brand manufacturers. The speed of vehicle model upgrading and the demand for continuous upgrading after the launch of new cars have been affected by the epidemic.

2.2. Opportunities Brought by COVID-19 to Automobile Research and Development

The epidemic will affect the direction of automobile research and development, and the in-car purification function is favored. The COVID-19 pandemic has posed a significantly huge psychological impact, that makes people realize the importance of safety and health. Technological change is likely to be triggered by a shift in consumer attitudes as a result of the pandemic. It is worth noting that some automobile enterprises have started to add health function configurations to meet the market demand of consumers. For example, Geely Auto focuses on "all-round health vehicles" and launches IAPS intelligent air purification system, while Gac Group mainly focuses on inventing "anti-virus level healthy cockpit". The enterprises enhance cockpit purification by introducing anti-virus level air filtration technology and upgrading internal antibacterial materials[4]. In the long run, the epidemic will lead to a healthy development trend of automobile consumption.

The COVID-19 pandemic has created an opportunity for smart car development. Unmanned cars have become a major concern. During the epidemic, in order to reduce person-to-person contact, many logistics distribution, as well as medicine and food distribution in hospitals, were completed by unmanned vehicles. After the lock down of Wuhan, unmanned mobile terminals began to work, such as unmanned patrol cars, unmanned disinfection robots and so on. The operation of unmanned vehicles can not only effectively avoid the risk of infection caused by contact, but also enable the efficient operation of urban traffic and ensure normal and necessary travel needs. On the logistics side, driver-less cars could move goods from one place to another faster and more efficiently, packaging, dropping or delivering them, reducing the likelihood of a virus spreading[5]. As a result, the epidemic has aided in the development of self-driving technology to some extent. In addition, China will introduce a series of favorable policies to promote the development of the automobile industry and eliminate the negative effect brought by the epidemic. Among them, the development strategy of intelligent vehicles will drive the transformation of China's automobile industry from traditional mechanical products to intelligent products controlled by electronic information systems, so that China's automobile industry will enter the stage of intelligent and networked development.

3. THE IMPACTS OF COVID-19 ON AUTOMOBILE PRODUCTION

3.1. Problems of COVID-19 on Automobile Production

The COVID-19 has limited the production process of domestic cars, resulting in a sharp drop in car production. Wuhan, the center of the COVID-19 outbreak, is not only the largest transportation hub in central China, but also the most important production base of auto parts in China. Many auto companies, including Dongfeng Motor, Dongfeng Honda, DPCA, Dongfeng Renault and other headquarters and production plants, as well as a large number of parts suppliers are rooted here. In order to effectively control the development of the epidemic, most auto production plants across the country stopped production due to the epidemic, causing difficulties in the supply of auto parts across the country[6]. At present, most Chinese auto manufacturers basically implement a zero-inventory strategy that enterprises often establish a long-term and stable cooperative relationship with only one supplier for some key parts. Although the closed supply chain has some advantages in price and cost, it is relatively weak in resisting emergencies. Because once parts can't be supplied on time, it will affect the subsequent production process of the automobile, which leads to a decline in car production. According to the China

Association of Automobile Manufacturers, China's total automobile production figure for 2020 was 25.2 million units. In comparison to 2019, the number of automobiles produced fell by 1.9 percent.

The global automobile supply chain has affected China's automobile industry due to the overseas epidemic. The shortage of spare parts has exacerbated production difficulties for Chinese auto companies.

After years of technological transformation in China's mechanical processing industry, the level of mechanical manufacturing technology has been greatly improved. Although domestic parts manufacturers have been able to independently complete the production of some parts, there is still a big gap with foreign advanced levels in high precision, stability, service life and other aspects. Most of the core components still need to be imported. According to OICA statistics, among the top countries in global auto production and sales in 2019, the United States, Spain, Italy, France, Germany and other countries are seriously affected by the epidemic. This causes great risks to the supply of raw materials and parts for China's domestic and joint-venture automobile industry, which is difficult to replace in the short term. The spread of the epidemic in Europe will have a great impact on the stable supply of gearboxes, body parts and other parts in China's automobile manufacturing, especially gearboxes, which account for nearly 50% of imports (see Table 1).

Table 1 Auto parts import in the first half of 2020

	Import value (US \$100 million)	Import Share (%)
Gearboxes	105.05	41.63
Car body parts	46.67	18.50
Other parts	28.27	11.20
Steering wheels and Steering gears	14.65	5.81
Brakes	12.83	5.08

Source: China Customs Statistics

3.2. Opportunities Brought by COVID-19 to Automobile Production

China should expand and increase opportunities for new industrial chain layout by supporting the development of emerging industries. Facing the development trend of "electrification and intelligence", China hopes to accelerate industrial chain cluster and form a key technological innovation capacity by

stepping up technological innovation and model innovation. The ultimate goal is to promote the transformation and upgrading of the automobile industry, so as to create and lead the new industrial chain layout opportunities[7]. China has listed the new energy vehicle industry as one of the strategic emerging industries, and issued all-round incentive policies. In April 2017, the Ministry of Industry and Information Technology and other ministries issued the "Medium and Long Term Development Plan for the Automobile Industry" forecast: "Automobile output will maintain steady growth, is expected to reach about 35 million in 2025, by 2025, new energy vehicles accounted for more than 20% of the automobile production and sales", the new energy vehicle market has brought a broad market space for automobile enterprises.

4. IMPACTS OF COVID-19 ON AUTOMOBILE SALES

4.1. Problems of COVID-19 on Automobile Sales

4.1.1. The Impacts of the Epidemic on Domestic Sales of China's Automobile Industry

Short term demand for cars has been pent up and sales have fallen sharply. According to the China Association of Automobile Manufacturers, the number of automobiles sold in China in January 2020 was 1.927 million. China witnessed a sharp decline(27.5%) in the number of car sales compared to the previous month. Dealer inventory pressure is large capital chain tension. During the pandemic, consumers reduced travel and avoided indoor activities due to safety concerns, resulting in a sharp decline in the consumption of durable goods such as cars. Although many dealers have launched online marketing activities, the automobile is different from general consumer goods, consumers are relatively cautious when buying cars, and online marketing activities are not attractive to new customers. As a result, automobile sales declined seriously, causing dealers to face great inventory pressure. As shown in Table 2, in the first half of 2020, the sales volume of China's major automobile enterprises declined to varying degrees compared with the same period last year, among which the sales volume of SAIC Group decreased most dramatically by more than 35%. The capital turnover difficulties brought about by the precipitous decline of automobile sales and operating costs make the financial pressure of dealers continue to increase.

Table 2 Automobile sales of China Automobile Group in the first half of 2020

	Sales in the first half of 2019 (volume)	Sales in the first half of 2020 (volume)	Change (%)
Total	9199838	7661161	-16.73
FAW Group	1594464	1630923	+2.3
SAIC	2937296	2049100	-30.24
GAC Group	999560	824600	-17.51
Dongfeng Group	1698100	1400000	-17.6
Changan Group	825200	830992	+1.3
Great Wall Group	493538	395100	-19.95
Geely Group	651680	530446	-19

Source:China Association of Automobile Manufacturers

4.1.2. The Impacts of the Epidemic on the Export of China's Automobile Industry

The epidemic has affected China's exports of automobiles and parts, leading to a decrease in overseas orders and an increase in cancellations. In February 2020, the number of confirmed COVID-19 cases in China continued to increase. Due to concerns over the epidemic, the overseas new orders of automobiles decreased. Exports have also been hit by stringent quarantine measures and the global spread of the virus. Affected by the domestic epidemic, a significant number of countries have taken varying degrees of inspection

and quarantine measures on ships and crew from China and have banned entry of Chinese citizens[8]. Such many control measures have had a negative impact on China's exports. In addition, the spread of COVID-19 around the world has also escalated the epidemic situation in major auto industrial countries, says Germany, South Korea, Japan and the United States. As shown in table 3, China imports more than 70% of auto parts in 2019 from the six countries, which shows that China's import markets are highly concentrated. This is a heavy blow to China's automobile export, because these countries have adopted strict control measures and continued to put restrictions on global trade to prevent the spread of the virus.

Table 3 China's global purchases of imported auto parts in 2019

Countries	Germany	Japan	South Korea	United States	Mexico	Czech
Total imports of auto parts	367.11	102.80	23.44	21.66	15.21	10.36
Proportion of imports	28.0%	26.8%	6.4%	5.9%	4.1%	2.8%

Source:China Customs statistics

4.2. Opportunities Brought by COVID-19 to Automobile Sales

The rapid growth of the European new energy vehicle market during the epidemic provides an important export and investment market for China's vehicles, batteries and other components. There is a large demand gap for new energy vehicle power batteries in Europe, and some high-quality domestic enterprises have entered the supply chain of European automobile enterprises through expanding investment in Europe[9]. According to Mark lines, the demand for power batteries in Europe will increase from 36GWh in 2020 to 200GWh in 2025, with a shortfall of about 18% and 40% in 2023 and 2025. Europe has adopted strict emission laws and regulations to guide the transformation and upgrading of electrification and the

development of the smart and connected vehicle industry, and supported innovation in key technologies such as solid-state power batteries and hydrogen fuel cells, which are weak links.

5. CONCLUSION

As a major public health emergency, COVID-19 has had a profound impact on the automobile industry, an important symbol of China's national economy. This paper summarizes the problems and opportunities brought by COVID-19 to China's automobile industry by analyzing the three aspects of automobile research and development, automobile production and automobile sales.

The study found that the COVID-19 pandemic has delayed car companies' research and development plans,

but pushed forward research into in-car purification functions and unmanned cars. In addition, the epidemic has caused a huge impact on automobile production, mainly reflected in the suspension of domestic production and the shortage of spare parts supply caused by the spread of the epidemic abroad. However, because of the impacts of the automobile production, the state has issued relevant policies to accelerate the formation of technological innovation capacity, and the new energy automobile industry will benefit a lot in the future. As for the impacts of COVID-19 on car sales, car sales in the domestic market declined due to concerns over the epidemic. The export of automobiles has been restricted by quarantine measures in various countries, resulting in a decrease in orders. However, the rapid growth of the European new energy vehicle market during the epidemic has opened up a sales market for new energy vehicle and battery sales in China.

There is no doubt that COVID-19 has posed significant impacts on China's automobile industry. However, if automobile manufacturers can seize the opportunities brought by the epidemic, they will be very likely to recover their output after the epidemic and reduce the impacts of the epidemic.

Although there are important discoveries revealed by the studies, there are also limitations. This paper only analyzed and summarized the impacts and opportunities of COVID-19 on China's automobile industry, but did not give specific suggestions, telling automobile manufacturers what measures to take after the epidemic. Future research can analyze the development prospects of the automotive industry, and provide policy suggestions for automotive enterprises and countries.

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