

The collision of the COVID-19 and the Chinese automotive industry

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Abstract. In the context of the slow or even stagnant development of China's auto industry in the epidemic environment, the specific hazards caused by the epidemic are studied. A survey on the share of auto production by region, auto production, sales trends, and offline events is conducted, and the critical situation faced by the supply chain and offline marketing model is reported. It is proposed that the supply chain should change its previous strategy to increase the resilience of the supply chain against uncertain external factors; that it should shift the focus of the supply chain to the area of core components and enhance the production level of the relevant segments; that it should propose a more automated and modern production process; and that it should transform its primary marketing model from offline to online apps and live promotions. In the face of the impact of the COVID-19 on the market, the automotive industry must establish a more resilient supply chain model and a new sales model to cope with this massive market shift.

Key words: supply chain, online sales, live streaming, automotive industry, auto components.

1. Introduction

The surprise attack of the new crown pneumonia in 2020 nearly paralyzed the interlocking automotive industry chain. Today, domestic and international car companies have suffered varying degrees of blow and loss due to the epidemic's impact on the supply chain and other aspects. The automotive supply chain is facing a major test as the "just-in-time, best-in-stock" parts companies have been dealt a blow. The supply chain of the automotive industry is facing a significant transformation at this time of the epidemic and needs to abandon its previous model and focus in favor of a robust, resilient, and risk-resistant strategic solution; the primary marketing model and the channel through which customers receive information also needs to shift from offline to online. China's automotive industry is vast; for example, in 2021, the total value of the automotive industry in Shanghai will be RMB 758.6 billion, accounting for 17.5% of Shanghai's GDP. The situation of the automotive industry is therefore closely related to the national output. Furthermore, with Tesla's Shanghai factory producing 470,000 units per year in 2021, almost half of its global production, the ups and downs of the auto industry's output have a profound impact on the economic situation in China and the world.

2. Main text section

2.1 Supply Chain

There are three parts of the automotive supply chain to focus on, the demand side, the supply side, and the logistics side. The disruption of the supply chain due to the epidemic and the blockage of international logistics corridors has not only reduced the supply capacity of cars but also led to a sharp drop in consumption capacity and a further reduction in demand for cars in the areas affected by the epidemic. While the intelligent electric era of the automobile has added many new applications of hardware and software, components are essential to the production of vehicles. It is estimated that a typical conventional car consists of approximately 20,000 parts, and high-end cars can have upwards of 30,000 individual parts. Electric vehicle powertrains are changing, and while the mechanical structure is more simplified than fuel power, systems such as intelligent driving, thoughtful networking, and triboelectric control are also being added, increasing the use of many software and

hardware. Furthermore, due to the precision of the car's design, the absence of any one part can lead to the removal of the entire vehicle from the production line.

The epidemic has led to a shortage in the supply of vehicles and their components, which could lead to disruptions in the automotive supply chain in some parts of the world. The supply of automotive parts and production of vehicles has been drastically reduced, and some supplies have even been disrupted due to factors such as the control of road transport in several prominent automotive production areas and the reduced speed of import and export customs clearance, and there may be a risk of disruption in the supply chain of some vehicles around the world. The renowned auto parts group Bosch Group of Germany has already warned of global supply chain disruptions, and Hyundai Motor Group has announced a complete shutdown of its Korean plant due to disruptions in the supply of parts in China[1].

Since March this year, domestic auto production and consumption have been affected simultaneously due to the epidemic, while tightening epidemic controls and poor logistics around the country has become another critical issue limiting production in the auto chain [2]. The main cities on the production side, Jilin and Shanghai, were affected by the epidemic. 2021 saw Shanghai and Jilin rank second and third in vehicle production, with a combined output of 2.25 million units, accounting for 21% of national production. Moreover, Tesla's Shanghai factory will produce 470,000 units per year in 2021, accounting for almost half of its global production [3]. Shanghai and the surrounding area are home to not only well-known Chinese and foreign vehicle manufacturers but also numerous component companies. Core component companies are distributed accordingly in their headquarters locations, so core component companies in Shanghai and other areas have a radiating impact on the industry due to production cuts and shutdowns due to the epidemic. From the beginning to the end of March 22, FAW Group, BMW, SAIC system factories, and Tesla in the whole vehicle have been shutting down production[4]; among the component companies, wiring harness manufacturers such as Ampofo, located in Shanghai, have announced the suspension of production. At the same time, the suspension of production and logistics disruptions in the Yangtze River Delta region also affected the production of cars nationwide and even the supply overseas[5]

On May 6, the China Association of Automobile Manufacturers (CAAM) projected, based on weekly data reported by key enterprises, that in April 2022, the auto industry sales (wholesale sales) were expected to complete 1,171,000 units, down 47.6% sequentially and 48.1% year-on-year; affected by the Shanghai epidemic, SAIC's April production and sales both ended with a significant dip. Among them, SAIC's vehicle production in April was 158,000 units, down 62% year-on-year; vehicle sales were 167,000 units, down 60.3% year-on-year. BYD delivered 106,042 units in April, up 313% year-on-year and 2% sequentially, a rare feat in a headwind, mainly due to BYD's adoption of in-house production of core components and a high level of vertical integration in the supply chain.

The impact of unexpected events of different scales and frequencies on the automotive supply chain cannot be precisely predicted, let alone avoided. However, brands can still adjust their product mix to reduce losses. The automotive industry needs to move away from its traditional supply chain strategy of cost and efficiency optimization and instead focus on increasing supply chain resilience as a core objective. During the past two years of recurring outbreaks in other parts of the world, some foreign companies have taken the lead in transforming their supply chains to make them more resilient and sustainable. In the short term, contingency policies can be used to minimize losses. In the medium term, planning can be undertaken to prevent possible hardship, and in the long term, a new supply chain strategy system can be developed[6].

In addition, companies should actively engage in the upstream core components industry. In order to build a highly resilient supply chain, automotive enterprises can consider changing their original outsourcing strategy and more actively lay out the upstream core components to enhance the level of relevant link capabilities and improve the industry chain's voice. At the same time, more dynamic management of procurement and intervention strategies for each category can be developed. In the case of automotive semiconductors, for example, car companies have long followed the traditional value chain model, which has become dysfunctional in the context of the "lack of core." Different

automotive companies should explore the possibility of participating in the semiconductor value chain, taking into account their business realities, and be more proactive in meeting the challenge of "securing" the supply of automotive semiconductors.

It is also necessary to create more modern and automated production processes.

1. Improve product design to create products that are "easier to manufacture and more suitable for automated manufacturing."

2. opening up a digital thread linking multiple systems to enable multi-dimensional information binding and traceability throughout the production process.

3. deploying a process production and logistics automation system that can switch quickly and adaptively and realize safe real-time interconnection and one-key production change between the equipment and between equipment and information systems to realize the uncrewed operation of the whole process.

2.2 Sales obstacles

In addition, the epidemic has made sales in the automotive and automotive aftermarket more difficult. A large number of car dealers have suspended their operations, and activities such as car shows and promotions have been forced to be postponed. For the passenger car market, consumers will be cautious in choosing public travel modes in the future; several potential consumers of private cars, especially in the central and western regions where household car ownership is relatively low, will see an accelerated short-term release of demand for private cars. At the same time, the low willingness of the population to travel during and for a more extended period after the epidemic will also reduce the demand and supply of net cars and will affect the sales of new energy vehicles mainly to rental and net car customers. The automotive aftermarket, especially auto finance and auto leasing, will also experience varying degrees of decline due to reduced auto sales and lower travel intentions.

Passenger car market retail sales continued to remain low, which was affected by factors such as the epidemic. 2022 April dealership turnover in many areas was affected; there are some brands, about 20% of the dealership shop customer flow disruption of the loss of large, coupled with the loss of some brand models out of supply caused a decline of more than 95%, so April passenger car retail losses[7]. This year, the rhythm of the brands faced an overall adjustment, which was not conducive to the effect of local auto shows, causing certain losses to the promotion link in dealer marketing communications, and the sales environment of conventional fuel vehicles was hampered; while new energy vehicles still relied on streaming media to maintain customer enthusiasm, which was beneficial to the sales of new energy vehicles [8].

In the context of the current epidemic situation, it is increasingly important to get one's brand into consumers' initial opt-in lists through targeted online marketing activities. This is because even if the epidemic subsides, it is likely that the previous standard decision-making process will change: consumers may no longer be inclined to visit multiple brand shops to learn about models actively but will instead turn to online channels. In fact, according to our research, online channels have become the main channel for consumers to actively access information, with non-vertical online channels growing the fastest. As such, automakers should develop a comprehensive online touchpoint strategy to optimize the effective reach of information to end customers significantly.

In addition, given the epidemic's impact on the overall product launch cycle (from marketing to production), automakers need to explore more flexible and agile launch methods and consider forms such as live online launch events in addition to traditional auto shows. For example, a Shanghai-based car company completed the launch of its high-end intelligent electric car in the form of an online launch event during the epidemic closure. As the online launch did not have the limitations of an offline venue, the car company effectively communicated its product positioning with a focus on handling through a pre-recorded racing video[9]. Of course, even with an online launch, car companies still need to consider issues such as venue, on-site staff, and vehicle scheduling, the difficulty of which should not be underestimated in a fully controlled situation; however, preparing multiple sets of model launches may be a move that car companies should consider for some time to come.

Sales and service end: Given the unique product attributes of cars, test drives and other links are indispensable. Although car marketing and new car delivery cannot be 100% contactless, the multichannel model is still an effective means of dealing with the epidemic[10].

On the one hand, through channels such as live streaming and expanding the functionality of the official app, car companies were able to maintain uninterrupted sales and service during the epidemic. For example, an up-and-coming car brand ensured that the new car experience and communication campaign ran properly through the UGC content in its highly engaged official APP.

On the other hand, by the multichannel and especially the direct connection model, some car companies were able to grasp and interact with their customer touch-points directly. At the same time, long-term brand loyalty was created through snowy customer care during the epidemic. For example, during the epidemic, the Shanghai-based sales and service team of a new car manufacturer maintained close communication with customers located in Shanghai and dropped off supplies for those in need of help, significantly enhancing customer satisfaction, public support for the brand and brand loyalty of a group of customers.

3. Conclusion

In response to the impact of the pneumonia epidemic on the automotive industry, it is necessary for automotive and its components enterprises to build and improve the new retail model of automobiles and enhance the stability of their production and sales models. The epidemic has exposed the shortcomings of the physical auto distribution system. Automotive enterprises should actively participate in the new retail model of auto e-commerce platforms and integrated e-commerce platforms that integrate technologies such as big data, virtual reality, and artificial intelligence to improve the existing distribution system of physical 4S shops.

Domestic automotive and parts enterprises should always maintain a sense of crisis, continuously improve the competitiveness of their own supply chains, enhance their stickiness to the upstream and downstream of the industry chain and reduce the risk of being replaced by automotive manufacturing and parts suppliers in Southeast Asia, Mexico and other regions through initiatives such as strengthening R&D cooperation with upstream and downstream enterprises, sharing demand forecast information and cooperative inventory management or seller-managed inventory.

The global automotive industry chain may face major layout adjustments in the coming period, and the auto sales model may also be reshaped at an accelerated pace. The proportion and position of China's auto industry in the global auto manufacturing supply chain may be affected to a certain extent, but this is also a new opportunity for China's auto industry to transform and upgrade and enhance its competitiveness. Every major crisis in history has often been accompanied by accelerated upgrading and management innovation; the best companies will eventually emerge, and the industrial structure of China's automotive industry will be further adjusted and optimized.

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