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Rescuing the global automotive industry supply chain

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Abstract: China's economy has been deeply integrated into the global industrial supply chain, and the global industrial chain is highly dependent. The automobile industry is an important pillar industry of the national economy. It plays an important role in the development of the national economy and society because of its wide industrial chain, strong correlation, wide employment and large consumption. This paper studies the value chain of the global automobile industry. By analyzing the current situation of China's automobile industry, the degree of dependence on global foreign trade, and the position and advantages and disadvantages in the global value chain, it puts forward the development trend and direction of the future automobile industry chain, which has certain reference significance for the development of the automobile industry.

Keywords: Value chain; Automobile industry; Foreign trade dependence.

1. Overview of global automobile industry value chain

The United Nations Industrial Development Organization defines the global value chain as a global production activity. The production chain covers the production of goods and services. The global value chain can be interpreted as a transnational production network connecting regional production, processing, sales, recycling and other links. The automobile industry has a large investment density and high technology content, which is a typical producer driven value chain. Before the 1980s, the automobile industry was only a national industry. The automobile enterprises implemented vertical integration, and each link from design, procurement to production and sales was completed independently within the company. In the 1990s, automobile enterprises began to transcend the boundaries of countries and regions, organize production globally, establish a global value chain dominated by transnational corporations, and outsourcing and OEM became the main production organization forms. Since this century, the automobile global value chain has shown the characteristics of global distribution and regional concentration in spatial structure. Vehicle manufacturers and parts are concentrated in North America, Europe and Asia, forming three monopoly patterns.

2. Analysis of the Current Situation of China's Automobile Industry

For 11 consecutive years, China's total auto production and sales volume has ranked first in the world, accounting for more than 30% of the world's total auto production and sales volume. China, the United States, Japan, Germany and India are among the top countries in the global auto production and sales volume. In 2019, there were 34 automobile and auto parts enterprises in the world, ranking within the top 500 in the world. There were 6 enterprises in China on the list, which were respectively the holding enterprise groups of five major countries (SAIC, Dongfeng, FAW, BAIC and GAC) and one private enterprise, Zhejiang Geely. The number of key vehicle enterprises was only second to Japan, higher than the United States, and the number of vehicles and economic benefits were in the top three.

However, the development of China's auto parts enterprises is relatively weak. China's automobile industry is limited by the late start of the industry, weak foundation and other reasons. There are still bottlenecks in basic parts, basic materials, technology, equipment and other fields. Some or all of them rely on foreign capital or joint ventures. The automobile industry is large but not strong, and the core competitiveness of the industry is insufficient. For example, traditional automobile automatic transmissions, automotive electronics, etc., independent products are generally 5-8 years behind similar foreign products. None of the 11 auto parts enterprises among the world's top 500 enterprises are Chinese enterprises.

3. Analysis on the Position of China's Automobile Industry under the Global Value Chain

3.1. Relatively concentrated dependence on foreign trade of automobile industry

1). Import. In terms of finished vehicles, in 2018, China imported 1.135 million finished vehicles with an import amount of US $50.51 billion. However, the importing countries are concentrated, including Japan (29%), Germany (25%), the United States (18%), the United Kingdom (9%), Slovakia (5%), etc. In terms of spare parts, the top countries of origin of auto parts are Germany (28%), Japan (26%), South Korea (9%) and the United States (7%). The imported products of spare parts are mainly rotating systems, body accessories, engine parts, etc.

2). Export. In terms of finished vehicles, China exported 1.009 million finished vehicles in 2018, with an export amount of 15.10 billion US dollars. Countries of export transactions mainly include Iran (19%), Mexico (11%), Chile (7%), the United States (7%), Egypt (4%), etc. In terms of spare parts, the United States is China's largest market for spare parts exports. In 2018, the export volume of auto parts reached 53.31 billion US dollars, accounting for 31% of exports to the United States. The export products of spare parts are mainly automobile driving system and braking system.

At present, although China's automobile industry only participates in the middle and low end of the global value chain, it is undeniable that the taxation, employment, output value, etc. of the automobile industry have made great contributions to China's economy. With the constant acceleration of economic globalization and scientific and technological progress, the automobile industry tends to be more integrated, intelligent, networked and other characteristics. The domestic stable economic and political environment, as well as the larger market demand, will help maintain the stability of China's automobile industry chain. Domestic independent brand automobile enterprises and parts enterprises should seize the current opportunity of automobile industry transformation to help China become a world automobile power.

3.2. A big gap in the value chain of China's automobile industry

From the proportion of exports of joint ventures and independent brands in domestic sales, the proportion of exports of joint ventures in domestic sales is far lower than that of independent brands. In terms of parts and components, China's foreign-funded (sole proprietorship/joint venture) parts and components enterprises account for about 1/5 of the number of large-scale enterprises, but their market share has reached more than 70%, especially in the high-tech fields related to automotive electronics and engines. The market share of foreign-funded enterprises has even reached 90%. It can be seen that the main purpose of transnational automobile companies entering China's market is not simply vertical division of labor, but to seize China's domestic automobile market.

3.3. Transnational automobile and parts enterprises seize the domestic market, hindering the value-added development of China's automobile industry chain

Through the monopoly and control of China's automobile sales channels, transnational automobile enterprises have achieved the goal of seizing China's domestic automobile market, which has led to the reduction of automobile exports, hindered the cross-sea extension of China's automobile value chain, and led to the division of the automobile industry chain. Since Volkswagen entered China in 1984 to establish the first joint venture, China has opened up its auto industry to the outside world. Especially since joining the WTO, many companies have established joint ventures in China, and the scale has gradually expanded. Chinese local enterprises (such as FAW, SAIC, Dongfeng, etc.) have closely cooperated with many foreign enterprises. Joint ventures account for most of China's auto market, and only a few local auto manufacturers, Moreover, the business scale is relatively small. Taking cars as an example, the market share of autonomous vehicles is only 20%, while the market share of German, Japanese and other joint ventures is 80%.

The global value chain of China's automobile industry, compared with the automobile powers, has a significant gap. The domestic sales and export volume of China's automobiles are not coordinated, and the industrial value chain has not been fully extended overseas. Although China's automobile production and sales are far ahead of the world, becoming the "largest production factory", the proportion of China's automobile exports in domestic sales is low. In 2018, China's automobile exports accounted for only 4.33% of domestic sales. In terms of market distribution, China's overseas market also accounts for a lower proportion than that of powerful automobile countries. South Korea and Germany pay more attention to the development of foreign markets. Japan takes into account both domestic and foreign markets. The overseas market of the United States also accounts for a higher proportion than that of China.

4. Prediction of the trend of the automobile industry value chain

4.1. The global integration pattern of the automobile industry chain

With the rapid development of the process of economic globalization, the upstream and downstream of the automobile industry chain, including investment, research and development, procurement, production, sales and after-sales service, are also increasingly globalized. Due to the globalization of the consumer market, vehicle manufacturers also have a strong driving force to enter the global markets through sole proprietorship, joint venture and other means, accelerating the merger and reorganization of automobile related enterprises, breaking the original supporting system, thus driving the global layout of the industrial chain. At present, the industrial chains of various regions compete and cooperate with each other to form a flow configuration of global capital and means of production relying on the automobile industry, which blurs the "national characteristics" of automobile products and makes them a typical global product.

4.2. Internet development and intelligence drive the expansion of automobile industry chain

With the continuous development and progress of scientific and technological life, many new industrial chain structures have emerged. Many industries that were not highly related to the automobile industry or were new have joined the industrial chain, promoting the continuous expansion of the automobile industry chain. At the same time, with the rapid development of the Internet, the automobile industry model has also been redefined, and new technologies such as artificial intelligence have been applied. New energy vehicles, intelligent connected vehicles, and driverless vehicles will become the new trend of the development of the automobile industry chain in the future, which will also drive more industries to integrate into the automobile industry chain and promote the continuous expansion of the automobile industry chain.

4.3. There will be no major migration changes in the automotive industry chain in the short term

In the past two years, the escalating trade frictions between China and the United States and the unilateral protectionism promoted by the United States have brought uncertainty to the development and layout of the global automotive industry chain. Relevant people also worry about the possibility that the automotive industry supply chain may be transferred to other developing economies, such as India. Especially at the initial stage of the outbreak of the domestic COVID-19, the risk of replacement of parts suppliers, withdrawal or transfer

of the industrial chain was increased due to production obstruction, supply interruption of the industrial chain, difficulty in auto marketing, etc. However, with the rapid and effective control of the domestic epidemic, the huge bearing capacity of the auto market, and the steady and positive development trend of the domestic macroeconomic fundamentals, multinational auto enterprises' enthusiasm for investment in China continued. China's mature automobile industry chain, service supporting system and supporting capacity are still highly competitive. It is predicted that the automobile industry chain will remain stable in the short term and there will be no major transfer. Therefore, domestic self-owned brand automobile enterprises and parts enterprises should seize the opportunity to do a good job in the transformation and development of electrification, intelligence, networking and sharing, so as to help China become a world automobile power.

5. The development of automotive supply chain in Shanghai

Shanghai is not only an important city of China's automobile industry, but also a core gathering area of the global automobile industry. It has not only SAIC Group, Tesla and other world-famous automobile enterprises, but also the headquarters of many global automobile parts multinational enterprises in China. The report of China Automotive Technology Research Center shows that among the key core parts enterprises in the automotive industry, the engine enterprises in the Yangtze River Delta account for 47%, the transmission and power battery enterprises account for 53% and 56.65% respectively, and the battery control system enterprises account for more than 70%. According to incomplete statistics, there are more than 600 auto parts enterprises above designated size in Shanghai. If small and micro auto parts enterprises are added, there are more than 20000 auto parts enterprises. To some extent, Shanghai is a "barometer" of the development of the domestic automobile industry, and its importance is self-evident. Once the supply chain of Shanghai auto industry is under operational pressure, the risk spillover of auto parts system will not only affect the surrounding areas of Shanghai, but also have a great impact on the national auto industry.

In April this year, the COVID-19 in Shanghai opened a fragile corner of the Shanghai auto industry chain, and also caused the industry to think about rebuilding the supply chain of the industry chain. The normal operation of the automobile industry depends on the joint efforts of the upstream and downstream industrial chains. The problems exposed in Shanghai's automobile industry and supply chain security under the epidemic situation reflect the difficulties of Shanghai's automobile supply chain. The industry chain is relatively long, and the upstream and downstream are linked. One is blocked, and the whole chain needs dynamic adjustment.

In fact, since the beginning of 2020, the safety of the domestic automobile supply chain has continued to experience tests. In addition to the epidemic, a series of problems, such as the shortage of automobile chips and the rise in the price of automobile raw materials, have prompted automobile enterprises to focus more on ensuring the supply chain. In the face of these problems, how should the Shanghai automobile industry face, how should the industrial supply chain adapt, and how should the organizational structure change? Under the heavy pressure, the practices of Shanghai automobile industry are as follows.

First, implement the national strategic deployment and focus on stabilizing the industrial chain supply chain. Shanghai regards automobile as one of the key industries of the "3+6" new industrial system, and strives to improve the resilience of the industrial chain. It has arranged 8 vehicle enterprises and more than 600 domestic and foreign major parts enterprises. From January to October this year, Shanghai achieved a production of 2.4 million vehicles, an increase of 11% year on year, including 770000 new energy vehicles, an increase of 66% year on year, providing strong support for the steady growth of Shanghai's industry. Facing the new opportunities of automobile industry reform, Shanghai further strengthens the layout of the whole industrial chain, cultivates intelligent new models such as Zhiji and Feifan, tackles the key problems of automobile core chips, on-board operating systems and other industrial chain weaknesses, and speeds up the construction of a high-end, emerging, intelligent and open modern automobile industry system.

The second is to promote industrial transformation and upgrading, and strive to build the momentum of development advantage. Shanghai regards the development of new energy intelligent connected vehicles and fuel cell vehicles as an important starting point to win the initiative of future development. At present, 900000 new energy vehicles have been promoted, ranking the first in the world; A total of 926 1800km test roads for ICVs have been opened, and 458 ICVs road test and demonstration application licenses have been issued to 27 enterprises. The road mileage, number of test enterprises and number of licenses rank first in China. On November 7, Shanghai just issued the first batch of commercial operation licenses at the Expo and took the lead in opening two expressways in Jiading District. Facing the future, Shanghai will speed up the layout of smart terminals and new green low-carbon racetracks, implement six major actions, including the creation of consumer terminals and the acceleration of the landing of commercial terminals, promote local legislation on smart connected vehicles, pilot the access of smart connected vehicles, and carry out the demonstration application of fuel cell vehicles. By 2025, the annual output of Shanghai ICV will reach 2 million, and the output value will exceed 500 billion yuan.

Third, improve the automotive industry ecology and strive to promote win-win cooperation between all parties. Focusing on accelerating the construction of a world-class automobile industry center, Shanghai has focused on strengthening the four functions of high-end manufacturing, well-known headquarters, cutting-edge innovation, and communication and display, and has gathered more than 150000 high-end talents in automobile, accounting for 22% of the country; 620000 charging piles have been built, 15 national and more than 100 municipal public service platforms and technology centers have been built, and the service capabilities of new energy vehicle big data platforms, power battery traceability platforms, charging facility management platforms, etc. have been continuously improved. At the same time, Shanghai has cooperated with relevant cities to build a "1+6" Shanghai city cluster for fuel cell vehicle demonstration applications, and established the New Energy Vehicle Industry Alliance in the Yangtze River Delta. Shanghai auto industry will fully implement the strategic deployment of a manufacturing power and a transportation power, accelerate the construction of a first-class business environment, promote cooperation

and coordination among all parties, make every effort to build an auto industry cluster with the largest industrial scale, the best ecological environment, and the strongest overall competitiveness, and continue to lead the high-quality development of Shanghai auto industry.

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