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Theoretical Exploration of High-quality Development of China's Automobile Industry in the New Era

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***Abstract*—China is the largest automobile production and marketing market in the world. The development of automobile industry is directly related to the overall level of national economy and the social welfare level of the people. High-quality development is the goal and requirement of automobile industry transformation, and also the theoretical basis to guide the current automobile industry out of the predicament. Against the background of the new normal economy, what are the connotation, characteristics and driving mechanism of the high-quality development of the automobile industry? By discussing and answering these basic questions, this paper tries to ascertain the theoretical basis for the high-quality development of automobile industry.**

Keywords—automobile industry; high-quality development; theory

I. INTRODUCTION

China's automobile sales have declined for the first time in nearly 30 years due to the combined effects of external trade environment, technological innovation and changing demand structure. For example, Chongqing, a major industrial city in southwestern China, is the largest automobile production base in China. The automobile manufacturing industry supports Chongqing's economic growth to lead the whole country. However, in 2017, Chongqing's automobile industry experienced negative growth for the first time and seriously slowed down Chongqing's industrial growth, which led to the lowest GDP growth rate in Chongqing in 21 years in 2018 under its direct jurisdiction. At present, a new round of scientific and technological revolution and industrial transformation are flourishing, and the world industrial competition pattern and development trend are being adjusted in depth. To accelerate the transformation and upgrading of industrial structure, including automobile industry, and promote the transformation of growth impetus on the basis and experience of 40 years of reform and opening-up, is an important topic of the times faced by the current industrial development, and is also an important aspect of the new era in order to meet people's ever-increasing diversified and personalized needs for a better life.

II. THE THEORETICAL CONNOTATION OF HIGH-QUALITY DEVELOPMENT OF AUTOMOBILE INDUSTRY

In the new era, the development of automobile industry is facing new characteristics such as technological revolution, industrial transformation and development mode transformation. Xi Jinping, the General Secretary, pointed out that the essence of the change of economic growth from high-speed growth to medium-high-speed growth is that the mode of economic development has changed from scale-speed mode to quality-efficiency mode. Entering the new stage of development, China's development impetus should be transformed from extensive types, such as external demand, resource promotion, and input-driven, policy-driven, to intensive development and innovation-driven endogenous impetus. Economic structural adjustment should be transformed from incremental expansion to stock adjustment and optimal increment. At the same time, it can form an innovative engine for the development, and lead high-quality development with innovative economy. Under the guidance of the concept of innovation, coordination, green, open and sharing, the direction of high-quality development of automobile industry in the new era should be adjusted dynamically with the change of people's needs for a better life.

A. Innovation and Development

Marx's idea of innovation appeared in his exposition of production tools. The essence of production tools is the strongest driving force for the scientific and technological revolution [1]. In the new era, the development of automobile industry is facing new characteristics such as technological revolution, industrial transformation and development mode transformation. Digitalization, networking and intelligent manufacturing will be the manifestation of the revolution in the automotive industry in the new era. "Internet +" and "Car +" promote the creation and transmission of value gradually. Institutional innovation can promote the formation of the endogenous foundation and sustained impetus of innovation-driven development of the automobile industry.

B. Coordinated Development

Marx's exposition of coordinated development mainly lies in his theory of resource allocation and department

structure balance. For the automobile industry, coordinated development is a process of coordinated development and win-win cooperation. It mainly includes management synergy, innovation synergy, industry synergy, intelligent network automobile synergy, business synergy, the "inclusive synergy" among Chinese and foreign joint ventures, the endowment synergy between traditional automobile enterprises and "new forces of automobile manufacturing" and so on.

C. Green Development

In Marx's view, nature is not only the object of labor but also the means of labor for human beings. While China's economic development has made remarkable achievements, it has also paid environmental costs. Some studies have pointed out that about 70% - 80% of all air pollutants over the city come from automobile exhaust [2]. Adhering to the green direction of high-quality development of automobile industry economy, we must run through the green concept in development, make full use of green technology, and vigorously develop green economy and ecological economy. We should develop new green-oriented technologies, promote new applications of green technologies, and promote comprehensive and coordinated green development from production to consumption at the levels of system, policy and organization.

D. Open Development

We should adhere to open development and solve the problem of internal and external linkages. We must attach importance to the construction of "the Belt and Road", adhere to open development, further expand the scope and level of opening up, improve the open structure layout and institutional mechanism, and actively respond to the changes in the external environment. We should focus on the innovation of management mode, the changes of transaction relationship and distribution mechanism adjustment of the automobile industry from the perspective of the development of the global automotive industry chain, so as to promote the production mode and industrial form of the automobile industry. Then, it will promote high-quality development with the high-quality opening up.

E. Coordinated Development

We should adhere to coordinated development and solve the coordination problems of various links, such as cars at various levels, the proportion of new cars to used cars, and the layout of production in different regions. Sticking to coordinated development, we should also pay attention to the efficient coordination among different regions. At present, many provinces and municipalities regard automobile industry as a pillar industry. The factor flow between provinces and municipalities is not smooth, resulting in overproduction and waste of resources. It should form strategic resource sharing and complementarity, reduce R&D funds, manpower and time costs, and optimize product structure through sharing and cooperation of vehicle platforms, power systems and new technologies, so as to enhance product competitiveness of both sides.

III. FUNCTIONAL LEVEL OF HIGH-QUALITY DEVELOPMENT OF AUTOMOBILE INDUSTRY

A. Upgrading of the Industrial Chain

First, production links move forward. Industry chain is the whole process of forming creative products and services through production and operation activities. This process includes front-end links (R&D, design, innovation), middle-end links (raw material production and procurement, core parts manufacturing, product manufacturing, assembly) and back-end links (logistics, sales, and post-sale service), etc. [3]. For automobile manufacturing enterprises, the transformation and upgrading of automobile industry chain means that the production should be extended to the core of the industry chain by strengthening the virtual simulation design and manufacturing, specifically from raw material production, low-end product manufacturing and assembly, to front-end research and development, design, manufacturing of key components, and to logistics, sales and other core links.

Second, it should control the whole industrial chain. The whole industry chain is production and operation link from industrial production to consumer service. With the promotion of the revolution of information industry, automobiles have gradually changed from simple means of transportation to large mobile intelligent terminals, and digital space, digital and intelligent technology provide the basis of opening up the whole industry chain of automobile research and development, manufacturing, service and life cycle.

B. The Transformation and Upgrading of Value Chain

First, it can increase value by increasing quantity. The model is more extensive, usually not considering or less considering the contribution of factors, the scientific distribution of various value chain links and wealth distribution links, more attention is paid to the total value of automobile manufacturing enterprises and other enterprises through automobile manufacturing and sales.

Second, improving quality means to increase added value. In front-end production links such as design and R&D, knowledge and technology contribute more to added value, while in manufacturing and processing links, labor contributes more to added value, and the added value produced by unit input in different production links is also different. Increasing the added value of industry will bring about a real increase in national wealth.

C. Upgrading the Innovation Chain

Compared with the industrial chain, innovation chain belongs to the innovation mode in the industrial chain, such as innovative research and development and design of new products, the use of new materials, attentive methods, processes, etc. in the production process. The above contents can exist independently or simultaneously. In 1913, Henry Ford, the founder of Ford Motor Company, pioneered the world's first automobile assembly line at Highland Park Complete Vehicle Works in the United States, simplified the

assembly process of T-type vehicles, greatly improved work efficiency, and simplified the process of 3,000 assembly parts to 84 processes. The whole process innovation involves new products, new materials, new production methods, new processes, and new sales and so on. It promotes the formation of new products, new services and new formats by using basic, strategic and frontier technologies, which are mainly the middle-end and low-end links of the industrial chain.

D. Enhancing TFP (Total Factor Productivity)

TFP (total factor productivity) is on the rise in most countries, and the contribution of technology, management and knowledge to global economic development is gradually increasing. In the global automotive production enterprises, the high-end production factors of enterprises in the United States, Europe, Japan and other countries are constantly improving, occupying the key core technology links in the global industrial chain, and maintaining long-term competitiveness. R&D is the most basic and key factor for enterprises to maintain a leading position and realize subversive technology development. It is also the most basic and key factor for industries to improve their core competitiveness and realize industrial transformation and upgrading.

E. Promoting the Brand

Brand promotion is an important way of industrial transformation and upgrading. Consumers regard a specific commodity of an enterprise as the psychological awareness of a certain category of commodity. The higher the psychological awareness is, the higher "the brand category degree" will be. "The brand category degree" is related to the monopoly ability of the enterprise. The stronger the market monopoly ability of the enterprise is, the higher the brand category degree will be, and vice versa. Examples of higher band category include the passenger cars of Volkswagen, General Motors, Ford Motor, Toyota and Honda Company. Implementing brand strategy objectively requires government departments to simplify administrative procedures delegate powers to lower levels. The market plays a decisive role in economic development and resource allocation, and creates a good living environment for enterprises. It also requires intellectual property protection departments to really strengthen the protection of intellectual property rights, respect the original's labor, and provide protection for innovation.

F. Industrial Standards

Industrial standards are composed of a series of industrial standards. Industrial standards refer to the recognized and unified standards of a certain industry within a certain geographical scope (nationwide or global scope). China's industrial standards are approved and issued by the competent government departments, which are uniformly used within the scope of this department. Industrial standards can be divided into safety standards, quality standards, health standards, environmental protection standards, technical standards and so on.

Industrial standards can prevent substandard enterprises from entering related industries, eliminate some substandard enterprises, and promote enterprises to take measures to meet industry standards. The most important role of industrial standards in industrial transformation and upgrading is to promote most enterprises of the industry to improve their technical level, product quality, production management, energy saving and emission reduction measures to meet the requirements of industrial standards. The above measures can help the transformation and upgrading of industrial chain and value chain, so as to promote industrial transformation and upgrading.

IV. Driving Forces for High-quality Development of Automobile Industry

A. Government Power

For reasons of economic growth, employment promotion and industrial protection, there are more or less government shadows in the transformation and upgrading of industries in developed and developing countries. Industrial developed countries such as the United States and Germany have formulated various industrial policies to protect and support the development of their important industries. In the fierce international competition, the governments of developing countries often adopt the methods of resource allocation to catch up with and surpass certain industries. After the 2008 financial crisis, the U.S. government introduced "AIFP" and "Advanced Technology Vehicle Manufacturing (ATVM) projects" to promote industrial upgrading, so as to prevent the bankruptcy of the automotive industry and promote the energy efficiency of the automotive industry. Government intervention or support for industrial upgrading has appeared in the industrial development of various countries, especially in the development of manufacturing industry, and market mechanism has become a decisive factor in the success or failure of the government's role. However, due to the difficulties of government intervention in resisting the improvement of various systems and unclear function orientation, the government of the United States, Germany and other developed countries will stop intervention in supporting industrial upgrading when the enterprises have the ability to enter the market, so as ensure the vitality and competitiveness of industries or enterprises through the elimination of the fittest in the market competition. The government has focused more attention on increasing investment in public facilities construction and basic scientific research. The government can build industrial parks, encourage the same industries to enter the same park, and make the enterprises in the park form economies of scale and knowledge spillover effects. At the same time, the government can implement preferential policies such as tax reduction and exemption for enterprises that take the initiative to adopt new equipment and research and development, and encourage enterprises to make the transformation and upgrading. It has provided financial guarantee for industrial transformation and upgrading. Industries cannot afford the cost of industrial transformation only by their own strength, and a single bank cannot afford the financial support of industrial transformation. The

government can play a better role in providing stable financial deepening support to realize the financialization of industrial transformation.

B. Market Power

The market can automatically discover backward industries through demand, price and other mechanisms, and promote the transformation and upgrading of backward industries. Industries with successful transformation and upgrading can survive in the market, while industries with unsuccessful transformation and upgrading are eliminated. Deep understanding of market demand is of positive significance to industrial transformation and upgrading. Exploiting new markets and finding new demand is conducive to the digestion of excess capacity and reducing the cost of enterprise transformation and upgrading. Social demand is the "vane" of industrial transformation and upgrading. By knowing the frontier of social demand, we can grasp the direction of industrial transformation and upgrading.

V. CONCLUSION

The high-quality development of the automotive industry needs to be guided by the five development concepts, attaching importance to the upgrading of the industrial chain, value chain and innovation chain, and improving the total factor productivity, brand and industry standards. It will be necessary to pay attention to the role of the two major players in the market and the government in the development of the automotive industry.

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