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Is There a Segmentation inside Global Value Chain of the Automobile Industry in China?

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Abstract

Since German Volkswagen accessed to Chinese market in building a joint venture in the mid-1980s, the automobile industry in China has been engaged in global value chain (GVC) activities for more than three decades. China went through three stages of start-up, large-scale expansion and overseas M&A, and very quickly established a comprehensive manufacturing system, remaining the world's first place after 2009 in terms of output and sales. However, in line with the rapid expansion of production scale, automobile industry in China, due to the lack of some value-added links in the global value chain of automobiles, has failed to form a closed-loop reflux pattern in the GVC of automobile industry, resulting in a significant segmentation phenomenon. It mainly manifested in: 1) In the production process, there is the break between the upstream design and key parts against the mass local vehicle manufacturing, and the high-added value chain links are held by foreign operators. 2) In the sales process, there exists a fault zone between large-scale sales of vehicles and very few export volumes. And the value chain of automobile industry in China has not been effectively extended to overseas market. This paper further investigates main reasons behind the segmentation of the automobile industry value chain in China: 1) the business strategy of multinational automobile companies aim to seize of China's local automobile market, which blocks the overseas extension of the value chain; 2) The control of domestic automobile sales channels by the foreign stake in JVs leads to the monopoly of supply chain and post-market of automobile industry, which indirectly leads to the segmentation of value chain. 3) Low value acquisition mode of independent brand automobile enterprises is isolated in the high value-added link of global value chain, which leads to the segmentation of value chain directly. 4) Some of the industrial and trade policies lead to the abnormal high price in automobile market and the difficulty of extending the overseas value chain. Furthermore, this paper puts forward the research prospect of whether the value chain segmentation of automobile industry in China exists for a long time,

and the alike problem of value chain segmentation. The new energy vehicles will confront.

Keywords

Automobile Industry in China, Market Entity, Value Chain Segmentation

1. Introduction

After the reform and opening-up for 40 years, the automotive industry in China has experienced an upgrading process from total importing, CKD/SKD assembly, technology introduction and production replacement to the present stage (Liu, 2002). According to the International Organization of Motor Vehicle Manufacturers (OICA), the auto production in China and sales in 2018 reached more than 27 million. It becomes the world's first for 10 consecutive years for its huge production capacity and sales. Currently, production of Mercedes-Benz in Beijing is 16 times higher than it was planned a decade ago, making it the world's largest production base. And China's manufacturing capacity exceeds all of earliest expectations (Cai, 2019). China Association of Automobile Manufacturers (CAAM) revealed that average annual production and sales of automobiles in China are more than 22 million, a stable growth during the years from 2009 to 2018. In terms of imports and exports, China imported an average of 105,870 vehicles and exported 854,400 vehicles per year. There existed a clear quantitative gap. More obviously, the trade deficit in value amounted to $32,213 million. The average annual vehicle exports account for only about 3.8% of total sales. In terms of auto parts, the average annual import volume is US$31.707 billion and export volume is US$54.643 billion. And the trade surplus is US$22.936 billion. The structure of import and export products of auto parts is unreasonable-key components with high technical content and high value-added are mostly imported, and products with large resource consumption and low value-added are mainly exported, such as driving systems (Zhuang et al., 2013).

China's automotive industry has increased its overall size by participating in the division of global value chains mainly in a manner of joint ventures. But it also exposes the irrationality of its value chain structure. Firstly, both in terms of production and sales, the production and manufacture of the whole vehicle are huge in volume. But its export volume is extremely low. Over the past 10 years, the total vehicle trade deficit has been $322.130 billion, equivalent to 2.8 times the total auto exports. Secondly, as an important part of vehicle manufacturing, key components of auto parts have to rely on imports to achieve. Obviously, the design and key components manufacturing links in upstream are stuck in developed countries, and sales links in downstream are controlled as well.

However, this phenomenon is quite different from the normal form of GVC. The Industrial Development Report 2002/2003 (UNIDO, 2003) elaborated the

form of GVC that GVC is based on the factor endowment advantages of participating countries, and leads enterprises to vertically divide and configure the production process on a global scale, thereby realizing the flow of goods among consumers. This means that commodity circulation is also globally achieved. GVC should be a closed-loop return pattern of "in and out". Normally, a country uses inputs from imported intermediate products to achieve the output of the final product or other intermediate products. In addition, Hummels et al. (2001) have clearly defined the meaning of vertical specialization division of labor, arguing that vertical specialization occurs only when a country uses imported intermediate products to produce and export final products. From the development course of the automobile industry in the past two decades, the cross-merger of automobile giants and the emergence of a large number of overseas production bases have further deepened the vertical specialization of the modern automobile industry. Therefore, in the division of GVC of automobile industry, a country to participate in the GVC activity process at least export links must cross national boundaries. In contrast, sales link in GVC of automobile industry in China is almost all sold to the domestic. There is a huge domestic production system and international export market there is a huge gap. Consequently, China's automobile industry to participate in the GVC division of labor due to the lack of some value-added links in the value chain led to the formation of closed-loop backflow pattern, resulting in a clear fragmentation phenomenon.

2. Literature Review

Historically, the worldwide automobile industry is hard to be separated from the deepening of the division of labor. However, the formation of GVC of automobile industry in China and its composition is unique. Necessary research word need be further explored in reference to the related studies as follows.

2.1. The Composition of the GVC of Automotive Industry

The concept of value chain was first proposed by Michael Porter (1997), and then developed by Kogut (1985), Gereffi & Kaplinsky (2001) and others, in terms of the value chain scope, activities and other aspects of continuous enrichment, formed a more complete theoretical system and research framework for GVC. Companies involved in GVC engage in value-added activities ranging from design, product development, manufacturing, marketing, sale, consumption, after-sales service, and final recycling. These activities create different values, and only a few activities create higher value.

GVC of automobile industry in China carry out the layout of global production activities, which is mainly around the industrial chain. It involves investment, production, procurement, sales and after-sales service, research and development and other links (Liu & Feng, 2002). And it finally formed to car manufacturing as the core, vehicle design and development key component design in upstream, and manufacturing, vehicle sales in downstream and automotive af-

ter-sales service of the automotive industry GVC construction model (Zhou & Yu, 2007). Among them, the value distribution of the value chain of the automobile industry is the lowest value created by the whole vehicle manufacturing process, while other production activities are surrounding the vehicle manufacturing, and the value of the creation is increasing (Yu & Hu, 2012). However, these studies have not edited the correlation between the value division mode and the result of different market subjects in the vertical division of labor system and the different market subjects in various links in China's automobile industry.

2.2. The Mode of Multinational Auto Companies Enter into Chinese Market

Sun et al. summarized two ways of entry profit function based on the perspective of product difference, through the construction of export and direct investment. It is concluded that the high-end products of multinational companies mostly choose the export way to enter overseas markets, while the low-end products choose the way of direct investment into China (Sun & Wang, 2011). Since China's automobile industry participated in the global division of labor, the technical level has been improved, but the development quality and competitiveness is far away from those developed countries. Sun & Chen (2005) found that there is unreasonable industrial structure in GVC of China's automobile industry. Besides, the value chain activities scattered, and the value chain specialization is insufficient, inefficient. The value chain is abnormal, concentrated in the whole vehicle assembling, neglecting the key parts industry. Independent research and development capabilities and the industry supporting service system is so far imperfect (Zheng, 2007). Li et al. (2018) used Koopman's status index and Fally's length index to analyze the status of China's automobile industry in GVC, and indicated that The GVC index of China's automobile industry has increased the foreign length of GVC, and the degree of integration of the global division of labor is not adequate. Furthermore, Zhuang et al. (2013) from all aspects of the value chain, the establishment of China's automotive industry international competitiveness evaluation index system. The study found that China's automobile industry is still locked in the lower end of the value chain.

To further explain this new concept in new energy automobile industry, Zhang et al. (2009) put forward the idea of implementing the strategy of the electric vehicle in operating value chain by comparing the management model of value chain in different enterprise. Yan & Wang (2010) discussed the composition and breakthrough of China's new energy automobile industry value chain from the perspective of resources.

For the study of China's automobile industry value chain, scholars are more inclined to GVC application in the automobile industry, and some studies mention the problems of disjointed value chain, weak parts link and insufficient specialization, but do not discuss the consequences for automobile industry. Some scholars measure GVC length from the perspective of value-added, mention that the length of foreign value chain is much smaller than the length of domestic

value chain, but do not analyze the causes of this phenomenon in depth, nor analyze the difference of value chain length at home and abroad is one of the manifestations of value chain separation. Few studies mentioned whether there is a segmentation of GVC in the automobile industry.

This paper analyzes the current situation of China's automobile industry participating in GVC division, verifies the existence of the separation phenomenon in global value chain, and further explores the fundamental reasons for the division of GVC in China's automobile industry from the value links such as value production, sales and post-automotive market, and further put forward the four models of value chain upgrading of China's auto industry.

3. Three Forms of Global Value Chain Segmentation in China's Automotive Industry

3.1. The Segmentation of the Value Chain between the Acquisition of Key Components and the Manufacture of Vehicles

In view of GVC of automobile industry in China, there is an incongruity inside the upstream R&D and design, key component manufacturing and the manufacture of Chinese vehicle production size. With the deepening of the international division of labor, multinational auto companies in China have invested in production bases, followed by corresponding supporting parts manufacturers. About 70% of China's auto parts market is occupied by these manufacturers via mergers & acquisitions and other expansions, while China is mainly engaged in the processing and assembly of basic components.

With China's vehicle manufacturing approaching an annual output of 30 million vehicles, China's auto parts import market is also on an ongoing upward trend, averaging more than $30 billion a year (see the left axis of **Figure 1**). Exports have been rising to more than $60 billion and account for more than 70% of China's auto exports in recent years.

From the auto parts trade structure (see **Table 1**), the import and export surplus of parts mainly concentrated in the driving system, the deficit mainly concentrated in the transmission system. Among them, the exported components are mostly low value-added, labor-intensive, resource-consuming driving systems, electrical and electronic appliances, vehicle body and its accessories, engine parts, which account for more than 70%. And most of them serve the aftermarket. China imports high tech content and value-added engines, transmission systems and other key components mainly from Japan, Germany, South Korea. In the GVC activities of auto industry in China, key components are dominated by foreign countries, and low value-added basic components are used as a cheap foundry. For the value chain of automotive industry, vehicle manufacturing is at the core, but the key components required for vehicle manufacturing are controlled abroad. And there is a huge separation between large-scale vehicle manufacturing and key components.

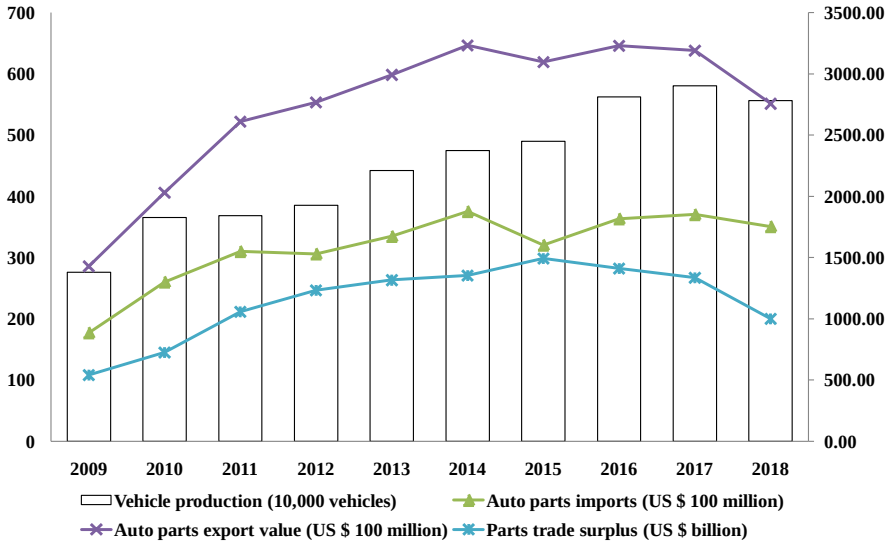


Figure 1. Import, export and vehicle manufacturing of Chinese auto parts.

Table 1. Trade volume of import and export based on structure of spare parts.

Automotive Parts Type	Exports (US$ billion)			Imports (US$ billion)			Trade surplus (US$ billion)		
	2015	2016	2017	2015	2016	2017	2015	2016	2017
Engine whole	17.83	18.22	20.41	18.62	20.20	19.94	−0.79	−1.98	0.47
Body and its accessories	87.09	92.72	97.82	73.12	73.76	73.39	13.97	18.96	24.43
Transmission system	36.17	33.16	36.42	114.57	132.12	143.94	−78.40	−98.96	−107.52
Driving system	201.54	190.82	211.64	16.58	19.83	17.98	184.96	170.99	193.66
Brake system	47.72	47.23	50.19	9.34	12.25	10.86	38.38	34.98	39.33
Steering system	17.40	18.13	19.67	18.73	16.53	17.62	−1.33	1.60	2.05
Electrical appliances	109.61	103.73	95.45	25.53	35.90	32.52	84.08	67.83	62.93
Engine components	72.25	72.60	77.46	42.79	42.26	45.81	29.46	30.34	31.65

Source: Yearbook of China's automotive industry.

3.2. The Segmentation of the Value Chain between Domestic Vehicle Sales and Export Volume

In the GVC sales link of China's automobile industry, there is an incongruity between the domestic sales and export volume of large-scale vehicles. And its value chain failed to extend overseas. With the continuous refinement of the industrial division of labor, China's automotive industry to participate in the international vertical specialization division of labor continues to deepen, The other side of the fact is that automobile production and sales of China is far ahead of the world's first as the "largest production plant" (Yang & Li, 2018). China's auto production and sales volume increased from about 13.79 million units in 2009 to near 30 million units in 2017, with an average annual growth rate of 180%.

However, in terms of vehicle exports, China's car exports have been less than 6% of domestic sales each year for the past 10 years, and exports are minimal. Since 2011, China has imported more than 1 million vehicles for eight consecu-

tive years to meet domestic auto demand, while exports have exceeded 1 million units in 2012, 2017 and 2018 respectively (see the left axis of Figure 2). From the proportion of vehicle exports to domestic sales, the overall show of highs and lows, the average proportion of about 3.8% (see Figure 2), large-scale domestic sales of vehicles and very few export volumes there appears a clear segmentation.

3.3. Two Segmentation Bands in the Global Value Chain of Automotive Industry in China

In general, compared with the powerful automobile countries, there are significant differences in the GVC form of China's automobile industry. Powerful automobile countries show an outstanding performance in brand awareness, technology leadership, value chain length and value-added and export ratio. Table 2 shows that the market distribution gap between China and the auto motive powers is large. Germany and South Korea pay more attention to foreign market development. And the export volume of these two countries in the past two years accounted for 62.02% and 53.58% of the total sales, respectively. While Japan takes into account domestic and foreign markets. The proportion of its exports in the past two years in total sales is 47.55%. And the United States is more focused on the domestic market. The proportion of its exports in the past two years in total sales is 14.82%. Overall, the proportion of auto exports of automobile powers is higher than China's, which is only about 4%, less than 1/4 of the United States.

Figure 3(a) and Figure 3(b) depict the market distribution and value chain streams. Due to the difference in value acquisition in the GVC link, the value chain model of automotive industry in China and powerful automobile countries is different, the former stays in a one-way line (see Figure 3(a)), the latter is

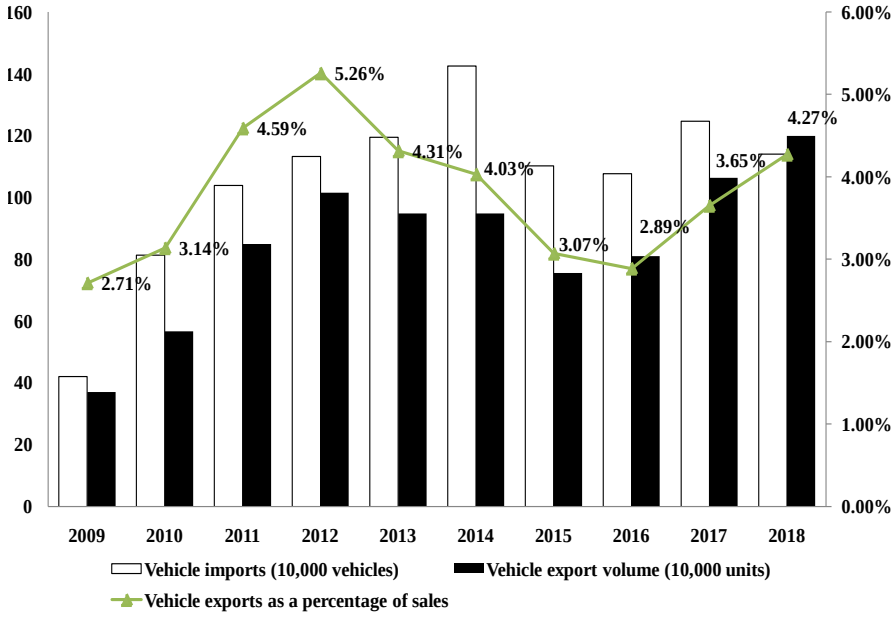
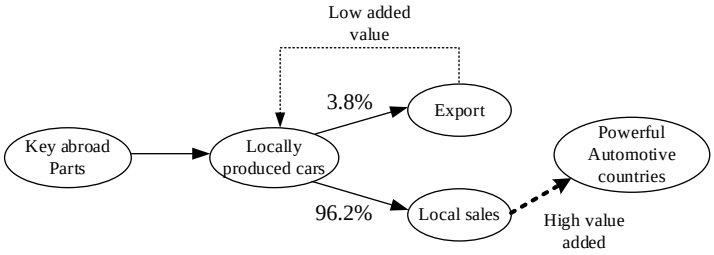
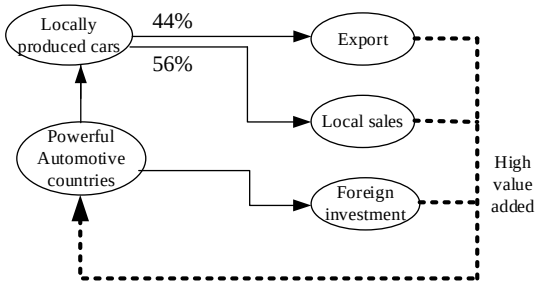


Figure 2. China's auto imports and exports account for proportion of domestic sales. Source: Yearbook of China's Automotive Industry.



（a）Automotive Industry Global Value Chain in China- (One-Way Line)



（b）Automotive Industry Global Value Chain in Germany, United States and Other Powerful Countries-(Closed-loop Model)

Figure 3. Global Value Chain differences in the automotive industry between China and automotive powerhouses. Source: Yearbook of China's Automotive Industry.

Table 2. Export volume accounts for the proportion of domestic sales in latest years in powerful automobile countries (10,000 units).

Countries	2017			2018		
	Domestic sales	Exports	Exports as a proportion of domestic sales	Domestic sales	Exports	Exports as a proportion of domestic sales
Japan	523.42	470.58	89.91	527.21	481.75	91.38
Korea	156.02	263.24	168.72	155.23	244.97	157.80
Germany	381.1	437.35	114.76	343.6	399.05	116.14
United States	1758.38	303.75	17.27	1727.4	302.57	17.52
China	2912.25	106.38	3.65	2808.06	121.6	4.33

of closed-loop type (see **Figure 3(b)**). The GVC model of China's automotive industry and acquisition of value is one-way. Even though China exports 3.8% of the total vehicle sales, gaining a small amount of value added. But relative to the automotive power in 96.2% of the total vehicle sales to obtain the value-added, it is very few (**Figure 3(a)** in the fine dotted line part). The pattern of value chain and value-added acquisition in powerful automobile countries such as Germany and the United States is closed-loop, with domestically produced cars sold and exported locally, while foreign investment in joint ventures with China, but all products or capital flows allow them to gain high value-added gains (in **Figure 3(b)**, the dotted line part).

4. The Main Reasons of Segmentation of the Global Value Chain of Automotive Industry in China

4.1. Joint Venture Business Strategy Blocks the Overseas Extension of the Value Chain

Through the monopoly and control over China's automobile sales channels, multinational automobile companies achieve their goal of preempting China's domestic automobile market, which leads to fewer vehicle exports, blocking the overseas extension of China's automotive value chain, and causing it to split.

Since Volkswagen entered China in 1984 to set up its first joint venture in Shanghai, Chinese government has been opening up to the outside world in the automotive industry. Especially after China's accession to the WTO, a large number of companies have entered China to set up joint ventures, and the local scale is expanding. Under industrial policy, local Chinese companies (such as FAW, SAIC, Dongfeng, etc.) work closely with a number of foreign companies, with joint ventures taking r most of China's car market shares, and only a few native local carmakers run business in a smaller size (see Figure 4).

Over the past 10 years, the lowest sales of joint ventures were more than 10 million vehicles, and the highest sales of local independent brand enterprises in 2018 were only more than 4 million units. However, the proportion of joint venture exports to domestic sales is less than 1/8 of the corresponding ratio of independent native enterprises, and its export volume performance is far less than that of local independent brands. It can be seen that the multinational auto companies entering the Chinese market, its main purpose is not simply vertical division of labor, but to seize the Chinese domestic auto markets. Thus they did not continue to export the vehicles, extending value-added activities overseas. The business strategy directly led to the obvious segmentation between China's domestic sales and export volume of the industry (Table 3).

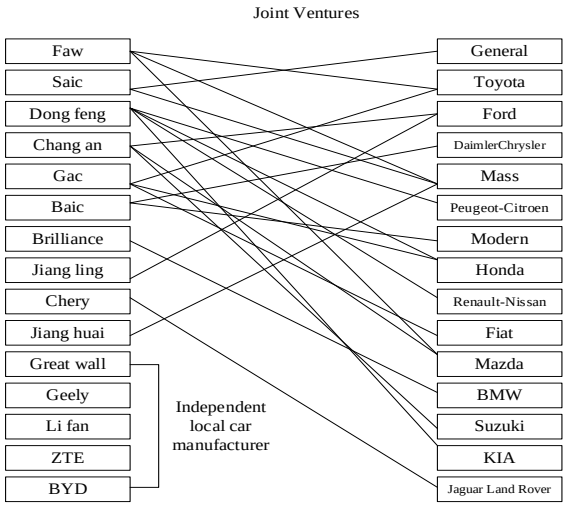


Figure 4. The joint venture structure of China's automotive industry. Source: Yearbook of China's automotive industry.

Table 3. The sales of Chinese automobile vehicles by enterprise (10,000 units)[1].

Year	Self-owned brand enterprises			Joint Ventures			Average import price (US$10,000 /vehicle)	Average Export price (US$10,000 /vehicle)
	Exports	Domestic sales	Exports as a proportion of domestic sales	Exports	Domestic sales	Exports as a proportion of domestic sales		
2009	14.82	162.61	9.12%	11.94	1026.72	1.16%	3.68	1.40
2010	24.57	216.18	11.37%	17.58	1343.43	1.31%	3.79	1.23
2011	42.41	219.01	19.36%	24.85	1390.12	1.79%	4.17	1.29
2012	57.08	231.73	24.63%	33.62	1454.55	2.31%	4.21	1.35
2013	51.86	259.53	19.98%	28.14	1683.52	1.67%	4.10	1.36
2014	44.22	248.33	17.81%	26.92	1859.33	1.45%	4.27	1.46
2015	34.53	285.86	12.08%	23.34	1914.84	1.22%	4.09	1.65
2016	30.60	334.66	9.14%	26.88	2141.33	1.26%	4.13	1.41
2017	31.33	379.38	8.26%	39.78	2176.86	1.83%	4.09	1.32
2018	28.80	409.18	7.04%	54.98	2094.44	2.62%	4.46	1.22

Source: Yearbook of China's automotive industry.

In order to seize more automobile market shares in China and maintain their competitive advantage, further enhancing their own strength, the multinational companies dominate the GVC, imposing a technical blockade on localization of automobile industry. Therefore, its joint global suppliers of global parts monopoly in China build a wall against high-value-added link of high-value-added, which forms a certain technical barriers to the domestic auto suppliers. This has led to a lack of key component technology from domestic automotive suppliers, failing to produce high-end cars that are internationally recognized and rival to foreign brands. On the other hand, forcing domestic vehicle manufacturers to import key auto parts from abroad, which in turn exacerbates the lack of key components and large-scale vehicle manufacturing mismatch.

In addition, China's vehicle sales channels are still brand licensing single channel-based, and controlled by foreign invested companies. Car sales and after-sales service as a whole, after-sales service mainly includes parts replacement and other content. Due to controlled sales channel, foreign capital in the existing monopoly profits continue to monopolize in the automobile market. Meanwhile, the replacement of supporting parts is often provided by brands, parts involved in the supply chain are once again monopolized by foreign investors. This monopoly allows the distributor to raise the price of imported cars indirectly while raising high prices of cars produced by joint ventures in China. The inflated price of auto-

[1]Note: Due to the availability of data, this paper is based on the China Association of Automobile Manufacturers to give the top ten enterprises in China's vehicle export volume. And their export volume (of which the top 10 enterprises accounted for 70% of the total export volume of the calendar year and above, sales accounted for 87% of the total sales volume of the calendar year and above), select the top 10 enterprises to study, the data is representative.

mobile makes local enterprises satisfied with the excess profits at home, no impetus to seek foreign markets and the extension of the value chain.

4.2. The Self-Branded Automobile Enterprises Lead to the Segmentation of the Value Chain

The value acquisition method of independent brand automobile enterprises relying on low-tech content and low value-added production also leads to the segmentation of GVC in the automobile industry.

Figure 4 shows that the main entities of China's auto market are currently the largest domestic enterprises and foreign-funded enterprises to set up joint ventures, mainly producing international brand cars. The entry of these multinational car companies often choose China's own industrial base of auto groups, such as FAW, SAIC and other groups to carry out joint ventures, so as to absorb them into its leading GVC production system. The expansion of this model has made these local automakers more dependent on foreign companies, lacking knowledge of product development and complex production management, and often producing old foreign designs under their own brands (Oliver, 2013). Further, due to technology, capacity, market and other restrictions, the rise of China's automotive industry value chain is long-term locked in the low-end link.

In order to seek a breakthrough in the domestic automobile industry, some enterprises, especially independent brand of automotive enterprises, have begun to develop and innovate their own technology, and gradually create their own brands. But the domestic market for these fully self-branded cars faces a collective squeeze on joint-venture brands. To this end, self-branded cars rely on exports to Asia and Africa to increase brand value. However, its export unit price is about $13,000 in average, while the import price of automobiles is about three times higher than the export price. As a result, the value of export vehicles is much lower than imported cars. Due to low-end lock-in, comparing to foreign enterprises, independent brand auto enterprises have low-tech level, which more engage in low-value-added old vehicle design, production, manufacturing process. The way to obtain key components need to rely on foreign companies, and the value of unit vehicles is much lower than imported cars. Self-branded cars have a small number, low visibility and value, and insufficient advantages in the domestic automotive market currently. It is isolated in the vehicle research and development design, key parts manufacturing, sales and other high value-added links, in this low-end link of the reprocessing and assembly. In short, two kinds of segmentation that China's automotive industry GVC confront in forms of the quite small domestic sales and export volume of the vehicle and, the key parts relying on foreign companies.

4.3. Distortions from Industrial and Trade Policies

The rapid growth of the automobile industry and the large-scale entry of foreign capital are related to China's automobile industry and trade policies. Before China's accession to the WTO in 2002, China protected the traditional domestic

automobile market by imposing high tariffs and implementing trade barriers such as quota management and investment control. After that, although China has been reducing tariff barriers, the traditional automobile industry investment restrictions and product catalog control still remained, which indirectly building a barrier to new entrants, prompting the domestic automobile integration market and the international market to further split. At first, the derailment presented in the shape design, production model lag, and finally relatively cured the abnormal price system (Table 4).

In summary, gradually reducing tariffs, relaxing limits on capital stake, rising investment thresholds actually generate some problems for the development of the automotive market. Multinational automobile companies still hold the technical blockade in the vehicle research and development design, key component

Table 4. The evolution of China's automotive industry policy and trade policy.

Policy	Policy paper	Year	Policy adjustments
Automotive Industry Policy	The Law on Sino-foreign Joint Ventures	1979	Foreign investment ratio must not be less than 25%.
	Automotive Industry Policy	1994	Import quotas and import licensing system; The proportion of foreign equity shall not be higher than 50%; Foreign investors may not build more than two joint ventures in China to produce similar vehicle products; Foreign investment shall not enter the field of China's automobile services; Product localization rate has clear requirements.
	Automotive Industry Development Policy	2004	Remove the share ratio limit for foreign-invested engines; Elimination of the localization policy requirements.
	Special Measures for Foreign Investment Access (Negative List)	2018	Foreign-funded enterprises producing special vehicles and new energy vehicles to remove the restriction of foreign share ratio; Foreign investors in China can build two and less joint ventures to produce similar vehicle products; To eliminate the limit on foreign share stake in commercial vehicle manufacturing by 2020; To abolish the limit on foreign share ratio in passenger car manufacturing in 2022; In 2022, we will lift the limit on the number of similar passenger car products that foreign companies set up joint ventures in China.
	Regulations on investment regulations for the automobile industry	2018	Prohibit new independent fuel vehicle enterprises; Improving the project conditions for new pure electric vehicle enterprises.
Automotive Trade Policy	Automotive Trade Policy	2005	To abolish the quota system for automobile imports; Adopt an automatic import licensing management system; The total distribution and sales system for automobiles adopting brand authorization.
	Import and Export Tax Rules of the People's Republic of China	2006	The average import tariff on vehicles has dropped to 25%; Import duties on spare parts are reduced to 10% on average.
	Measures for the Administration of Car Sales	2017	Breaking the single system of brand licensing and encouraging parallel imports; The licensing period of the brand is extended to 3 years.
	Most-favored-nation tax rate adjustment table for imported cars and parts	2018	Some vehicle tariffs have fallen to 15%; Tariffs on some parts fell to 6%.

technology and other core areas. Due to the technology learning and experience accumulation, China obtained local adaptive design and elimination of production technology learning. These did not only make a breakthrough in the core technology of the automobile industry, but also make the companies more dependent on foreign-invested enterprises, which deepened the difficult situation of independent innovation in China's auto industry, making market distortion in the auto parts supply chain. In addition, the continuous revision of the management of automobile sales has not changed the current situation of market price distortions in automobiles. Car sales from a single brand licensing mode to diversification, but brand licensing-based sales channels and prices are still monopolized by foreign investors. For example, SAIC-GM was fined ¥201 million for monopolizing the price of its cars in 2016 (Shanghai Municipal Development & Reform Commission, 2016). Comparing to local auto companies with relatively immature technology and low brand awareness, multinational automobile companies establish the brand master dealer model by virtue of brand, technology, marketing and other advantages, so as to control and falsely raise the price of China's entire automobile, which resulting in abnormally high price of China's domestic automobiles. The long-time cycle of these distortions has led to high monopolistic profits in China, difficulties in extending overseas value chains and deepening the rift in GVC of auto industry in China.

5. Conclusion and Research Prospects

Firstly, there are two segmentations in China's automotive industry. They exist in the asymmetry between domestic sales and export volume of vehicles, and the asymmetry between the acquisition of key components and the scale of vehicle manufacturing. Among them, the scale of domestic vehicle manufacturing is expanding, but needed high value-added key components in the vehicle manufacturing are monopolized by foreign countries. The state should step up efforts to control the quality of vehicle exports and encourage high-quality exports.

Secondly, the reasons for the segmentation of GVC in China's automobile industry lie in the interaction between the strategy of foreign multinational automobile companies, the trade policy of the domestic automobile industry and the way of acquiring the value of local enterprises. Automotive industry and trade policies lead to distortion of local automobile market prices, leaving overseas value chain difficult to extend. Joint ventures seize China's domestic automotive market directly blocks the overseas extension of the automotive industry value chain. The control of domestic automotive sales channels by joint venture forces the supply of parts and the post-automotive market to be monopolized by foreign capital. Local enterprises' low technical ability and low value-added value acquisition mode inhibits the overseas extension of the value chain of the automobile industry. Therefore, the formulation of national industrial policy should be closer to "competitive neutrality", so that the automobile market can achieve full competition. Enterprises should strengthen the construction of technology platform, the key parts of the automobile technology to implement a precise

breakthrough. Consumers should cultivate a correct and rational concept of consumption.

Global supply chains are facing enormous challenges with the resurgence of counter-globalization and the resurgence of trade and investment protectionism. There are several questions being explored by policymakers and academics. Whether the segmentation of GVC in China's automobile industry will continue. And how to strive to achieve a breakthrough in key component technology, stimulate the enterprise's automobile export initiative to help improve the value chain segmentation phenomenon. Whether the vulnerability of China's automobile industry in the international competition will also face the dilemma of GVC segmentation in the development of the new energy vehicle industry. This deserves wide concerns by businesses and policymakers. At the same time, there are some shortcomings in the article. Due to the availability of data, this article does not make clear calculations of the value added and length of the GVC of the Chinese automotive industry in China in recent years. This point needs further study by scholars.

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With the support of three funds, this paper has the following contributions: As one of the industries with high capital and technology intensities, the automobile industry has a certain fracture phenomenon in participating in the global value chain. And the reasons for the fracture are also explained from two major aspects at home and abroad. This shows that when treating certain strategic industries, certain policies should be formulated in accordance with the characteristics of the industry itself. At the same time, with the opening of technology and markets, the automobile industry in China is developing in the direction of new energy. This new trend means that new market rules have changed, and global trade rules have also changed.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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