

Research on Upgrading of China Passenger Car Parts Industry: Based on Global Value Chain

Wang Long

School of Economics, Wuhan University of Technology, Wuhan, P.R.China, 430070

(E-mail: zmwl@whut.edu.cn)

Abstract Based on the theory of global value chains and the industrial structure upgrading, this paper analyses the characteristics and the position of passenger car parts industry of china in the global auto industry value chains, the result shows that Chinese passenger car parts enterprises have still been in low-end value link in the global value chain. The paper puts forward the industry upgrading path and main objective of passenger car parts industry in China. The countermeasures on the upgrading of passenger car parts industry of China are given at the end of the paper.

Key words Global value chain; Industry upgrading; Automobile parts; Passenger car

1 Introduction

In recent years, passenger car industry of China has seen rapid development and so has been its parts industry which is the basis for the automotive industry. However, the latter obviously lags behind the vehicle industry, restricting China from turning from a big country of automobile industry to a powerful country of automobile industry. So the structural adjustment and upgrading is a necessity for the development of parts industry or even the automotive industry in China. Increasing emphasis has been putting on the upgrading of automobile industry and parts industry at home and broad.

After systematic study on the global automotive industry value chain, Humphrey and Memedovic (2003) believed that the upgrading of the auto industry, particularly the function upgrading of parts suppliers in developing countries depends on the support of government policy. Zhou Yu and Nie Ming (2006) analyzed the advantages and disadvantages of joint venture model and the model of independent innovation in China auto industry upgrading and drew the conclusion that the second model is superior and put forward corresponding suggestions from the perspective of the global value chain. Yang Dongjin and Liu Renhuai (2008) compared and contrasted merits and demerits of the independent model and embedded mode of the global value chain, proved the first model more reliable and of better performance. Zhang Laichun (2009) discussed implications of industrial upgrading in the mode of international value chain division, analyzed the role Shanghai auto industry played in this division, and proposed such countermeasures to speed up Shanghai auto industry upgrading as pooling research power, increasing chain control, integrating vehicle and parts enterprises, and enhancing resource integration ability and the chain's driving force, developing the auto sales service, etc. This paper attempts to explore the connotations of the upgrading of China passenger car parts industry and its selection on upgrading path.

2 Connotations and Modes of Industrial Upgrading

There are different views in implications of industrial upgrading. Gereffi (1999) held that industrial upgrading a process where an enterprise or economic body advances toward a capital and technology-intensive field which can bring in more profit. Kaplinsky (2001) believed it refers to manufacture products more effectively or better or to engage in activities requiring more skills. Poon (2004) referred it as an economic role transfer process in which the manufacturer successfully transfers the labor-intensive and low-value production to that of higher value capital or more technology-intensive chain All in all, industrial upgrading in the global value chain is a dynamic process evolving from a low-skilled, low value-added state to a high-tech, high value-added state.

From the perspective of the value chain, Humphrey and Schmitz (2002) clearly introduced an enterprise-centered classification method of 4 levels: process upgrading, production upgrading, functional upgrading and industry upgrading.

A basic viewpoint of global value chain theory is that not all value links in a value chain create equal value, only some specific ones can create higher added value and they are generally the strategic links in the global value chain. Therefore, the key to industrial upgrading based on global value chain lies in the controlling the strategic links.

3 Features and Position of China Passenger Car Parts Industry

As its passenger car parts industry can already satisfy over 80% matching demand of parts localization of commercial vehicles and luxury passenger cars, and can also manufacture most components for vehicle matching, China is on the way to be the important sourcing base for international auto manufacturer and R&D center of core products for multinational corporation, and is continuously being integrated into the global automotive industry value chain. However, as it has mastered no core technology, mainly engaged in labor-intensive and processing products, it is still among the low-end value links in the global value chain.

3.1 Scale and economic performance for domestically-funded enterprise

Generally speaking, passenger car parts industry of China has low industry concentration, poor economic performance and the domestically-funded enterprises are small-scale. In the over 7580 domestic components enterprises above designated size, 1318 are overseas-funded enterprises, accounting for 17%, 474 Hong Kong, Macao and Taiwan invested enterprises, accounting for 6%; among those overseas-funded enterprises, wholly (solely) foreign-owned enterprises take up 55%, and Chinese-foreign joint ventures 45%, of which 66% are foreign holding. Right now, the trend of wholly foreign-owned and holding is increasingly prominent. And foreign-funded enterprises are doing better in general in terms of economic performance, and their average profit margin is 8.7% while that for domestically-funded enterprises is 4~7% (shown in Table 1).

Table 1 Contrast of Income and Performance Between Different Auto Parts Enterprises in 2007

(Unit: %)

Corporation sort	Number	Percentage of total industrial output value	Percentage of operation revenue	profit margin	return on assets
Foreign-owned	17	41	42	8.7	10.6
State-owned	8	8	8	3.8	3.8
Mixed	20	24	23	6	6.9
Private	49	21	20	6.4	8.8
Hongkong-Macao-Taiwan	6	6	7	6.8	6.8

Source: DRC, China Association of Auto Manufacturers, VAG, China Auto Industry Development Report(2009), Social Sciences Academic Press, 2009

3.2 Proportion of firm's market share and industry concentration ratio

Automobile parts exports of China has been growing rapidly in recent years(only slowed down in 2008 because of the financial crisis), and its proportion has been increasing steadily in the global automotive exports, becoming the world's fourth (following U.S., Japan, Germany) largest producer and exporter of auto parts.

In 2008, the value of foreign trade of China auto parts was 51.3 billion \$, imports 16.28 billion \$ and exports 35.05 billion \$. Exports value of auto parts accounted for 76.4% of that of auto products (shown in Table 2). Since 2006, China has been accounting for over 10% in the global auto parts exports value.

Table 2 Foreign Trade of China Auto Parts during 2004-2008 (unit: hundred million \$;%)

Chinese Auto Parts	2004	2005	2006	2007	2008
Value of Foreign Trade	201.7	257.1	348.7	447.8	513.3
Growth Rate of Value of Foreign Trade	39.1	27.4	35.6	28.4	16.4
Imports Value	97.1	101.5	133.1	152.9	162.8
Growth Rate of Imports Value	62.9	48.8	38.5	36.9	18.8
Exports Value	104.6	155.6	215.5	295	350.5
Growth Rate of Exports Value	20.3	4.5	31.2	14.8	6.5
Proportion in Foreign Trade Surplus	2.32	5.31	4.64	5.42	6.35
Proportion in Exports Amount of Global Auto Part	7.3	9.2	11.5	-	-

Sources: DRC, China Association of Auto Manufacturers, VAG, China Auto Industry Development Report(2009), Social Sciences Academic Press,2009

Although China's exports of auto parts has been increasing rapidly, most are low value-added, resource-and labor-intensive like aluminum wheels, water tank, glass, wire bundles. They are little technology added and low export value-added products with low OEM market share, and access only to low-end maintenance markets generally. Take car wheels for instance. While the value of car wheel exports was 18.3% in total export of auto parts in 2008, key component exports only took up 18.3% (shown in Table 3).

According to statistics from China Automobile Industry Yearbook, solely foreign-owned enterprises topped the list, taking up 34.8% of total exports; next were Sino-foreign joint ventures (24% of total exports), in which those with foreign investment took up 59.3%; private (individual) business accounted for about 22.4%; state-owned enterprises account for only 14.7%. What's more, most key saloon car parts were manufactured in solely foreign-owned or Sino-foreign joint ventures enterprises.

Table 3 Ratio of Auto Parts Export Product in 2008 (unit: \$ ten thousand)

Export Product	Value	Percentage in Export Amount of Auto Parts %
Auto Engine and its Parts	363287	11.7
Gear Case Assembly	49459	1.6
Clutch and its Parts	42517	1.4
Brake and its Parts	173200	5.6
Drive Axle Assembly	22989	0.7
Dead Axle and its Parts	27998	0.9
Wheel and its Parts	327133	10.5
Suspension Damper	65180	2.1
Steering System and its Parts	72442	2.3
Body	23051	0.7
Body Accessories and Parts	272805	8.8
Automobile Lighting and Signal Device	142192	4.6
Auto Electronics and Instruments	514291	16.5
Air-conditioner	4871	0.2
Auto Tyre	404906	13
Auto Glass	52996	1.7
Other Auto Parts	364418	11.7
Trailer, Semitrailer and their Parts	186238	6
Total	109973	100

Source: Chinese Auto Industry Almanac, 2009

3.3 Inadequate R&D investment

R&D investment in China auto parts industry has seen a relatively rapid growth, but does not match the sales revenue of more than 25% average annual growth rate. According to China Automobile Industry Yearbook (see Table 4), R&D investment in the car and motorcycle parts industry in China accounted for respectively 1.98%, 1.91% and 2.16% of the main business income in the past three years while those in Bosch, Denso, Delphi, Valeo, etc accounted for 7% to 10% of the sales revenue. International auto components industry was 12~16 time higher than national auto components industry in the proportion of R&D investment to annual revenue.

As a direct result of inadequate R&D investment, China auto parts industry has been poor in self-innovation. At present, 90% of the market share and manufacturing capability of domestically-funded enterprises are concentrated on low-end parts production, and among the remaining 10% of most high-end products, a majority are manufactured by Sino-foreign joint ventures. For example, all the EFIs, EMSs, differential assemblies, torque converters, electric sunroofs and airbags were manufactured by overseas-funded enterprises in 2008, and 93% of ABS, 98% of micro-motors, 90% of central controllers were manufactured also by foreign enterprises.

Table 4 Ratio of R&D Investment to Main Business Income in Auto Industry in Years 2001-2008
(Unit: hundred million yuan; %)

Year	Automobile			Automobile and Motorcycle Parts			
	R&D expenses (C)	Prime Revenue (D)	Operating C/D	R&D expenses (K)	Prime Revenue (L)	Operating K/L	
2001	33.8	2457.7	1.38%	15.5	829.3		1.87%
2002	56.3	3406.8	1.65%	13.9	1261.1		1.10%
2003	65.8	5141.6	1.28%	22.9	1588.2		1.44%
2004	75.1	5490.5	1.37%	30	1960.6		1.53%
2005	94.8	5582.9	1.70%	46.7	2633.6		1.77%
2006	118.6	7339.2	1.62%	81.5	4122.2		1.98%
2007	162.9	9253.7	1.76%	93.4	4901.8		1.91%
2008	208.1	18355.9	1.13%	111.5	5153.5		2.16%

Source: Chinese Auto Industry Almanac 2009

Overall, auto parts industry of China started to be embedded in the global value chain from low value-added and labor-intensive low-end value links, while high value-added value taches at both ends of the value chain are in control of multinational companies. Thus, Chinese auto parts enterprises have been in the stations that only in the middle section of the "smile curve", subject to the squeeze from the high value-added taches. The monopoly position of overseas-funded enterprises in the domestic auto parts market is becoming even more prominent, marginalizing auto parts industry of China in the global chain.

4 Upgrading Path for China Auto Parts Industry

In line with above theories and status, upgrading path for auto parts industry of China must reflect the comparative advantage of our resources and the immanent and essential requirement of the global value chain, to realize overall industrial upgrading on the basis of enterprise upgrading.

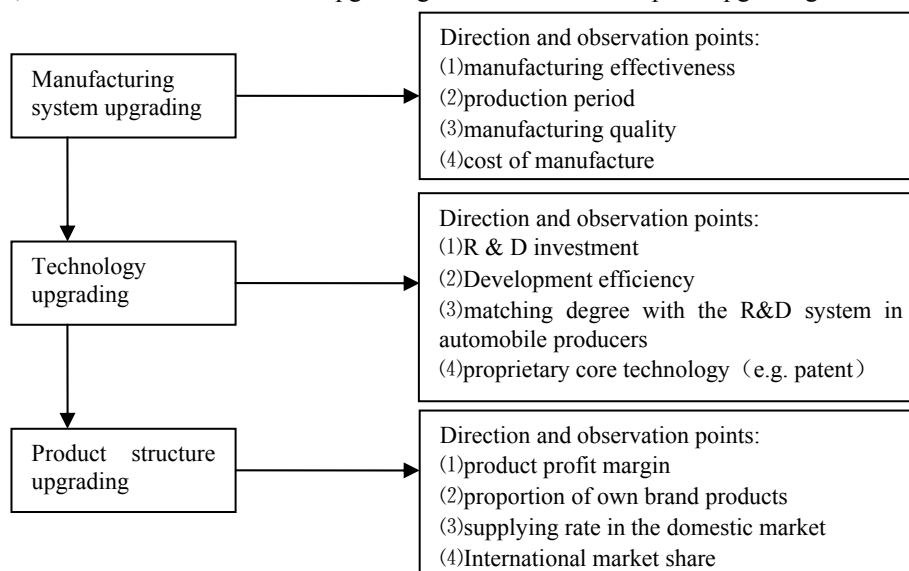


Figure 1 Upgrading Path at the Enterprise Level

4.1 Upgrading path at the enterprise level

Upgrading of relevant enterprises lays the foundation for that of China auto parts industry. Upgrading path at the enterprise level should start from the manufacturing system, then to enterprise technology, eventually to upgrade the product structure (see Diagram 1).

Chinese auto parts enterprises should first increase the enterprise technology management level,

adopt advanced production methods and improve labor productivity to achieve manufacturing system upgrading; then raise the enterprise's development efficiency and increase its matching with the R&D system in automobile producers to grasp proprietary core technology, to realize technology upgrading; finally develop its own brand products, to achieve product structure upgrading; through this path China can upgrade its auto parts enterprises.

4.2 Upgrading path at the industrial level

This level of upgrading comes after the upgrading at the enterprise level. Chinese enterprises should integrate parts manufacturers, develop parts industry clusters, optimize industrial structure and further escalate industrial technology, to upgrade China's auto parts industry ultimately. Industrial upgrading includes industrial organization structure upgrading, industrial technology upgrading and industry chain upgrading (shown in Figure 2).

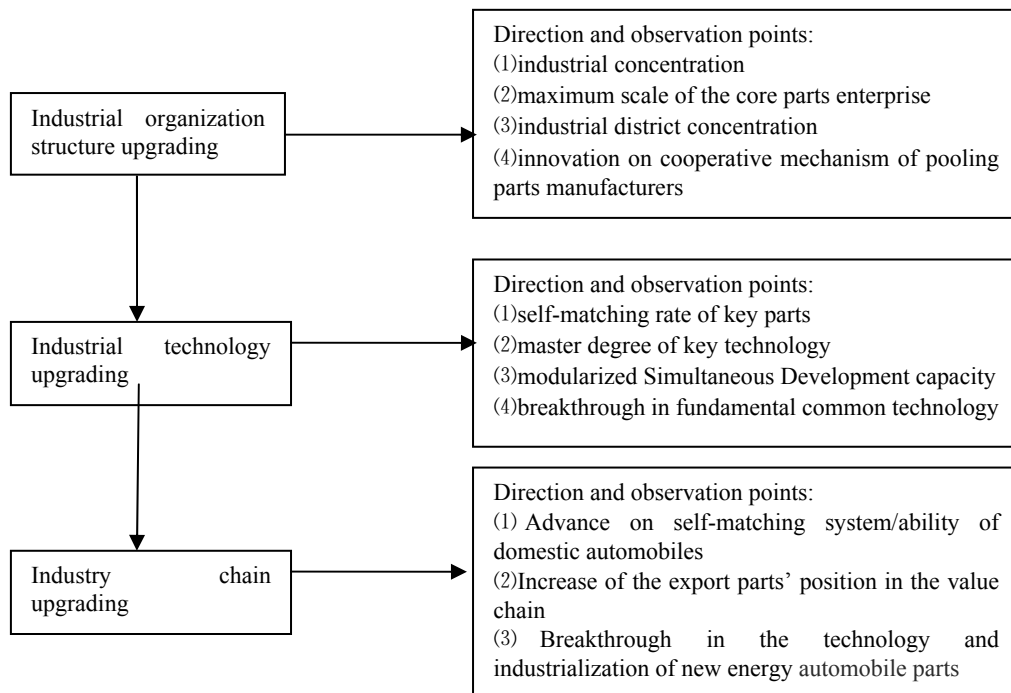


Figure 2 Upgrading Path at the Industrial Level

5 Conclusions

China passenger car parts industry is still a low-end value link in the global value chain, and doesn't have relevant key technology. Thus the key to achieve the upgrading of this industry is to have independent rights, occupy initiatives such strategic links with high additional value as technology R&D and own brand, to eventually become a manager of the global value chain. In terms of policy options, the first step is to promote strategic restructuring of the parts industry, adjust the industrial structure, follow the path of joint reorganization, establish specialized groups with economies of scale, form a parts industrial structure with reasonable hierarchies in which the work is divided based on specification. Then, we should increase R&D investment to develop independent core technology, make breakthroughs in technology for key auto parts, especially in proprietary core technology for key parts of passenger cars, and improve the ability of matching with the vehicle manufacturers. The third is to develop high value-added, high-tech products, to achieve industrial upgrading; auto parts enterprises should pay more attention to R&D of environmental protection, energy saving technology, and strive to make automotive components achieve environmental protection and energy conservation, increase the proportion of electronic components in the vehicle to make cars more electronic, intelligent, and further develop the renewable technology of scrap material of auto parts, to finally achieve the industrial upgrading of passenger cars industry and the parts industry.

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