

China's Growing Role in U.S. Automotive Supply Chains

David Coffin

Abstract

This paper examines the growth of the Chinese automotive supplier industry. First, it examines factors that helped the Chinese automotive supplier industry develop including supportive domestic policies, and interaction with global vehicle manufacturers and parts suppliers. Second, the paper describes major Chinese automotive parts suppliers and how they compare to global parts suppliers. Finally, the paper examines U.S. automotive parts imports from 2007 to 2017, particularly focusing on those parts where imports from China have grown significantly, including brake systems and miscellaneous parts.

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Introduction

The Chinese auto parts industry has grown rapidly over the last twenty years, initially driven by the expanding Chinese vehicle manufacturing industry. Following this domestically driven growth in demand, Chinese automotive parts suppliers have also begun supplying vehicle manufacturers and the aftermarket in foreign markets, including the United States.¹ In 2018, China was the United States' second largest source of automotive parts imports (after passing Canada in 2017), accounting for nearly twice the share of U.S. auto parts imports (three times the value) that it accounted for in 2007.² China, however, is unique among the top six parts supplier countries to the United States, in not being a significant source of U.S. vehicle imports. The U.S. automotive supply chain has been a primary focus of a number of U.S. actions, including renegotiations of trade agreements and a recently completed 232 investigation. Considering the significant focus of U.S. (and Chinese) policy on U.S.-China trade, and on the automotive industry, it is important to understand the extent that Chinese parts are used in the U.S. automotive supply chain.

This paper will examine the growth of the Chinese auto parts industry and the increasing importance of Chinese parts in U.S. automotive supply chains. The first section describes major factors that encouraged the growth of the Chinese automotive parts industry. The second section examines how Chinese auto parts companies rank in one major ranking of global automotive parts suppliers, and whether that is a useful measure of the significance of Chinese auto parts companies. The third and final section looks at U.S. automotive parts imports from China, breaking imports into segments, and the specific parts where China is a significant supplier. Where available, this paper includes data from as early as 2007 (the last full year before the economic downturn) to the most recent year.

Drivers of Chinese Automotive Supplier Development

The Chinese automotive parts industry has grown significantly since 2007, alongside the growing vehicle manufacturing industry. Key drivers of this growth have been domestic industry demand, Chinese government policy, and strengthened integration into global supply chains.

The Chinese vehicle manufacturing industry grew to become the largest in the world during this period. Vehicle manufacturers in China produced 27.8 million vehicles in 2018, more than twice then next highest country.³ Vehicle manufacturing in China is a mix of domestic production and production by joint ventures, with 56 percent of vehicles produced by joint ventures, and 44 percent solely by

¹ Automotive parts have two distinct markets, vehicle manufacturers and consumers (the aftermarket). Vehicle manufacturers install parts into their vehicles as part of the vehicle assembly process. Vehicle manufacturers work closely with suppliers, negotiating all of the aspects of the part including quality, quantity, and price. Consumers purchase parts to replace worn or broken parts in their vehicle. These purchases are typically from retail outlets. Parts suppliers can be focused on either or both markets.

² Dataweb (accessed April 11, 2019). NAICS 3363. This paper examines the period from 2007 to 2018, rather than a five or ten year period in an attempt to have the beginning of the period examined before the economic downturn.

³ Ward's Automotive Yearbook 2019, "China Vehicle Production by Month, 2018," May 2019.

domestic companies.⁴ At least 80 brands participate in the Chinese light vehicle market, with a number also participating in the heavy vehicle market.⁵ Growing Chinese vehicle production has driven increased automotive parts demand in China.⁶

Chinese government policies have also had a significant impact on the growth of the Chinese automotive part industry.⁷ While the central government has primarily focused on developing the light vehicle industry, it has directly and indirectly encouraged supplier development in its automotive plans. The Chinese government's support for domestic parts suppliers evolved since 1994. In the 1994 Policy on Development of the Automotive Industry, the Chinese government offered reduced taxes and other support to parts suppliers that "reach economic scale."⁸ The 2004 plan featured a separate chapter for parts production, encouraged the spinoff of internal parts units into independent enterprises, supported parts enterprises taking part in product development (which had previously been done by vehicle manufacturers), and offered preferential treatment to parts suppliers with multiple vehicle manufacturers as customers that entered global supply chains. One paper published in 2012 estimated that from 2001 to 2011 Chinese auto parts companies received \$2.3 billion in direct subsidies. In addition, the paper claims that there were significant indirect subsidies to the auto parts industry via support for other industries that lowered the cost of inputs into the auto parts supply chain.⁹ In the 2017 Medium and Long-term Plan for the Chinese Automotive Industry, one of the five planning objectives was to further develop automotive suppliers, with some suppliers becoming top ten global automotive parts suppliers.¹⁰

The Chinese government introduced more detailed plans for automotive parts suppliers over time. The 1994 plan had goals for engines and electronics. The 2004 plan included automotive electronics, and a focus on alternative energy and fuels. The 2012 New Energy Vehicle (NEV) plan specifically encouraged the development of the EV battery industry, as well as further research on specific parts, including supercapacitors.¹¹ Chinese government investments in electric vehicles began at least five years earlier, and have been direct (through supporting the building of EV battery factories) and indirect (through subsidies for the purchase of electric vehicles).¹² Beginning in 2015, MIIT required NEVs to use batteries from a whitelist of approved batteries in order to receive government subsidies.¹³ The 2017 Medium

⁴ Author's calculations based on Ward's Automotive Yearbook 2019, "China Vehicle Production by Month, 2018," May 2019.

⁵ While the number of brands is high, the number of vehicle manufacturers is smaller, as domestic firms and foreign firms sell multiple brands in the Chinese market. Author's calculations based on Ward's Automotive Yearbook 2019, "China Vehicle Production by Month, 2018," May 2019.

⁶ Lu et al., "Exploring the Upgrading," May 20, 2015; Thun, "Innovation at the Middle of the Pyramid," 2018.

⁷ Thun, *Changing Lanes in China*, 2006, 7.

⁸ People's Republic of China, "Formal Policy on the Development of the Automotive Industry," February 19, 1994.

⁹ These indirect subsidies were calculated based on government policy statements concerning support for coal, electricity, natural gas, glass, and cold-rolled steel industries. Haley, "Putting the Pedal to the Metal," January 31, 2012, 1, 20, 32–33.

¹⁰ MIIT, "Notice of the Three Ministries and Commissions on the Issuance of the Medium and Long-term Development Plan for the Automobile Industry, September 4, 2017.

¹¹ China State Council, "Notice of the State Council on Printing and Distributing the Energy-saving and New Energy Automobile Industry Development Plan (2012–2020), July 9, 2012.

¹² Bloomberg News, "The World's Leading Electric-Car Visionary Isn't Elon Musk," September 26, 2018; Kawakami, "Brutal Culling Awaits China's EV Battery Makers as Support Ends," February 9, 2019.

¹³ Kennedy, "China's Risky Drive into New Energy Vehicles," November 19, 2018, 9.

and Long-term Plan encouraged development in specific core and key parts areas for future vehicles, including power batteries, vehicle sensors, components for modular development, and automotive semiconductors. It also encouraged the development of specific plans and innovation centers for shared research.¹⁴

Finally, Chinese automotive parts suppliers have grown and increased their production and technological capacity through their supply relationships with joint venture vehicle manufacturers in China and participation in joint ventures with foreign parts suppliers. One paper compared the importance of connections to foreign companies versus the importance of developing internal capabilities for Chinese parts suppliers attempting to enter global value chains. That paper found that both were important, but perhaps connections with foreign companies (called external linkages in the report) are becoming less important for parts suppliers as they have become more established.¹⁵ Another paper found that component firms were successful because of their varied relationships selling different products at different price points to private domestic vehicle manufacturers, state-owned enterprises, and joint ventures.¹⁶

According to estimates from Orbis' Cross Border Investments, foreign companies invested nearly \$10.7 billion in automotive parts activities in China from 2013 to March 2019. For comparison, Orbis estimates foreign companies invested over \$8 billion in auto parts in the United States during the same period.¹⁷ Several papers credit local Chinese companies' experiences working with or supplying foreign parts suppliers that invested in China as helping them to enter the global automotive supply chain.¹⁸ For example, Yanfeng entered into a joint venture with Ford (later Visteon) in 1994, and (as mentioned earlier) participates in a joint venture with Adient (U.S.-headquartered) on seating and other parts of the vehicle interior¹⁹

As Chinese auto parts suppliers' relationships with global vehicle manufacturers developed, the Chinese suppliers tended to expand overseas through foreign acquisitions or greenfield investments. Chinese-owned plants in other countries are significant suppliers of parts to U.S.-produced vehicles. Zozo Go estimated in 2018 that 105 Chinese suppliers and auto-tech firms had operations in the United States, more than double the number they found in 2016.²⁰ Some Chinese manufacturers first began supplying U.S. vehicle manufacturers in China, then later invested in production in the United States, while other acquired suppliers in the United States.²¹ For example, Yanfeng first supplied Shanghai GM in China, and

¹⁴ MIIT, "Notice of the Three Ministries and Commissions on the Issuance of the Medium and Long-term Development Plan for the Automobile Industry," September 4, 2017.

¹⁵ Lu et al., "Exploring the Upgrading," May 20, 2015.

¹⁶ Thun, "Innovation at the Middle of the Pyramid," 2018.

¹⁷ Orbis Cross Border Investments, (accessed April 3, 2019).

¹⁸ Hertenstein et al, "Internationalization Within Networks," 2015, 8, 13; Lu et al, "Exploring the Upgrading," May 20, 2015.

¹⁹ Yanfeng Automotive Interiors Company Website. (accessed December 20, 2018).

²⁰ Dunne, "China's industry has arrived in America," November 5, 2018.

²¹ Dunne, "China's industry has arrived in America," November 5, 2018; Hertenstein et al, "Internationalization Within Networks," 2015, 8, 13.

then its first foreign investment in 2011 was the purchase of an Ohio plant to supply GM.²² Yanfeng is now a global supplier of interior trimming and seating for GM.²³

Chinese companies have acquired a number of foreign parts suppliers with existing contracts in global supply chains. AEI's Global Investment Tracker lists 41 Chinese investments outside of China involving automotive parts totaling nearly \$21 billion from 2005 to 2018.²⁴ Nearly \$17 billion of those were acquisitions of foreign auto parts suppliers, another \$2.1 billion were greenfield investments, and the rest were stock investments and joint ventures.²⁵ One significant example of a Chinese acquisition of a foreign parts supplier to enter a supply chain was Key Safety Systems' purchase of Takata, a major airbag supplier, in 2016.²⁶

Global Position of Chinese Auto Parts Suppliers

Chinese parts suppliers appear to account for an increasing share of global production. One proxy measure for tracking that growth is to look at the listing of Chinese automotive parts suppliers in the Automotive News Top 100 Global OEM Parts Suppliers list, an annual listing of top automotive suppliers. The number of Chinese automotive parts suppliers making the Automotive News Top 100 Global OEM Parts Suppliers list has increased in recent years. The Automotive News' 2007 Top 100 Global OEM Parts Suppliers list did not include any Chinese companies.²⁷ Automotive News' 2011 Top 100 Global OEM Parts Suppliers list included CITIC Dicastal Co., which was listed for the first time at number 97, with \$1.3 billion in global revenue (27 percent in North America), and was the only (first) Chinese parts supplier listed.²⁸ In 2014, Johnson Electric Group entered the list at number 98, with \$1.3 billion in revenue (19 percent in North America), and CITIC climbed to number 83 with \$2.1 billion in revenue (25 percent North America).²⁹ By 2017, the Automotive News listed six Chinese companies in its Top 100 Global OEM Parts Suppliers list (table 1).

Table 1 How Chinese automotive parts suppliers stack up in global parts supplier revenue rankings, 2017

Company	Global rank	2017 Global revenue	Percent North America 2017
Yanfeng	16	14.3	29
BHAP	65	3.7	13
CITIC Dicastal Co.	71	3.1	25
Johnson Electric Group	79	2.3	31
Wuling Industry	80	2.3	0
Mint Group	92	1.8	19

Source: Automotive News, "Top 100 Global OEM Parts Suppliers," June 25, 2018.

²² Hertenstein et al, "Internationalization Within Networks," 2015, 18–19.

²³ Hertenstein et al, "Internationalization Within Networks," 2015, 19.

²⁴ AEI, "China Global Investment Tracker," (accessed April 8, 2019).

²⁵ AEI, "China Global Investment Tracker," (accessed April 8, 2019).

²⁶ Tajitsu, "Key Safety Systems Completes Deal," April 11, 2018; Yue, "FountainVest to Sell," February 4, 2016.

²⁷ Automotive News, "Top 100 Global OEM Parts Suppliers," June 23, 2008.

²⁸ Automotive News, "Top 100 Global OEM Parts Suppliers," June 17, 2013.

²⁹ Automotive News, "Top 100 Global OEM Parts Suppliers," June 16, 2014.

The parts suppliers listed among the top 100 produce different kinds of parts and supply different customers. Yanfeng specializes in automotive interiors, has a technical center in Michigan, and multiple plants in the United States. It is by far the largest company listed on the rankings.³⁰ Five more Chinese parts suppliers' reported automotive parts revenues high enough for Automotive News to rank them among the top 100 global parts suppliers, albeit outside the top 60. Beijing Hainachuan Automotive Parts Co (BHAP) is a subsidiary of Beijing Automotive Industry Holding Company, which is a major Chinese vehicle manufacturer. BHAP produces a wide range of automotive parts, has joint ventures with major global suppliers including Magna, ZF, and Hella. BHAP counts Mercedes-Benz, Audi, BMW, and Volvo among its customers.³¹ CITIC Dicastal is the largest supplier of aluminum wheel and chassis components in the world, and supplies a wide range of foreign and domestic vehicle manufacturers.³² Johnson Electric produces motors, actuators, switches, and motion sub-system solutions, supplying over 500 OEMs, Tier 1, and Tier 2 suppliers.³³ Liuzhou Wuling Automobile Industry Co. (Wuling Industry) produces auto parts, including engine parts, and vehicles.³⁴ It is unclear whether it supplies parts to other OEMs or not. The Minth group produces trim parts, body structural parts, and seat frame systems, and supplies OEMs making up 80 percent of global automotive sales.³⁵

The complicated structure of Chinese automotive parts suppliers makes it particularly challenging to get a sense of the scale of their companies, making it possible that there are large Chinese automotive parts suppliers not ranked by Automotive News. For example, Huaya Automotive Systems Company (HASCO) owns Yanfeng. However, HASCO is just one of many holdings of the Shanghai Automotive Industry Corporation (SAIC), which is also part owner of Shanghai GM and Shanghai VW, two of the largest vehicle manufacturing joint ventures in China (figure 1).³⁶ Further, the Wanxiang Group is reputedly "China's largest automotive parts supplier" but does not appear on the Automotive News Global Parts Supplier list. Another example was Fountain Vest Partners' acquisition of Key Safety Systems in 2014, subsequent sale of Key Safety Systems to Ningbo Joyson in 2016, and then Key Safety Systems (now owned by Chinese investors) acquisition of Takata (a Japanese airbag manufacturer) in 2017.³⁷ Automotive News listed Takata as a top 50 supplier as recently as 2016, but Automotive News has not listed Ningbo Joyson or Key Safety Systems within its top 100 in subsequent years.

³⁰ Winter, "Yanfeng Automotive Opens New Michigan Headquarters," September 29, 2017.

³¹ Li, "BAIC subsidiary's joint ventures to strengthen auto parts offerings," September 18, 2017.

³² CITIC Dicastal, "Company Profile," (accessed May 7, 2019).

³³ Johnson Electric, "Automotive Products Group," (accessed May 7, 2019); Johnson Electric Group, Annual Report 2016, March 31, 2016, 2.

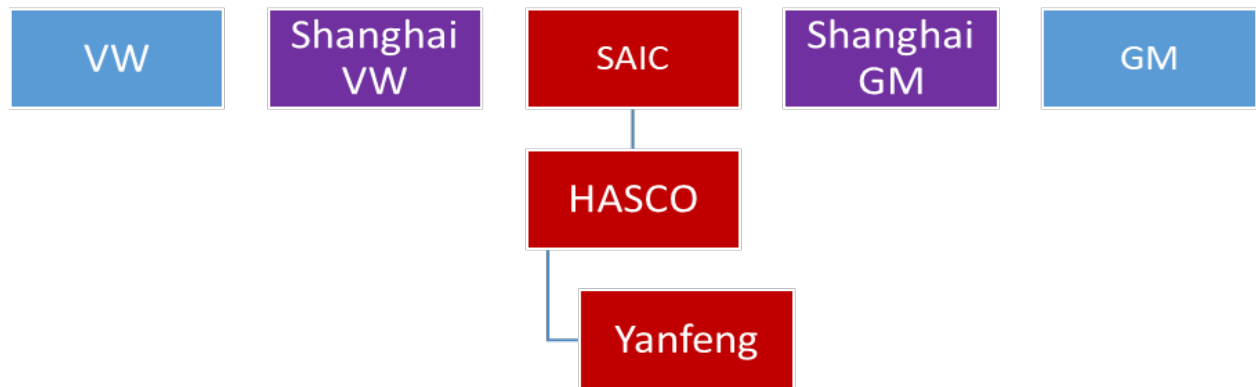
³⁴ Wuling Motors Holdings, "Our Business," (accessed May 8, 2019).

³⁵ Minth Group, "Products," (accessed May 8, 2019); Minth Group, "Introduction," (accessed May 8, 2019).

³⁶ Interestingly, Yanfeng is a major supplier for both GM and VW globally.

³⁷ Tajitsu, "Key Safety Systems completes deal," April 11, 2018; Yue, "FountainVest to Sell," February 4, 2016.

Figure 1 SAIC owns auto parts companies and co-owns JVs with GM and VW



Source: Author created.

Chinese automotive parts exports to the world have also grown significantly during this time period. From 2007 to 2018, Chinese exports to the world of HS 8708 (the largest automotive parts HS code) increased from \$12.2 billion to \$34.8 billion, advancing from being the 9th largest global exporter to 4th.³⁸ The United States was the top destination for such parts, making up \$11.6 billion (nearly one-third) of total Chinese exports of such automotive parts.

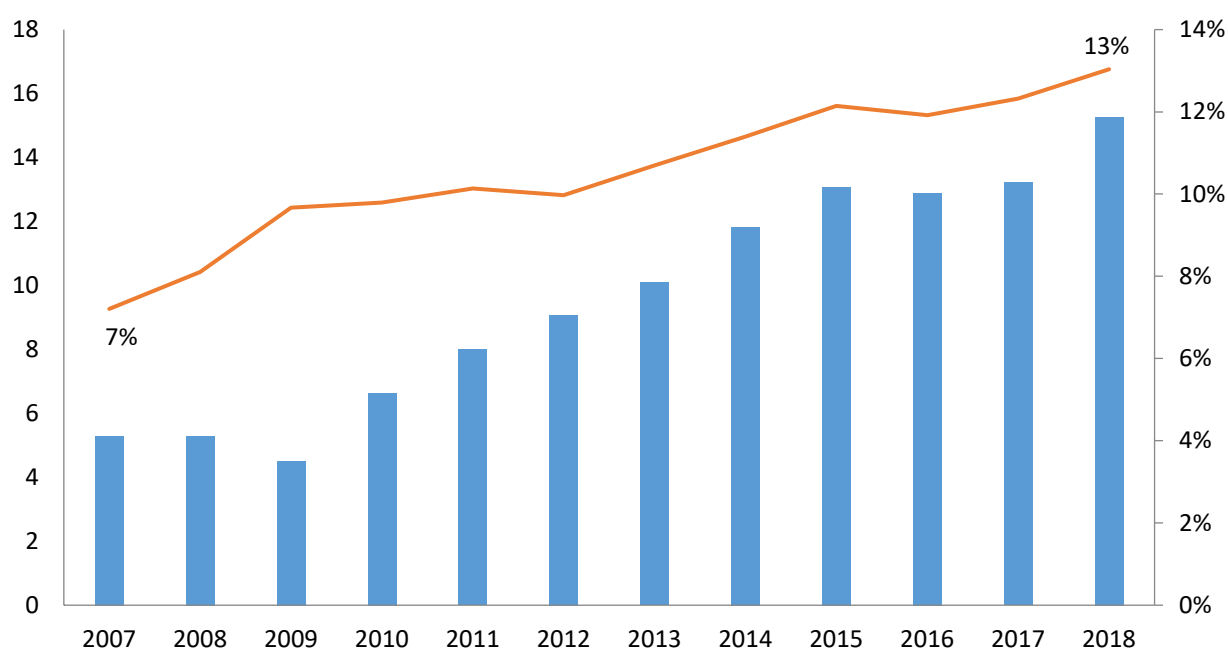
With the exception of Yanfeng, the top global Chinese automotive parts suppliers appear to mainly be tier 2 suppliers, meaning that they supply parts and components to suppliers that produce systems for vehicle manufacturers. The automotive parts industry is often divided into tiers 1, 2, and 3. Tier 1 companies assemble systems that are supplied directly to vehicle manufacturers, conduct their own R&D, and are usually global companies with assembly locations in close proximity to plants that they supply around the world. Examples of tier 1 parts include engines, transmissions, dashboard assemblies, seats, etc. Engines and transmissions are often produced by the vehicle manufacturer, but the other tier 1 parts tend to come from outside suppliers. Tier 2 suppliers supply parts and components to tier 1’s, and tier 3’s supply natural resources to vehicle manufacturers, tier 1’s, and tier 2’s.

³⁸ HS 8708 is used because it incorporates a large share of overall automotive parts trade. It is only a subset of NAICS 3363, but many of the other HS headings with automotive parts, can only separate automotive parts from other goods at a level below the HS-6, which is not harmonized globally. IHS Markit, Global Trade Atlas Database (accessed June 4, 2019). HS 8708.

U.S. Automotive Parts Imports from China

U.S. imports of automotive parts from China have grown significantly, both in terms of value and share of U.S. imports (figure 2), reaching \$15 billion and 13 percent of U.S. parts imports in 2018. U.S. imports from China accounted for an estimated 3.9 percent of U.S. automotive parts consumption in 2016 (most recent year available for U.S. parts production).³⁹ Examining which parts the United States imports from China provides a clearer picture of China’s participation in the U.S. vehicle manufacturing supply chain. This section will break down trade by 5-digit NAICS code, and (where relevant) 8 or 10-digit HTS subheading.

Figure 2 U.S. auto parts imports from China 2007–18, \$ billions and share of total

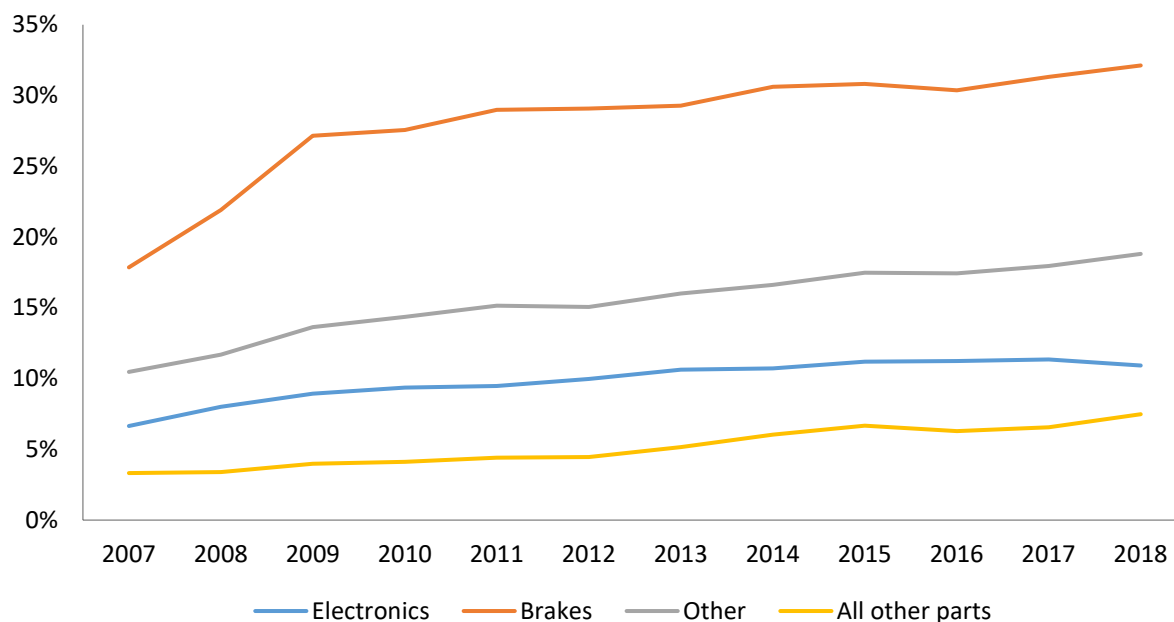


Source: Dataweb (accessed April 11, 2019). NAICS 3363.

The NAICS 4-digit heading for automotive parts has eight major components groups: gasoline engines and engine parts, electrical and electronic equipment, steering and suspension parts, brake systems, transmission and powertrain parts, seating and interior trim, metal stampings, and other. Nearly 47 percent (\$7.2 billion) of parts imports from China came from the “other” category, making up nearly 19 percent of such parts imported into the United States in 2018 (figure 3). On a value basis, the next highest is electronic equipment, which was \$2.4 billion, but imports from China make up less than 11 percent of U.S. imports of such products. This data seems to indicate that the Chinese automotive parts industry has been successful in supplying a range of components.

³⁹ Author’s calculation using ASM (accessed June 5, 2019); Dataweb (accessed June 5, 2019).

Figure 3 Segments of Chinese share of U.S. auto parts imports, 2007–18 (percent)



Source: Dataweb (accessed April 9, 2019).

Note: NAICS codes that correspond to the above listings: Electronics-33632; Brakes- 33634; Other- 33639; All other parts- 33631, 33633, 33635, 33636.

According to an industry representative, Chinese automotive parts are not typically tier 1 parts (i.e. systems supplied directly to the manufacturer), but many of the inputs into those systems, particularly electronics come from China.⁴⁰ A 2016 article described the Chinese automotive industry as specializing in lower value-added “parts, components, and simple assembly activities.”⁴¹ That article also claimed “foreign firms still lead in the production of the core technologies required to manufacture engines, transmissions, and key components and parts.”⁴² One example of an input that goes into automotive parts that later go into vehicles is tapered roller bearings. Tapered roller bearings from China increasingly compete with U.S. tapered roller bearings in the U.S. automotive original equipment market (i.e. are supplied to vehicle manufacturers for use in new vehicles, not only replacement parts).⁴³ The seat frame systems produced by the Minth group are another example; Minth supplies the seat producer with seat frame systems that the seat producer incorporates into the seat before delivering it to the vehicle manufacturer.⁴⁴

Chinese parts may also enter the U.S. automotive supply chain as suppliers of subcomponents for parts produced in Mexico or Canada. Mexico imported more than \$2.2 billion (8.3 percent of such imports) in automotive parts of HS 8708 in 2018, making China Mexico’s second largest supplier of such parts (after

⁴⁰ Industry representative, Interview with USITC Staff, September 2018.

⁴¹ Li, Kong, and Zhang, “Industrial Upgrading in Global Production Networks,” February 2015, 2.

⁴² Li, Kong, and Zhang, “Industrial Upgrading in Global Production Networks,” February 2015, 2.

⁴³ USITC, “Tapered Roller Bearings from China (Fourth Review),” September 2018, 25.

⁴⁴ Minth Group, “Products,” (accessed May 8, 2019); Minth Group, “Introduction,” (accessed May 8, 2019).

the United States). Similarly, Canadian imports of automotive parts of HS 8708 from China in 2018 totaled nearly \$1.5 billion (7.2 percent of such imports, 3rd highest) in 2018.⁴⁵

Electronics

The second-highest segment of U.S. auto parts imports from China is electronics. Generators, lighting, and wiring make up 86 percent of U.S. electronic auto parts imports from China.⁴⁶ These appear to be mostly tier 2 components that a tier 1 supplier is importing to put into a larger system for the vehicle. Lighting was the largest import by value, accounting for over \$1 billion (42 percent of U.S. electronic auto parts imports) in 2018, a significant increase over \$130 million (16 percent) in 2007. Generators imports increased from \$217 million (27 percent of U.S. electronic auto parts imports from China) in 2007 to \$542 million (23 percent of U.S. electronic auto parts imports from China) in 2018.⁴⁷ Wiring sets made up nearly \$500 million in U.S. imports in 2018, but declined from making up 47 percent of U.S. imports of electronic auto parts in 2007 to 21 percent in 2018.⁴⁸ U.S. wiring set imports from China also declined from the fourth largest source (6 percent) of U.S. imports to the sixth largest source (4 percent).⁴⁹

China is a major producer of electronics (including automotive electronics), but little data exists on the scale of its production of automotive electronics. Chinese government data includes annual production of “automobile audio equipment” in units, which increased from 17.6 million in 2007 to 42.1 million in 2017. However, it’s unclear what is included in this category, and the units produced dropped by nearly 100 million from 2016 to 2017.⁵⁰

Brakes

The third-highest segment on a value basis is brake system component imports, which totaled \$1.8 billion in 2018, making up nearly a third of total U.S. imports of such parts.⁵¹ Imports from China appear to be mostly a single component, brake rotors, and not entire brake systems. Brake rotors made up more than half of U.S. imports of brake parts from China each year from 2007 to 2018, increasing from \$406 million in 2007 to nearly \$963 million in 2018.⁵² At the same time, U.S. imports of brake rotors from China increased from 46 percent of U.S. brake rotor imports in 2007 to 64 percent in 2018.⁵³ From 1997 to 2007, the United States imposed anti-dumping duties on aftermarket brake rotors from China, but these duties were removed in 2008 after the USITC found “that revocation of the antidumping duty order on brake rotors from China would not be likely to lead to continuation or recurrence of material injury to an industry in the United States.”⁵⁴ Based on a keyword search for

⁴⁵ IHS Markit, Global Trade Atlas (accessed June 6, 2019). HS 8708.

⁴⁶ Dataweb (accessed April 26, 2019), NAICS 33632.

⁴⁷ Dataweb, (accessed April 26, 2019), NAICS 33632.

⁴⁸ Dataweb (accessed April 26, 2019), HTS 85443000.

⁴⁹ Dataweb (accessed April 26, 2019), HTS 85443000.

⁵⁰ MIIT, “Annual Automobile Audio Equipment Production,” (accessed May 17, 2019).

⁵¹ Dataweb (accessed April 26, 2019). NAICS 33634.

⁵² Dataweb (accessed April 26, 2019). HTS 8708.30.5030 Brake rotors and NAICS 33634.

⁵³ Dataweb (accessed April 29, 2019). HTS 8708.30.5030 Brake rotors.

⁵⁴ The last two aftermarket suppliers moving their aftermarket brake rotor production outside of the United States likely contributed to this decision. The Commission considered OE brake rotors to be a separate industry, and did

“brake rotors” on the Import Genius Database (a database of imports by ocean freight), which yielded few companies that supply vehicle manufacturers, and many companies that supply brake parts solely for the aftermarket, it appears that most of the imports from China continue to be for the aftermarket.⁵⁵

Chinese brake part production data are not readily available.

Batteries

U.S. imports of lithium-ion batteries for motor vehicles from China totaled \$44 million in 2018, nearly double the amount imported in 2015, the first year such imports U.S. customs accounted them separately from other lithium-ion batteries.⁵⁶ China was the third-largest source of such imports in 2018 with a market share of 11 percent.⁵⁷ These batteries are likely not for light vehicles, but instead for buses or off-road vehicles.⁵⁸

Although it is not a major source of EV battery imports for the United States, China is a top manufacturer of electric vehicle batteries, with the most global capacity for producing lithium-ion batteries for electric vehicles. EV batteries are produced by tier 1 suppliers. Chinese lithium-ion battery production is projected to total 50 GWh in 2018, making up 55 percent of global production.⁵⁹ Chinese electric vehicle production totaled 794,000 units in 2017, likely consuming most of these batteries.⁶⁰ Two of the three largest suppliers of electric vehicle batteries globally, CATL and BYD, are Chinese companies.⁶¹ The only plug-in vehicle exported from China to the United States was the Cadillac CT6 plug-in hybrid, and it used cells produced by LG Chem in Korea.⁶²

Engines

U.S. imports of engines from China increased from just less than \$10 million in 2007, to nearly \$108 million in 2018. Spark-ignition engines of greater than 1L but less than 2L (nearly \$50 million) and diesel engines (more than \$48 million) made up nearly all of the U.S. imports. While growth in U.S. imports from China was significant in value terms, in terms of market share, the increases were quite small. Total U.S. imports of motor vehicle engines from China increased from making up 0.2 percent of U.S. engine imports to 1.1 percent.⁶³ The only Chinese engine installed in a vehicle produced in North

not provide any insight as to whether Chinese brake rotors supplied U.S. OEMs in 2007, however, in 1997 the Commission found that Chinese brake rotors were not used by the OEMs. USITC, “Brake Rotors From China, June 2008.”

⁵⁵ Import Genius (accessed June 4, 2019).

⁵⁶ Dataweb (accessed May 3, 2019). HTS 8507.60.0010.

⁵⁷ Dataweb (accessed May 3, 2019). HTS 8507.60.0010.

⁵⁸ Coffin and Horowitz, “The Supply Chain for Electric Vehicle Batteries,” December 2018.

⁵⁹ Sanderson, Hancock, and Lewis, “Electric Cars,” March 5, 2017; Sanderson, “Electric Cars,” May 22, 2019.

⁶⁰ CHTC Motors, “NEV enjoyed strong development,” March 5, 2018.

⁶¹ Sanderson et al, “Electric Cars,” March 5, 2017.

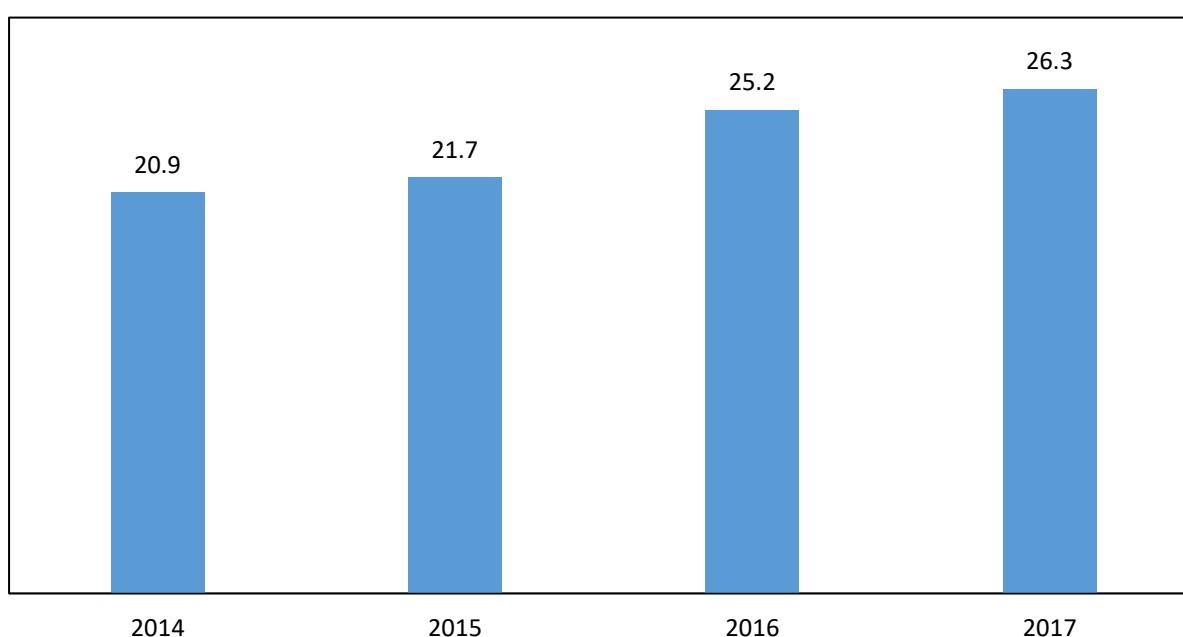
⁶² King, “Chinese-made Cadillac CT6 Plug-In starts US sales,” April 13, 2017.

⁶³ USITC, Dataweb (accessed May 3, 2019). HTS codes: 8408.20.20 8407.31, 8407.32.20, 8407.33.60, 8407.34.14, 8407.34.18, 8407.34.44, 8407.34.48.

America were some Toyota Rav-4 engines.⁶⁴ The sub-assembly level may have significant Chinese contributions.

Although China is not a major source of engine imports for the United States, it is a significant producer of engines. Chinese engine manufacturing expanded from 21 million units in 2014 to 26 million in 2017 (figure 4).⁶⁵ That is nearly twice as many engines produced in China as any other individual country in the database. It is likely that domestic vehicle production consumes most, if not all of these engines, as Chinese vehicle production was millions of units higher than engine production each year.⁶⁶ Automotive World's Engine Plant Database lists 11 engine plants that were established since 2007. These plants produced nearly 2.9 million engines (11 percent of total Chinese engine production).

Figure 4 Chinese Engine Production, 2014–17 (millions of units)



Source: Automotive World, Engine Plant Database 2014–17.

Other

One of the top 8-digit HTS sources of U.S. automotive part imports from China was “Other Parts and Accessories, Not Elsewhere Specified, Of Bodies (including cabs) of heading 8701-8705.” This is a basket category, which includes a wide range of parts and accessories including seat and seatbelt parts, truck

⁶⁴ USDOT, NHTSA, “Part 583 American Automotive Labeling Act Report 2018,” 2018.

⁶⁵ Chinese engine production may actually be higher than reported in the engine plant database, as the sum of engines produced in China per the database and imported engines is a million less than total vehicles produced in China each year from 2014 to 2017. Electric vehicles likely explains some of the gap, but Chinese EV sales during this period were significantly less than a million units per year.

⁶⁶ Imported engines totaled approximately 800,000 units per year, which still falls short of vehicle production. Thus the vehicle production in the database likely does not cover all engine production in China. IHS Markit, Global Trade Atlas Database (accessed June 4, 2019). HS codes 840732, 840733, 840734, and 84082010.

bed accessories, and windshield covers.⁶⁷ U.S. imports from China of this 8-digit line totaled over \$1.5 billion, making China the third largest source of such imports behind Mexico and Canada in 2018.⁶⁸ These appear to be parts that supplied to tier 1 suppliers for assembly into a system for a vehicle manufacturer.

Conclusion

While Chinese production of all automotive parts has increased significantly, U.S. imports of such parts have primarily increased in specific products such as brake rotors and miscellaneous parts, and do not appear to supply many systems directly to vehicle manufacturers. It is difficult to know the extent that these imported components have entered the new vehicle manufacturing supply chain, likely as tier 2 or tier 3 suppliers, though it appears likely that the use of Chinese inputs has increased significantly. Chinese automotive parts suppliers appear to be significant global suppliers, and may continue to grow in the future, both in terms of volume, and moving up from supplying components to designing and assembling systems of components.

The development of the Chinese automotive parts industry illustrates a relatively unique path for accessing global supply chains, with a combination of government policy and interaction with foreign firms. Foreign investment in China brought foreign suppliers into the country that worked with and passed on skills to local suppliers, which were then able to better compete globally. However, China's position is relatively unique, as a domestic market that is large enough that companies want to invest there to sell locally. Smaller developing countries' markets may not be appealing enough to draw enough foreign investment to offer local companies similar opportunities to connect and develop.

⁶⁷ Searched for 8708.29.5060. CBP, CROSS. (accessed April 29, 2019).

⁶⁸ USITC, Dataweb (accessed April 29, 2019). 8708.29.5060.

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