

China's 13th Five-Year Plan: Implications for the Automobile Industry

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Dr. Crystal Chang
Lecturer, Departments of Political Science and International & Area Studies
University of California, Berkeley

It would be a mistake to read the 13th Five Year Plan (FYP) as if one were reading oracle bones for clarity on China's economic future. Rather, it should be understood as the Chinese government's long-winded wish list of what they *would like* to see happen in the economy. The 13th FYP suggests that the Chinese government *would like* to see innovative Chinese-brands dominate the market for new energy vehicles (NEVs).² While there are new and interesting developments that should be monitored closely, the government's ability to realize their objectives are limited. Most NEVs on Chinese roads today are low-cost, low-tech models that were purchased by local governments looking to please Beijing and support local firms. The broader auto market in China is and likely to remain driven by sales of gasoline-powered vehicles, the majority of which are sold under the brands of foreign automakers.

The 13th FYP will probably not have a direct effect on American automakers, which are doing very well in China. In 2015, General Motors (GM) in conjunction with its local partners sold a record 3.6 million vehicles in China (36% of its global volume), making it the market leader. Meanwhile, Ford Motors and its partners sold more than one million units for the first time. The nationalist rhetoric in the 13th FYP may sound alarm bells, but the interests of American automakers will be buttressed by their large and politically influential state-owned partners, whose profitability depends on the continued success of their Chinese-made American cars.

An ongoing concern for the U.S. auto industry lies in declining employment at home, which is loosely tied to China's vast auto market but largely driven by the fragmented and automated nature of today's global automotive production networks. American automakers still tend to "build where they sell," even in the U.S. The problem is that the parts they use to build their cars are increasingly imported from places like Mexico and China, where American parts suppliers have set up large factories. This offshoring of auto parts production is why the record-breaking 17.4 million vehicles sold in the U.S. last year has not translated into more local jobs.

To more fully address these issues, the rest of this testimony is organized as follows:

- I. Role of industrial policy in the development of the Chinese auto industry
- II. Potential effects of the 13th Five-Year Plan on Chinese auto industry
- III. Impact of China's growing auto market on the American auto industry
- IV. Recommendations for Congressional action to support domestic innovation in autos

I. Role of Industrial Policy in the Development of the Chinese Auto Industry

China's auto industry is paradoxically large but weak. Chinese industrial policy has succeeded in creating the world's largest automobile market (24.5 million units in 2015)³, but it has so far been unable to create a national champion the likes of Japan's Toyota or Korea's Hyundai that can effectively compete in global marketplace. In 2015, Chinese automotive exports totaled a modest 728,200 units⁴ (less than 1% of global production), which was 20% lower from the previous year. Most of these low-priced exports are sold in emerging markets, with few going to industrialized countries. Meanwhile, the market share of indigenous Chinese branded vehicles in their home market has slowly declined from over 50% in 2005⁵ to 41% in 2015⁶.

There are two main reasons why China's large auto market struggles to produce a globally competitive automaker. The first has to do with China's joint venture (JV) policy, which has ironically made state-owned enterprises (SOEs) profitable while hampering their motivation to develop their own branded cars. The second reason has to do with the fragmented and fiercely competitive nature of the Chinese auto industry, which has dampened the ability of China's more entrepreneurial independent automakers to build market share, invest in innovation, and achieve economies of scale. Each of these will be explained in further detail below.

The Diminishing Returns of China's Joint Venture Policy

When Chinese leaders decided to open their auto industry to foreign investment in the early 1980s, they had several goals in mind. They believed that the capital and technological expertise of foreign firms would help establish an automotive supply chain in China and jumpstart the country's passenger car production, both of which were essentially non-existent at the time. Imported cars were expensive and put pressure on the little hard currency China had. More importantly, they hoped that by forcing international automakers into 50-50 JV partnerships with China's SOEs, foreign firms would have no choice but to help modernize backward automakers. The hope was that after absorbing the know-how of leading international automakers, one or two of these SOEs would be ready for the global marketplace.

In the early 1980s, passenger car markets in the industrialized world were nearing saturation. This worrisome trend prompted global automakers to seek growth in emerging markets. The alluring market potential of China's large population intrigued some international automakers, which partly explains their surprising willingness to enter 50-50 JV partnerships, share technology with would-be competitors in China, and to work with a government that was not yet well-versed in the language of markets and Western-style capitalism.

The Chinese government believed, perhaps naively, that the 50-50 JV arrangement would limit foreign dominance of the domestic market. Establishing a wholly foreign-owned enterprise to assemble vehicles in China was not an option and to this day is prohibited. What Chinese leaders neglected to do, however, was to require that vehicles produced by JVs be sold under new Chinese brand names. This proved to be a fatal flaw of their strategy. China's first domestically-produced passenger cars carried the logos of well-established foreign brands.

Given their unfamiliarity with consumerism, it is not difficult to see why Chinese leaders overlooked the importance of brands in a market economy.

China's JV policy has achieved some but not all of the original goals of the early reformers. On the one hand, the country boasts the largest automotive market in the world served largely by cars produced domestically. Foreign firms have invested tens of billions of dollars in China. The auto sector has created hundreds of thousands of jobs, spawned a flourishing domestic auto parts industry with export capabilities, and contributed to rapidly growing consumer economy. By that account, Chinese auto policies have been a resounding success.

On the other hand, to the great chagrin of Chinese leaders, foreign-branded cars continue to dominate the domestic market three decades after the first JV was formed. Unlike Japan and Korea, China failed to shield fledgling Chinese automakers from foreign competition in the domestic market, with severe if unintentional consequences. The Japanese and Korean governments forced domestic firms to compete against one another at home but protected them from foreign competition, giving them time to build up their capabilities. It was only after Toyota and Hyundai established brand identities in their domestic markets that they began exporting to other markets like the United States.

China's so-called "Big Four" automakers, Shanghai Automotive Industry Corporation (SAIC), Dongfeng Motor, First Auto Works Group (FAW), and Chang'an Motors each boast annual production in the millions of units. Yet the vast majority of those vehicles carry the brand names of their foreign partners. Sales of their own branded-cars have not been successful and mostly unprofitable, except for Chang'an Motors which is close to breakeven.⁷

SAIC, the largest and often considered the most well-managed of the Big Four, has seen declining popularity of its main Roewe and MG brands. Between 2013 and 2014, Roewe and MG sales dropped from 230,000 units to 180,018 units respectively. SAIC-branded cars accounted for only 7% of the vehicles the company produced that year. Meanwhile, its JV operations with GM and Volkswagen accounted for 59% and 31% of the vehicles produced in SAIC-run factories.⁸

For the most part, JV partnerships are structured such that the Chinese firm is in charge of auto assembly operations and the foreign firm is in charge of new car designs and branding. So while Chinese SOEs have learned a great deal about state-of-the-art manufacturing, they have not been privy to the R&D and marketing aspects of new product development, much of which takes place in the home country of their partners. Foreign automakers have closely guarded the development of their intellectual property and cutting edge technologies. When pressed by the Chinese government to share technology with their JV partners, they tend to pass on second or third generation platform technologies.

In addition, SOE managers are mostly Communist Party officials focused on their next career assignment rather than the long-term prospects of the companies they run. They prefer to stay profitable and maintain full employment rather than take on expensive and risky projects like

designing their new platforms and building new brands. It is both less risky and more profitable for them to focus their efforts on the production of market-proven cars with their foreign partners, even though those cars are sold under foreign brands.

To address these shortcomings of existing JV policies, Chinese leaders are now pressuring foreign firms to help their JV partners develop new Chinese brands when they apply for capacity expansion. Baojun, a new brand launched between SAIC and GM, is one such example. It is unclear whether this strategy will bear fruit, as foreign firms are weary of investing their latest technologies and scarce marketing funds into these co-owned brands. Most will do the minimum to keep Chinese officials happy while focusing on their own brands. Furthermore, new Chinese brands must face a fiercely competitive and fragmented Chinese marketplace.

Origins of China's Fragmented Auto Industry

In the 1950s, Mao Zedong believed that every province in China should have its own truck factory. If one part of the country under enemy attack, vital truck production could continue. At its peak, China had 1,950 small-scale factories producing trucks, motorcycles, parts, and a few cars.⁹ Even though Beijing has repeatedly encouraged consolidation of the industry, provincial and local governments continue to prop up their automakers by procuring their vehicles and giving them access to credit and tax incentives, even if their volumes are small. They do so to retain jobs in not only assembly, but in the supply chain that supports local production. Today, China still has over one hundred state-owned and independent auto assemblers.¹⁰

As the Chinese government began to open the sector to outside investment, a decision was made to pair different SOEs with different foreign firms. The first JV in 1984 was between American Motor Corporation and Beijing Automotive Works, today known as Beijing Automotive Industry Corporation. The second was formed in 1984 was between Volkswagen and Shanghai Automobile Assembly Plant, today known as Shanghai Automotive Industry Corporation (SAIC). The third in 1985 was established between Peugeot and Guangzhou Automotive Manufacturing Plant, today known as Guangzhou Automotive Industry Group.

This trend continued through the 1990s and 2000s, with even a greater number of Chinese SOEs and foreign automakers forming partnerships and opening assembly operations across the country. Instead of a single Detroit, China has a number of regional auto manufacturing hubs in northern China, the central coast around Shanghai, southern China, and western China. In each region lies one to two SOEs with JV operations, each with one to two foreign partners.

Local government support has been crucial to the success of JVs with operations in their region, but it also makes it difficult for any single JV to be successful across regional markets. It is common to find many of the cars on the roads of a Chinese city made by firms with manufacturing operations close to that city. In Shanghai, for example, one finds more cars produced by SAIC's joint ventures with GM and Volkswagen, but far fewer cars produced by Ford, whose JV operations are in Chengdu or by Toyota whose JV operations are in northern and southern China.

The three notable mergers between FAW and Tianjin Xiali, SAIC and Nanjing Auto, and Guangzhou Auto and Changfeng Motors have actually done very little to change the competitive environment. Even the rumored merger of the number two and number three SOEs, Dongfeng Motors and FAW, is unlikely to alter the dynamics of the passenger car market. The vast majority of the passenger cars produced by these two SOEs carry the foreign brands of their JV partners. FAW and Dongfeng produced only 288,000 and 440,000 self-branded cars in 2014, amounting to 11% and 17% of their total annual production.¹¹ This amounted to a combined 3.6% of the passenger car market, hardly enough to worry the competition even if these firms could overcome the political hurdles to a merger.

China's Struggling Independent Automakers

As if the the mosaic of SOEs and JVs was not confusing enough, there are also dozens of independent automakers sprinkled throughout the country, many of which were started by enterprising local officials and a few of which were started by private sector entrepreneurs. These firms are *independent* in the sense that they are newcomers to the industry rather than legacy state-owned factories of the pre-reform era. Until recently, most have been left behind by China's industrial policies, especially the coveted JV partnerships with foreign firms which require Beijing's approval. Despite being latecomers, they have become the bearers of China's leading automotive brands. Once the darlings of the domestic industry, these firms continue to struggle to gain market share from the leading foreign brands.

The most prominent local government-owned automaker is Chery Auto. In the late 1990s, Chery got its start producing low-cost mini-cars that were essentially knock-offs of the Chevrolet Spark subcompact. Although the price was right (less than \$10K), the quality of Chery's QQ model was abysmal. In 2005, Chery announced that it had teamed up with Malcolm Bricklin's Visionary Vehicles and would soon begin importing 250,000 Chinese-made cars in the U.S. Its partnership with Visionary Vehicles quickly fell apart and Chery has yet to export a car to the U.S. In 2012, Chery was permitted to form a 50-50 JV partnership with Jaguar Land Rover, now owned by India's Tata Motors. The partnership has struggled to get its factory up and running. While Chery can claim to be China's leading exporter, most of their cars are sold in emerging markets and volumes are low (87,000 units in 2015). Furthermore, its overall sales volumes have been pretty stagnant for the last few years (550,100 units in 2015).¹²

BYD Auto and Geely Auto are amongst the most well-known independent automakers in the private sector. In 2008, BYD shocked American investors when Warren Buffet decided to invest \$230 million in the company because of the firm's potential leadership in electric cars. Although BYD struggled for a few years, it has recently re-emerged a stronger company. In 2012, it was granted a rare approval by the Chinese government to form a JV with Germany's Daimler to produce electric vehicles for the Chinese market. Shenzhen Daimler began selling its new Denza all-electric car in late 2014, but its price tag of \$60-65 thousand (including subsidies) and somewhat limited range of 200 miles has made the car a tough sell so far.¹³

BYD has made modest inroads into the U.S. market. It has a factory in Los Angeles, California, where it produces rechargeable electric buses to American transit agencies. That factory is expected to produce 300 electric buses in 2016. It has also launched small test fleets of plug-in electric taxis in Chicago and New York City. BYD likes to boast that it sold more NEVs (61,722 units) than any other automaker in the world in 2015, including Tesla Motors (50,580 units).¹⁴ This figure, if accurate, must be qualified. The majority of BYD's sales are from its low-cost plug-in hybrids, not its all-electric models. Less than 9,000 of the vehicles BYD sold were all-electric, which is less than 20% of Tesla's annual sales. And BYD's electric cars are far less sophisticated and shorter range than the Tesla Model S sedan. Furthermore, most of BYD's sales have been to their hometown, Shenzhen. Local officials have been supportive of its homegrown automaker and have purchased over 4,000 electric buses. BYD will have to invest heavily in new car designs and branding if it is to succeed as a mass market consumer producer of electric cars.

Geely made headlines in 2010 when it purchased Volvo from Ford for \$1.5 billion. That was a risky and very expensive move that has yet to bolster the profits of Geely. Though an internationally-recognized brand, Volvo has not won over Chinese consumers who prefer BMWs, Audis, and Buicks. Geely, known as a low-cost producer, has struggled to raise the brand awareness of its Volvo models as well as its own branded vehicles. While Geely cars are not likely to be seen on American roads anytime soon, the company has begun importing Chinese-built Volvos to the U.S. Roughly 1,000 units of its Chinese-made S60 Inscription sedan were imported to the U.S. in 2015. Geely's own brands have also struggled to take hold in China, where they continue to be stigmatized as low-end. Overall, the company only sold a paltry 509,000 units in 2015, on par with Chery.¹⁵

The emergence of these independent automakers was not the result of targeted industrial policies. These firms were not allowed to form JV with foreign firms. That was a privilege reserved for SOEs. Instead, their emergence was an unintended consequence of China's rapidly growing auto industry. With very little capital and technology, these firms were able to quickly launch and ramp up their production of passenger cars by leveraging the modularization of global production networks and China's own rapidly expanding automotive supply chain. These companies started off by copying the designs of foreign branded cars, often buying the very same parts used in those cars from local parts suppliers. As these automotive start-ups gained experience and a foothold in the Chinese market, many started to work with global parts suppliers with operations in China who were also looking to grow their business.

However, as discussed above, independent automakers have struggled to compete against the cars produced by the JVs, which are of higher quality and have better brand recognition. These firms continue to flourish only in the low-end of the market (under \$12,000 per unit), where the foreign-branded cars cannot compete. Most of their consumers are in the countryside and second and third tier cities, where incomes are lower than in first tier cities. While the low-end of the market is large, it is not very profitable. Comparatively speaking, sales volumes for these firms have been very low. Sales of Buicks, just one of many GM brands sold in China, exceeded one million units in 2015.¹⁶

Low volumes and meagre profits have created a business model where most of these firms have little money to invest in R&D and branding. Many continue to rely on copying foreign car designs while others outsource design and engineering to foreign automotive consulting firms like Britain's Ricardo. They have little proprietary technology and many middle class Chinese continue to associate their brands with poor quality and poor reliability. The efforts of independent automakers to compete in the mid-range and high-end of the market have been fruitless and money-losing.

The 11th FYP (2006-2010) was the first to contain the words "indigenous brands" (自主品牌). The government called for one or two enterprises with production capacity of at least 2 million vehicles, 50% of which would be indigenous brands and 10% of which would be exported. The plan also called for several other auto groups with capacities of 1 million vehicles. The overall message of the 11th FYP was that automakers would now be judged not only on their annual production, but also on the development of Chinese intellectual property that could eventually free the Chinese auto sector from reliance on foreign technology.¹⁷ With the rollout of the 13th FYP, the government's goal of creating an innovative indigenous brand with annual sales of 2 million vehicles remains elusive.

II. Potential Effects of the 13th Five-Year Plan on Chinese Automotive Industry

As China has slowly embraced a more market-based economy, the FYP has been transformed from a long list of specific production targets to a long list of strategic priorities. The full text of the FYP has 80 chapters and more than 50,000 characters.¹⁸ The change in the plan's orientation was first reflected in the 11th FYP (2006-2010) when the characters for "plan" (计划) were replaced with those for "guideline" (规划). With the maturation of the market mechanism in the Chinese economy, the FYP has far less impact on competitive sectors like autos. The fact is that today's Chinese automotive market is shaped more by supply and demand than government policies related to the FYP. The one area where the 13th FYP may have some influence is in the area of new energy vehicle adoption.

Declining Influence of Chinese Industrial Policy in A Competitive Marketplace

Since the 2009 Automotive Industry Readjustment and Revitalization Plan, the government has not announced a sector-specific policy, which is perhaps an indication that the government is generally satisfied with the growth of the industry. That was, after all, the year that China overtook the U.S. as the world's largest auto market. Since the 11th FYP, the central government has shifted its attention from overall growth to certain aspects of the auto industry that intersect with high level priorities, especially innovation, the development of indigenous brands, and the adoption of NEVs. The 12th FYP (2006-2010) and now the 13th FYP, the full text of which was released on March 17, 2016, continue to emphasize these same goals.¹⁹

Over the past decade, government incentives to promote NEVs have taken many forms, including direct subsidies to automakers that produce NEVs, subsidies to local governments who purchase green fleets, and a combination of tax breaks and free registration for consumers

who buy green cars. In Shanghai, for example, buyers of NEVs could save up to \$28,600 by taking advantage of free license plates and other rebates.²⁰ Direct subsidies to automakers have recently come under intense scrutiny because of media allegations that some automakers have inflated NEV deliveries to obtain bigger subsidies. Beijing has launched a probe into fraud at regional automakers while several provinces and municipalities including Shanghai have reduced subsidies for the production of NEVs.²¹

Opportunities and Challenges in China's New Energy Vehicle Industry

The international news media has been humming with news that China has become the world's leading market for green cars. While there is some merit to this claim, most of these vehicles are low-cost and low-tech, and most have been purchased by the local governments, not Chinese consumers. In 2015, production of all NEVs in China totaled 340,471 units, of which 152,172 units or 44% were all-electric passenger vehicles.²² Although year-on-year growth has been impressive, NEVs as a whole only comprised a meagre 1.4% of total vehicle production in China last year.

The majority of these vehicles are not particularly sophisticated and have limited ranges. The Kandi EV is a perfect example. The best-selling electric car in China in 2015 (16,736 units), the Kandi EV looks like a cheap knock-off of a Mercedes Smart ForTwo mini-car with a range of 75 miles and a top speed of 50mph.²³ Like BYD Auto, Kandi's main marketing strategy has been to work with local governments to create publicly-run electric car share automated garages that run like vending machines. Its largest customer is Hangzhou, the biggest city in its home province of Zhejiang Province. Hangzhou has plans to expand its car share capacity to 100,000 cars. The rental price is \$3.25 per hour, while the MSRP for the Kandi EV is roughly \$6,317.²⁴ These cars are produced by a JV between Kandi and Geely, which is also headquartered in Zhejiang. Kandi's potential lies not in its cutting edge technology, but rather in its business model and ability to build low-cost electric mini-cars. However, there is nothing proprietary about Kandi's cars and China has dozens of other carmakers pursuing similar strategies.

Many Chinese and foreign automakers alike have announced large investments into NEVs, but the sticker price of the more sophisticated models and paucity of public charging stations have deterred potential Chinese consumers. A large number of Chinese car owners live in apartment buildings, and it remains unclear how many of the country's plug-in hybrids are ever actually plugged in. Widespread adoption of NEVs may also depend on what interface standard the Chinese government decides to adopt for public fast-charging stations. Whether the Chinese government decides to adopt one of the global standards or one that could benefit local automakers will have significant consequences for the industry.

A new and interesting area of development in China is the so-called "Internet of Vehicles." According to a new report by the Mercator Institute for China Studies, the Chinese government is heavily promoting new aspects of vehicle connectivity, between the driver and the vehicle as well as vehicles and transportation systems, the Internet, mobile networks, and satellites.²⁵ The government believes the Internet of Vehicles may offer domestic firms a chance to be leaders

in a new industry and at the same time reduce China's reliance on foreign technology. Most of China's leading automakers have announced investments in Internet-enabled cars.

Many Chinese companies across different industries have become actively involved, including domestic tech giants like Baidu, Alibaba and Tencent. Baidu has even announced that it will start testing its autonomous cars in the U.S., with the target of introducing a commercially viable model by 2018.²⁶ Baidu's chief scientist is Andrew Ng, an artificial intelligence scientist and professor at Stanford University who has previously worked at Google. Hired by Baidu in 2014, Mr. Ng leads a team of 160 people in the Silicon Valley, the majority of whom are working on the driverless car project. In 2015, Alibaba and SAIC announced a \$160 million JV to develop Internet-connected cars. Tencent and Taiwan's Foxconn have also announced a coalition to explore opportunities in smart electric vehicles.

While the Mercator report suggests these developments could lead to "the end of the road for international car makers in China," it is important to recall that some of the Chinese government's past efforts to corner new technologies and shut out foreign companies, such as in mobile telephony, have not been successful. The government threw its weight behind TD-SCDMA, a 3G mobile standard, which has been a very costly commercial failure.²⁷ The most effective way for Chinese leaders to promote the blossoming field of vehicle connectivity would be to focus on setting national safety standards and transportation-related regulations while letting the market decide which technologies and services are best suited to consumer needs. Too much government intervention and favoritism toward SOEs could ruin the potential of the more innovative and Internet-savvy technology companies in the private sector.

On the whole, the 13th FYP is unlikely to have a significant impact on the auto sector. Despite the government's call for innovation and development of indigenous brands, progress on these fronts will be difficult for all the reasons discussed in the previous section of this testimony. The one area that may see some growth is in the adoption of low-cost electric vehicles by local governments. New business models like the Kandi car share which take advantage of China's low-cost production and local government incentives, as well as help solve real problems like traffic congestion and pollution, may have a future in other emerging markets. The Internet of Vehicles is in its nascent stages and it is far from clear which firms will emerge as leaders.

III. Impact of China's Growing Auto Industry on the American Auto Industry

American automakers GM and Ford Motors are doing very well in China. The 13th FYP is unlikely to change their sales prospects going forward. The broader impact of Chinese auto market growth on the U.S. domestic auto industry, however, is more complicated. This section discusses the history of American automakers in China, the changing patterns of automotive trade between the U.S. and China, and the way in which China's expanding auto market has contributed to the divergence of interests between American automakers, parts suppliers, and autoworkers. One of the key takeaways is that while the U.S. market is unlikely to be inundated with cars produced in China, it is already being flooded with parts imported from China.

Overview of American Automakers and Their Operations in China

In 1997, GM formed a JV with SAIC (Shanghai GM), committing \$1.5 billion to the new venture, which at the time was the largest single JV investment by a foreign firm. Shanghai Volkswagen laid the groundwork for Shanghai's emergence as a major automotive manufacturing hub, which greatly benefited GM when it entered China years later. Although Shanghai GM entered the market more than a decade after Shanghai VW, it has become Volkswagen's biggest competitor in China. For several years now, GM has been the market leader in China, accounting for roughly one-third of its sales worldwide.

There are more Buicks sold in China than anywhere else in the world, including in the United States. In 2015, the company sold 223,000 Buicks in the U.S. compared with 1 million units in China.²⁸ Its product line aims covers a wide price range, ranging from the \$5,000 Wuling Sunshine, a barebones minivan wildly popular in rural areas, and luxurious Cadillacs that sell for well over \$100,000. Most of the GM cars sold in China are produced in China, with a few imports from the U.S. Shanghai GM has plants all over China, and recently opened a \$1.2 billion Cadillac plant, which will lower the cost of Cadillacs in China and increase sales. The company plans to roll out 13 new vehicles in China in 2016, and before the end of the decade plans a total of 60 new and refreshed models in the country.²⁹

Shanghai GM has succeeded in part because of GM's willingness to contribute capital and share technology with SAIC. As part of their JV agreement, GM invested in a joint research and development center called Pan-Asia Technical Automotive Center (PATAC). The team at PATAC, composed of mostly local engineering talent and a few expatriates, has been responsible for designing new Buick, Chevrolet, and Cadillac models for the Chinese market and other regional markets. In 2009, just after it went through bankruptcy proceedings, GM agreed to sell 1 percent of the JV to SAIC for \$84 million, giving its Chinese partner majority ownership (51%) in the JV and theoretically the ability to make all decisions for the venture independently.

Although such an arrangement would appear to make GM's China operations vulnerable, the relationship is still considered one of the most congenial in the industry. One Shanghai-based GM executive said of the venture, "This is more than a partnership; it's a marriage. A partnership maybe expires at some point, but a marriage is for life...We are truly committed and we think SAIC is as well."³⁰ General Motors has perhaps made a lot of concessions because China has become its primary market. Steven J. Girsky, now a member of GM's board of directions, said back in 2010 that "China's a big piece of the value of the company...And since we pull cash out of China, it helps fund investments in other parts of the company as well."³¹

At this point, GM does not appear concerned that SAIC will become a major competitor. As mentioned earlier, most of the cars built at SAIC factories carry the logos of GM brands while its own brands have done very poorly. This would explain why GM continues to oblige the Chinese government when it pressures GM to share technology and intellectual property with SAIC. GM's calculus is unlikely to change as long as SAIC's profitability hinges on the success of GM brands in China and its business model remains unchanged.

In contrast to its Detroit rival, Ford Motors was late to the Chinese market. In 2001, Ford formed its first 50-50 JV in China with Chang'an Motors in Chongqing, a city located in China's interior. In 2006, Japan's Mazda purchased a 15 percent stake in the JV, a partnership which lasted until 2012, when the American and Japanese companies decided to part ways. Today, each company has a separate JV with Chang'an Motors. Although it has taken nearly a decade for Ford's operations in China to take root, the company's China sales started to take off after it split from Mazda.

From 2012-2014, the Ford Focus was the best-selling car in China in any segment (391,781 units in 2014). The accumulated sales of the Focus in China has exceeded 2 million units.³² In 2015, the company's China sales exceeded 1 million units. Ford has announced that it plans to continue expanding capacity and sales channels in China, particularly for its Lincoln premium brand. The 806,000 cars produced by Chang'an Ford in 2015 accounted for more than 30% of Chang'an Motors total production and an even larger share of its profits. For this reason, Chang'an Motors is likely to defend Ford's interests in China.

Chrysler, now owned and operated by Fiat Chrysler Holdings in the United Kingdom, has been the slowest of the Big Three to gain traction in China. Just last year, Fiat Chrysler started production of Jeep Renegades with its JV partner Guangzhou Automobile Corporation. By 2018, the JV hopes to sell 850,000 units, compared with the 130,000 units it sold in 2013. Fiat Chrysler also hopes to export more models to China in the next few years, including the Wrangler, the Grand Cherokee, the Grand Wagoneer, the Town & Country, and the Grand Voyager.³³ These models have probably been selected because the SUV and minivan market are growing rapidly in China; however, Fiat Chrysler will have to invest heavily in marketing their brands to an increasingly demanding and savvy consumer base.

Although the 13th FYP emphasizes the NEV market, the Chinese government may still decide to boost sales of gasoline-powered vehicles if economic growth remains sluggish. During the recent global financial crisis, for example, the government offered a variety of incentives in the 2009 Auto Industry Adjustment and Stimulus Plan, including tax and subsidy measures to stimulate auto sales. Such measures were effective in increasing annual sales volumes in 2009 and 2010. If such measures were adopted during the 13th FYP, GM and Ford's JVs in China could see their sales grow further.

Tesla Motors has been the latest American automaker to enter the Chinese market. Although Tesla Model S exports have been modest (less than 5,000 units) because of their high sticker price, the company is in discussions with the Chinese officials about producing its \$76,000 and up vehicles cars in China. Tesla CEO Elon Musk has said that local production could cut sales prices by one-third.³⁴ Tesla will need to find a local partner because the Chinese government still prohibits wholly-foreign owned operations in vehicle assembly. It will be interesting to see which of China's firms will be selected by Chinese officials to work with America's leading all-electric car producer. Until it can get its costs way down, Tesla is unlikely to gain a foothold in China.

Shifting Patterns of U.S.-China Automotive Trade

The growing popularity of American brands in China has actually led to growing exports of American-made cars to China. U.S. vehicle exports to China have grown from 25,065 units (\$636 million) in 2009 to 307,425 units (\$9.7 billion) in 2015.³⁵ This trade surplus in assembled vehicles was an unusual bright spot as the overall merchandise trade deficit with China ballooned to new high of \$365.7 billion last year.

Meanwhile, vehicle imports from China have only begun in earnest in 2015. In addition to Volvo, GM has also started importing small numbers of its Chinese-made Buick Envision SUV, which infuriated the United Auto Workers who objected to the decision. Data analysis firm, IHS Automotive, forecasts that the Buick range will shift to seeing about 65 percent of its U.S. sales imported from China, South Korea and Europe.³⁶ This is largely because China is the largest market for Buicks while the brand's market share in the U.S. is shrinking. In contrast, Chevrolet sales in the U.S. are likely to stay strong enough to support domestic manufacturing.

Although the trend of importing Chinese-made cars to the U.S. will increase in the future, IHS Automotive predicts that Chinese-produced vehicles will comprise at most 1% of sales in the U.S. by 2021.³⁷ And most of these imports will probably come from the JV operations of American automakers rather than from China's independent automakers. Geely's Volvo models are currently an exception, but then again Volvo has a long-established reputation in the U.S. Not only are the majority of Chinese firms unfamiliar with American consumer preferences, they have also discovered that their low-cost cars face significant and costly hurdles as they strive to pass American crash test standards and comply with stringent safety regulations.

In order to succeed in the U.S., Chinese automakers would have to commit to designing models specifically for the American market rather than exporting excess capacity from their Chinese factories. Chinese vehicle exports as a whole are very modest, totaling 728,200 units in 2015, down 20% from the previous year. Meanwhile, China imported 991,200 units.³⁸ Future export growth from China will likely be to other emerging markets where vehicle safety standards are similar to those in China and consumers are price-sensitive.

Growing U.S.-China Trade Deficit in Auto Parts and Impact on American Jobs

Beginning in the late 1990s, American and other international parts suppliers opened manufacturing operations in China in order to better serve the international automakers like Ford and GM and their JV operations in China. Unlike in vehicle assembly, the Chinese government did not force auto parts suppliers to participate in JVs to enter the Chinese market. Without the cumbersome bureaucratic hurdles associated with establishing a JV, parts suppliers were able to get their factories up and running more quickly. Once established in China, parts suppliers then began using their expanding capacity in China to supply parts to assembly plants worldwide and in the aftermarket. Michigan-based Visteon, for example, has 23 manufacturing, technical and customer centers in China and its Asia-Pacific regional headquarters located in

Shanghai. This trend in offshoring has coincided with ever increasing imports to the U.S. of Chinese-made auto parts.

Auto parts imports from China have grown from \$7.2 billion in 2009 to \$18.0 billion in 2014. China now accounts for about 13% of auto parts imports, second only to Mexico, which accounts for 34% of imports (\$46.6 billion in 2014). In contrast, auto parts exports to China in 2014 totaled only \$2.5 billion in 2014.³⁹ The growth of parts imports has left the U.S. with a growing deficit with the world in overall trade in cars and parts.

Thus, even though American vehicle sales hit an all-time record of 17,470,659 units in 2015, these vehicles are increasingly built with auto parts produced abroad. This trend has been detrimental to American manufacturing jobs in the sector. According to a recent Wall Street Journal article, “In 2014, employment at car-parts makers averaged about 537,000, down 36% from 2000. At manufacturers of completed vehicles, employment fell 32% over that period, despite the recent boom in output—a decline due in part to productivity improvements including automation.”⁴⁰

While imports of Chinese-made auto parts is contributing to this downward trend in auto-related employment, it is important to note that the majority of outsourcing in both assembly and parts manufacturing has been to Canada and Mexico – a result of the North American Free Trade Agreement of the 1990s. According to a prediction made in *Knowledge@Wharton*, the online business school journal of Wharton Business School, “by 2020, almost 25% of all North American vehicle production will take place in Mexico, compared with only 10% in Canada and 65% in the United States.”⁴¹

IV. Recommendations for Congressional Action

Unfortunately, the interests of automakers and autoworkers are not always aligned. As American automakers and parts suppliers look to increase productivity and quality while controlling costs, they are increasingly turning to automation and offshoring. Neither trend bodes well for manufacturing jobs in the U.S. This section offers several policy recommendations for Congressional action to support the interests of American automakers, parts suppliers, and autoworkers.

Support for American Firms Operating in China

Congress should continue to monitor and support the export of U.S.-produced vehicles and auto parts to China by making sure that the Chinese government does not enact unfair trade barriers that violate World Trade Organization (WTO) rules. Back in 2008, the WTO determined that China’s regulations on auto parts were inconsistent with its WTO obligations.⁴² In 2014, the WTO once again sided with the U.S. in a dispute against China over duties on imported American vehicles. While these types of battles have yielded few if any tangible benefits for American companies and workers, they do keep the pressure on the Chinese government to stay WTO-compliant.

Support for the Development and Deployment of New Automotive Technologies in the U.S.

Congress should work with the next administration on legislation that raises fuel and emissions standards for cars sold in the U.S. Pushing for higher standards would not only reduce carbon emissions and other air pollutants, but have the potential to improve the competitiveness of American cars abroad. Such cars will be welcome in many markets where governments and consumers are concerned about pollution and climate change.

Congress should increase support the development, production, and adoption of plug-in all-EVs in the United States. Government support could take the form of R&D tax credits for the development of electric cars (particularly in the area of batteries), incentives for the building out of fast-charging infrastructure across the U.S., and purchase rebates and tax breaks for American consumers of EVs. With a strong base in the U.S., American automakers that produce EVs and their suppliers could become the leaders in this growing segment of the global auto market. In 2015, China with extensive government support surpassed the U.S. as the largest market for EVs with vehicles largely produced domestically.

Congress should consider working with the next administration to set national safety standards for fully autonomous (driverless) vehicles, which are likely to become a major segment of market in the coming decade. While GM and Ford are working on semi-autonomous technologies, American technology firm Google want to transform the automotive industry by making car ownership obsolete by enabling a convenient smart phone-enabled mobility service that can pick and drop off customers on demand. There is room for cooperation between American carmakers and tech firms. After all, Google has no expertise in car production. Widespread adoption of driverless car platforms will require close partnership and coordination between firms in this space and the government to establish the national safety and transportation standards required to put such cars on the road. The U.S. cannot afford to let China become the leader in electric cars or vehicle connectivity.

Support for Displaced American Autoworkers

Rather than stemming the import of auto parts to address unemployment, Congress should instead focus its efforts funding educational opportunities and new skills training for unemployed autoworkers. In the long run, these people cannot afford to wait until elusive auto manufacturing jobs – which are likely to be poorly paid – come back to the United States. They are better off going back to school now to learn new skills that can be transferred to new trades and services that reflect the America’s increasingly knowledge-based economy.

We simply cannot afford to leave behind the great numbers of Americans (roughly 70%) who do not have bachelor’s degrees but cannot afford the rising cost of tertiary education. According to the National Center for Education Statistics, young adults with a bachelor's degree earn more than twice as much as those without a high school diploma or its equivalent and 62 percent more than young adult high school completers.⁴³

¹ The perspectives presented in this testimony draw from Crystal Chang (2011), *Stumbling toward Capitalism: The State, Global Production Networks, and the Unexpected Emergence of China's Independent Auto Industry* (Doctoral Dissertation), which can be retrieved from the Proquest UCB Dissertations Database; and Crystal Chang (2013), "Center-Local Politics and the Limits of China's Production Model: Why China's Innovation Challenge is Overstated," in John Zysman and Dan Breznitz (eds.), *The Third Globalization: Can Wealthy Nations Stay Rich in the Twenty-First Century?* New York, NY: Oxford University Press.

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