



China's Hunger for U.S. Planes and Cars: Assessing the Risks

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The U.S. trade deficit in goods fell to a four-year low in 2013. The U.S. bilateral deficit with China, though, hit a new high of \$318 billion. China accounted for 46 percent of the total U.S. deficit, up from 43 percent in 2012. Of the \$440 billion in U.S. imports from China, about half were computers, electronics, and electrical products, followed by textiles & apparel and basic industrial materials.

But the past year also saw record U.S. exports to China. At \$122 billion, they helped to moderate the growing trade imbalance. The U.S. trade deficit with China increased by \$3 billion, compared to an average annual increase of \$29 billion in the previous three years.

The driving force behind U.S. exports was transportation equipment. These shipments made up only one-fifth of U.S. exports to China, but two-thirds of the growth in those exports. That trend began during the global financial crisis (see figure 1). Between 2009 and 2013, China nearly doubled its share of U.S. transportation equipment purchases. At this rate, it will soon be the second-leading destination for these goods (see table 1).

Transportation equipment exports were dominated by aerospace (56 percent) and automotive (37 percent) goods.* These two industries face some of the same risks and opportunities in the world's second-largest economy. As China becomes more affluent and urbanized, ordinary Chinese are driving more cars and traveling more by air. U.S. businesses in these segments – notably Boeing Co. (Boeing), General Motors Co. (GM), and Ford Motor Co. (Ford) – are increasingly relying on China to boost sales. At the same time, China is

Key Points

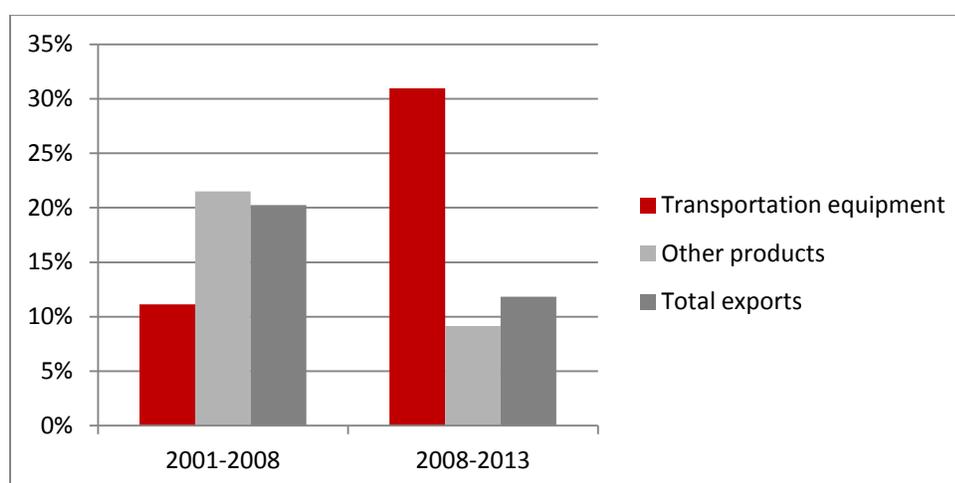
- The U.S. trade deficit with China continues to grow but at a slower rate. Part of the reason is the record U.S. exports to China, which reached \$122 billion in 2013.
- The most dynamic U.S. export has been transportation equipment. Since the global financial crisis, U.S. automotive and aerospace companies have come to rely more heavily on the China market. For example, China doubled its share of Boeing revenues in 2008-2013. One in three GM vehicles is sold in China.
- China presents tremendous potential but future demand could be affected by pollution, traffic bottlenecks, and other factors. U.S. companies must also contend with China's industrial policy, which tilts the playing field toward domestic industry by conditioning market access and subsidizing the cost of domestic production.
- Manufacturing activity is migrating to China. The problem is mitigated to a degree by strong exports and sales growth. Yet in the long run, technology transfer and off-shoring could erode U.S. competitiveness and take business away from U.S. plants.

* Calculations for transportation are based on NAICS code 336. Calculations for automobiles are based on NAICS codes 336111, 336120, 336211, 336212, 336213, 336214, 336310, 336320, 336330, 336340, 336350, 336360, 336370, 336390. Calculations for aerospace are based on NAICS codes 336411, 336412, 336413, 336415, 336419, 33641X.

suffering from infrastructure constraints, pollution, and broader economic imbalances. The Chinese government's response has often been unpredictable and inadequate. Given these factors, can China's demand for U.S. planes and cars be sustained?

Unfortunately for U.S. exporters, China has adopted policies to nurture domestic aerospace and automotive producers, which it considers "pillar" industries. These policies include restrictions on foreign investment, import barriers, and other forms of discrimination against foreign businesses. For the most part, China's own companies in these sectors are not yet competitive with U.S. firms, even though China has acquired significant foreign technology. Many foreign-branded aircraft and cars are now produced in China and Chinese producers have been studying their technological advantages for decades. Can U.S. aerospace and automotive companies produce and sell in China without eroding their long-term competitiveness? Is there a net benefit for U.S. industry?

Figure 1: Growth in U.S. Exports to China: Transportation Equipment vs. the Rest (Compound annual growth rate, %)



Source: U.S. Census via International Trade Administration.

Table 1: Top-10 Destinations for U.S. Transportation Equipment Exports, 2012-2013

	2012			2013			Change 2012-2013	
	Rank	Value (US\$ mn)	Share (%)	Rank	Value (US\$ mn)	Share (%)	Year-on-year growth (%)	Change in share (%)
Canada	1	61,596	24.8%	1	64,487	24.4%	4.7%	-0.4%
Mexico	2	27,868	11.2%	2	30,512	11.6%	9.5%	0.3%
China	3	15,719	6.3%	3	23,387	8.9%	48.8%	2.5%
Germany	4	13,132	5.3%	4	12,132	4.6%	-7.6%	-0.7%
United Kingdom	7	9,116	3.7%	5	10,867	4.1%	19.2%	0.4%
United Arab Emirates	6	10,509	4.2%	6	9,375	3.6%	-10.8%	-0.7%
Japan	5	10,846	4.4%	7	9,190	3.5%	-15.3%	-0.9%
France	8	8,609	3.5%	8	9,143	3.5%	6.2%	0.0%
Saudi Arabia	9	7,687	3.1%	9	8,060	3.1%	4.9%	0.0%
Brazil	10	7,641	3.1%	10	6,943	2.6%	-9.1%	-0.5%
RoW		75,159	30.3%		79,831	30.2%	6.2%	-0.1%
Total exports		247,881			263,928		6.5%	

Source: U.S. Census via International Trade Administration.

China's Demand for Planes and Automobiles

Greater Reliance on China's Market

The U.S. aerospace and automotive industries have eyed China's market as early as the 1990s, and focused even more intently since China joined the World Trade Organization (WTO) in 2001. But the reliance on China to expand overall business really began after the global financial crisis. In the aerospace sector, Boeing's sales in China more than tripled from 2008 to 2013, raising China's share of Boeing's global revenues from 5.1 percent to 12.2 percent (see table 2). Only Boeing's revenues in the Middle East grew faster. The U.S. sales share of Boeing revenue, on the other hand, declined precipitously, from 61 percent to 43.4 percent. In parallel, Boeing has become more profitable: operating margins averaged 8.7 percent in 2011-2013, compared to 6.7 percent in 2006-2008.¹

Boeing's dependence on China keeps deepening. Out of the record 648 planes that the aircraft maker delivered last year, 143 went to China. Over half of the 2,000 commercial planes in China's skies carry Boeing's trademark. In a market outlook report released last September, Boeing predicted that China will surpass the United States as the company's largest market by 2020. The Seattle-based company also forecast that, over the next two decades, China would need 5,580 new aircraft, triple its current fleet.²

Table 2: Boeing's Consolidated Revenues by Region, 2008-2013
(\$ millions)

<i>Value (US\$ millions)</i>	2008	2009	2010	2011	2012	2013	Compound annual growth (%) 2008-2013
Rest of Asia	\$ 7,913	\$ 7,536	\$ 7,288	\$ 7,438	\$10,390	\$12,200	9.0%
China	\$ 3,109	\$ 4,888	\$ 2,404	\$ 4,779	\$ 6,086	\$10,555	27.7%
Europe	\$ 5,992	\$ 7,516	\$ 7,872	\$ 9,850	\$10,269	\$10,622	12.1%
Middle East	\$ 2,568	\$ 5,338	\$ 3,685	\$ 5,477	\$10,285	\$ 9,165	29.0%
Oceania	\$ 989	\$ 1,447	\$ 1,707	\$ 3,067	\$ 2,043	\$ 1,657	10.9%
Canada	\$ 1,849	\$ 493	\$ 612	\$ 618	\$ 586	\$ 1,486	-4.3%
Africa	\$ 406	\$ 602	\$ 956	\$ 1,759	\$ 1,282	\$ 621	8.9%
Latin America	\$ 1,656	\$ 963	\$ 930	\$ 1,356	\$ 3,555	\$ 2,725	10.5%
Non-US Revenue	\$23,777	\$28,783	\$26,159	\$34,344	\$44,496	\$49,031	15.6%
US Revenue	\$37,132	\$39,498	\$38,147	\$34,391	\$37,202	\$37,592	0.2%
Total	\$60,909	\$68,281	\$64,306	\$68,735	\$81,698	\$86,623	7.3%
							Change in share (%) 2008-2013
<i>Composition (%)</i>	2008	2009	2010	2011	2012	2013	2008-2013
Rest of Asia	13.0%	11.0%	11.3%	10.8%	12.7%	14.1%	1.1%
China	5.1%	7.2%	3.7%	7.0%	7.4%	12.2%	7.1%
Europe	9.8%	11.0%	12.2%	14.3%	12.6%	12.3%	2.4%
Middle East	4.2%	7.8%	5.7%	8.0%	12.6%	10.6%	6.4%
Oceania	1.6%	2.1%	2.7%	4.5%	2.5%	1.9%	0.3%
Canada	3.0%	0.7%	1.0%	0.9%	0.7%	1.7%	-1.3%
Africa	0.7%	0.9%	1.5%	2.6%	1.6%	0.7%	0.1%
Latin America	2.7%	1.4%	1.4%	2.0%	4.4%	3.1%	0.4%
Non-US	39.0%	42.2%	40.7%	50.0%	54.5%	56.6%	17.6%
US	61.0%	57.8%	59.3%	50.0%	45.5%	43.4%	-17.6%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	

Source: Boeing Annual Reports 2010, 2013.

No less impressive are the tectonic shifts that have occurred in the automotive sector. China overtook Japan in 2009 as the largest automotive producer, and the United States in 2011 as the world's largest auto market. The U.S. auto industry, meanwhile, dug itself out of the worst crisis since the Great Depression – GM and Chrysler Group LLC (Chrysler) received \$62 billion in federal bailouts as part of a government-administered bankruptcy,³ while Ford underwent painful restructuring. Last year, Detroit finally appeared to turn a corner. In December, the federal government sold the remainder of the stake it acquired in GM during the bailout. President Obama noted last December that Detroit's Big-Three were again profitable, and had created 372,000 new jobs since 2009.⁴ Weeks later, Vice President Biden touted the industry's resurgence at the Detroit Auto Show.⁵

Several factors explain Detroit's recovery. For one, the U.S. auto industry is becoming more competitive due to lower energy prices, reduced wages, and streamlined operations. That has helped U.S. auto exports surge from \$57 billion in 2009 to \$139 billion in 2013.⁶ Once concentrated within the three NAFTA nations, half of U.S. auto exports now go to other foreign markets.⁷ U.S. consumers are also buying cars again. Ford and GM called 2013 their best year for domestic auto sales in at least five years, reporting double-digit annual gains, while Chrysler reported its strongest year since 2007.⁸

Still, the growing reliance on China's auto market is unmistakable. Although a mere 8 percent of U.S. auto exports went to China last year, those exports grew six-fold from 2009 to 2013, and by 47.4 percent in 2012-2013, outpacing other markets.⁹ Of far greater importance to Ford and GM are the cars they produce in China. These China subsidiaries, all joint ventures (JVs) with Chinese firms, have achieved record sales growth over the past year. Ford China sold 935,813 wholesale vehicles in 2013, a 49 percent increase over 2012, and nearly three times Ford's total auto exports from the United States.^{10†} Its sales this February increased by 67 percent from the prior year.¹¹ GM's sales in China also set consecutive monthly records last fall, and hit an all-time high of 348,061 units in January 2014.¹² China now accounts for around 30 percent of all GM car sales worldwide.¹³

Faltering sales in Europe reinforce the importance of China's demand. GM has lost more than \$18 billion in Europe since 1999. The company last December announced a radical rethink of its Europe strategy, which included taking Chevrolet out of the mainstream market.^{14‡} Ford has done slightly better, but has been weighed down by Europe's ongoing recession, posting a fourth-quarter 2013 loss there of \$571 million. This January, Ford sold more vehicles in China than in Europe's 20 largest economies combined. Both Ford and GM are closing plants in the United Kingdom, Belgium, and Germany.¹⁵

Much of Detroit's hard-earned profits are now being re-invested in China. In April, GM announced a plan to spend \$11 billion through 2016, including four new plants by 2015, to double its total China capacity to five million units.¹⁶ Ford opened a new assembly plant with Jiangling Motors Corp. in June, and is building a state-of-the-art assembly plant in Hangzhou with its Chang'an-Ford-Mazda JV. The Hangzhou project would bring Ford's cumulative investment in China since 2006 to \$4.9 billion.¹⁷

† The cars that Ford and GM produce in China through their joint venture arrangements are not counted as U.S. exports.

‡ General Motors stated in a press release that, beginning in 2016, it would compete in Europe's volume markets primarily under its Opel and Vauxhall brands. The company's "Chevrolet brand will no longer have a mainstream presence in Western and Eastern Europe, largely due to a challenging business model and the difficult economic situation in Europe." Chevrolet would focus only on "select iconic vehicles," such as the Corvette. "GM Strengthens Its European Brand Strategy" (Detroit, MI: General Motors, December 5, 2013). <https://media.gm.com/media/us/en/gm/news.detail.html/content/Pages/news/us/en/2013/Dec/1205-chevy-europe.html>.

Roadblocks for Future Demand

There are compelling reasons why Detroit and Seattle might continue to bet on China. For starters, there is the country's growth potential. With the world's largest population, China still ranks 93rd in the world in per capita income, and just over half of the population lives in cities (2012 data).¹⁸ Income gaps between tier-1 cities along the coast and tier-2 and tier-3 cities in the inland regions remain large. The economy grew by 7.7 percent in 2013, well above the world average. Household consumption, though low as a share of China's GDP, is rising faster than in most major economies. These trends suggest that ordinary Chinese could continue to buy cars and plane tickets at a rapid rate.

Airline passenger traffic in China increased at a compound annual rate of 14 percent in 2000-2013, compared to 8 percent for other forms of transport.¹⁹ Already by 2017, one in four new air travelers worldwide will be in China.²⁰ And yet, only 1 percent of China's passengers travel by air.²¹ China in 2012 logged 236 airline passengers per 1,000 residents – compared to 1,115 in Europe and 2,346 in the United States (where the average person flies multiple times per year).²²

The automotive sector tells a similar story. Last year, China broke the single-year world record for car sales, with 21.9 million units sold.²³ Sales rose 13.9 percent year-on-year, almost twice the U.S. rate.²⁴ Still, China has less than 100 motor vehicles per 1,000 people, compared to around 800 in the United States.²⁵ SUV sales increased by 49 percent last year – a sign that wealthier Chinese are upgrading from small sedans.²⁶

It would be naïve, however, to rule out the risks to future consumption. One factor is short-term volatility. Annual growth in air passenger traffic has seen ups and downs, and has slowed since 2010, along with the rest of China's economy (see figure 2). Turnover of air freight – which multiplies the number of tons transported times the distance traveled – has actually declined of late, likely owing to the sluggishness of China's goods exports.²⁷ Annual sales of cars have been even more volatile. Like other durable goods, a car is a big-ticket item that households quickly forego when their incomes decline. In 2011, for example, vehicle sales in China grew by just 2.5 percent, the slowest pace of growth since the nation's car culture blossomed at the turn of the century.²⁸ During the global financial crisis, the government used generous subsidies to induce consumption, but such a policy cannot be relied on regularly.

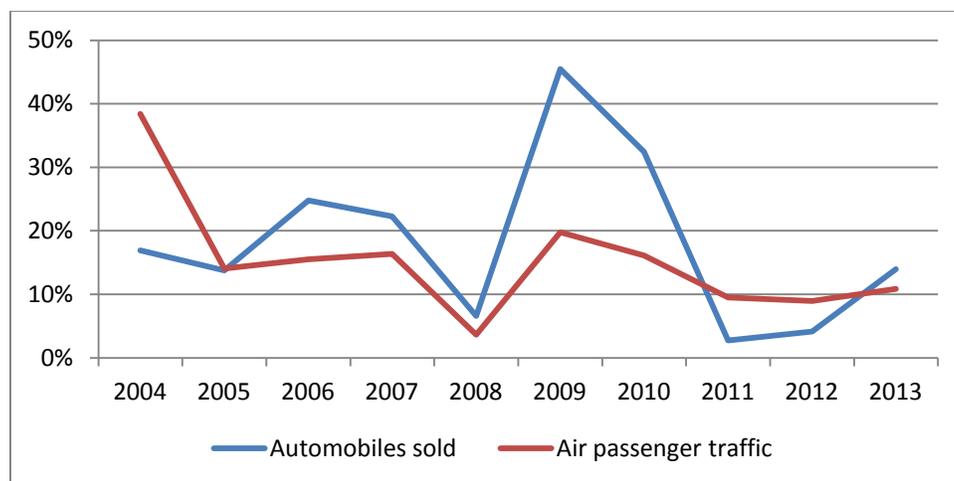
The bigger risks in China's market are structural – foremost, the alarming levels of pollution. China today has some of the worst air quality in the world. Beijing's reading of airborne particulates in mid-February was 11 times the recommended exposure limit set by the World Health Organization.²⁹ In April 2013, a British medical journal published new data indicating that 1.2 million people died premature deaths in China in 2010 due to outdoor air pollution, roughly 40 percent of the global total.³⁰ Although coal-fired power plants are the worst polluters, there is a growing realization that vehicles are also to blame; for example, *Shanghai Daily* editor Wan Lixin has criticized Chinese officials for downplaying the role of auto emissions in China's air pollution crisis.³¹

Beginning with the 11th Five-Year Plan (2006-2010), Beijing has gradually become more responsive to the pollution problem, primarily through investments in energy efficiency, clean coal, gas, and renewable energy. Some of these policies provide opportunities to market next-generation transportation equipment. For instance, the Energy Saving and New Energy Vehicles (NEVs) Industry Development Program (2012-2020), published in July 2012, aims for cumulative production of five million units of NEVs in China by 2020.³² China

is also retiring older planes prematurely in favor of more fuel-efficient jets, such as Boeing's 737 Max.³³

But the manner in which the government is responding to pollution also poses threats to the transport industry. One problem is the unequal distribution of costs. In the automotive sector, China has tried to reduce car emissions by imposing tougher emissions standards, yet the hammer has fallen more heavily on carmakers than on gasoline producers. China's state-owned oligopoly of vertically integrated oil companies, which source, refine, and distribute petroleum products, has been placed under much less pressure to improve fuel quality by removing harmful components. While carmakers introduced better vehicle engine technology in 2010, no date was ever announced for matching fuels to come on the market. Subpar fuel thus continues to pollute the air. According to the European Chamber, the gap between emissions standards and fuel quality in China continues to widen.³⁴

Figure 2: Annual Growth of Air Passenger Traffic and Cars Sold in China (year-on-year, %)



Source: China Civil Aviation Administration, via CEIC data.⁵

A different sort of risk is that Beijing will follow in the footsteps of Europe, by combining aggressive fuel taxation with large-scale spending on public transport. In December 2008, the Ministry of Finance raised the fuel tax on gasoline, from RMB 0.2 to RMB 1.0 per liter.³⁵ In September 2012, the country's airlines raised fuel surcharges for domestic flights.³⁶ These measures act to discourage air and car travel.

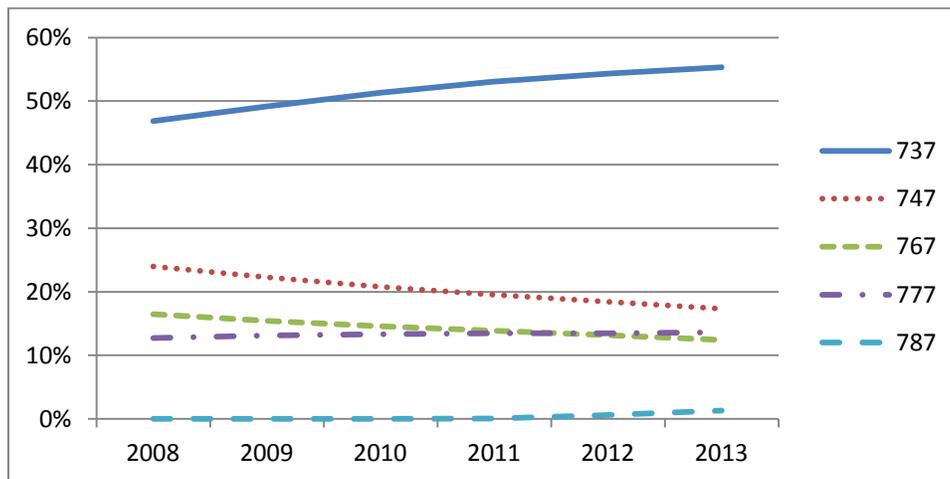
In parallel, China is unveiling some of the world's most ambitious blueprints for metro and rail systems, which, for the same person-kilometer, generate only one-tenth of the emissions from road traffic.³⁷ At 12,000 kilometers, China already boasts half the world's railroad track, and the government intends to spend \$100 billion a year to add another 6,000 kilometers by 2020. Most of the added track will extend the high-speed network: studies show that Chinese airlines abandon routes shorter than 300 miles when there is a competing high-speed rail line.³⁸

⁵ CEIC Data's China Premium Database offers information on the performance of various sectors, industries, and regions in China. Its data is primarily drawn from Chinese government institutions. It is a product of ISI Emerging Markets, a company that delivers electronic information products to institutional customers.

If rail is the future of Chinese transport, U.S. industry faces a stiff test. Total U.S.-China trade in railroad rolling stock, for example, was no more than \$337 million last year, with the United States incurring a deficit of \$165 million.³⁹ U.S. firms would go up against seasoned competitors from Japan, Canada, and Germany to land contracts in the China market. What's more, China's rail system is a monopoly run by China's Railway Ministry, and has frequently been accused of corruption.⁴⁰ Intellectual property theft would also be a concern. The German firm Siemens partnered with a Chinese firm to build the Beijing-Tianjin high-speed railway in 2005, but after transferring significant technology and know-how, it was excluded by the Ministry of Transportation from subsequent projects.⁴¹

Finally, there is the issue of traffic bottlenecks. Confronted with severe congestion on their roads, municipal governments are taking matters into their own hands. In December, Tianjin announced an auction and lottery system to distribute a limited number of car licenses, making it the sixth Chinese city to use such measures to ease traffic and combat air pollution.⁴² Some cities are also placing limits on actual car purchases.⁴³

Figure 3: Breakdown of Boeing's Cumulative Deliveries by Model, 2008-2013 (share, %)



Source: Boeing Annual Report 2010, 2013.

Meanwhile, the number of flights in China has increased at twice the rate of new flight routes over the past decade.⁴⁴ The result has been a lack of flights between smaller cities, and extremely congested air traffic among the country's largest cities, especially Beijing and Shanghai. Part of the solution is to optimize the use of airspace; China's air traffic management is fragmented and not nationally integrated.⁴⁵ For Boeing, however, this situation has created an uncomfortable dilemma. The types of planes that Chinese airlines are ordering for domestic routes are steadily increasing in size, to ferry more passengers between congested airports. Although Boeing has responded by marketing the 787-10 wide-body, it is doubtful that using such heavy, long-range planes for short routes can be done without raising per-seat operating costs.⁴⁶ The alternative for Boeing is to provide planes that connect tier-2 and tier-3 cities. But these routes suffer from a shortage of airports and pilots. And because China's airlines are focusing on domestic routes, Boeing's order books are filled with the smaller 737 model (see figure 3). Boeing is thus less able to leverage its advantage in larger planes, like the 747.

China's Industrial Policy in Aerospace

Industrial policy is a hallmark of China's economy. Many ministries retain direct influence over companies, blurring the line between operational and regulatory functions. The National Development and Reform Commission (NDRC), the successor of the Soviet-era State Planning Commission, is a powerful body that designs long-term industry plans, sets prices, and approves important projects and transactions. State ownership is pervasive, in tandem with market barriers for private and foreign firms. State influence is particularly salient in the banking sector, providing the government with a means to expand or tighten credit in line with policy goals. The government has also kept a managed currency to reduce the cost of exports and accumulate dollar reserves.** Further aiding industrial production is subsidized energy, lax enforcement of environmental standards, and restricted bargaining power for workers.

The Chinese government intends to develop an indigenous aerospace industry to rival those of Europe and the United States. In June 1993, it founded China Aviation Industry Corp. (AVIC), a state-owned enterprise under the auspices of the Ministry of Aviation and Aerospace Industry. AVIC focused on the development of both military and civilian aircraft. Commercial Aviation Corp. of China (COMAC), a dedicated civilian aircraft maker, was subsequently established in May 2008 by AVIC and a consortium of other state-owned enterprises, including China's largest steelmaker Baosteel. Aerospace is one of 16 "megaprojects" in the State Council's Medium and Long-Term Plan for Science and Technology (2006-2020), and is designated as a "strategic emerging industry" in the 12th Five-Year Plan (2011-2015). The sectors included in these plans receive preferential loans and other government support.

For now, China's aerospace industry is more of a "paper airplane". COMAC has signed an agreement with United Aircraft Corp., a Russian aircraft maker, to jointly design a long-range, wide-body plane capable of competing with the Boeing 787, but this is a distant prospect.⁴⁷ The current focus is on the C919, a regional 150-seat single-aisle aircraft designed to rival the Boeing 737. COMAC announced last August that the maiden flight of the C919 would be pushed back from 2014 until year-end 2015, meaning it will go into service in 2017 at the earliest.⁴⁸ The announcement added to COMAC's notoriety for poor supplier management and repeated delays. COMAC has also struggled to get certification for the C919 from the U.S. Federal Aviation Administration, which is reluctant to invest the resources and manpower to accredit the plane, but is also wary to let the Civil Aviation Administration of China (CAAC) do the work, because it is certifying a large jet for the first time.⁴⁹

In any case, the C919 has been good for business in the U.S. aerospace industry, which is a strategic node in the global supply chain. Some of the plane's most lucrative components are sourced from U.S. suppliers, such as United Technologies, Rockwell Collins, and Eaton Aerospace.⁵⁰ Indeed, most commercial planes operating in China, including Airbus, rely heavily on U.S. components, notably GE's world-leading jet engines.

China's aerospace industry, however, may someday pose a competitive threat. One advantage China has is that the companies buying COMAC aircraft – airlines and leasing

** The renminbi has gained over 30 percent in real terms against the dollar since 2008. The daily trading band was widened to 2 percent in March of this year. China's currency rapidly depreciated in February, suggesting that currency appreciation is not inevitable. Reuters, "China Widens Yuan Trading Band to 2% from 1%," March 15, 2013. <http://www.cnbc.com/id/101497299>; Roger Yu Du, "Renminbi Depreciation Poses Risk to Chinese Economy," *Global Risk Insights*, March 6, 2014. <http://globalriskinsights.com/2014/03/06/renminbi-depreciation-poses-risk-to-chinese-economy/>.

companies – are essentially state-owned oligopolies. State-owned China Eastern, China Southern, and Air China combined constitute about three-quarters of China’s air passengers and operate two of every three Airbuses there. China recently approved its first new carrier since 2007 in a bid to shake up the industry;⁵¹ yet it is likely that the new carriers will make only a small dent in the market. (COMAC is also the major shareholder of a regional carrier, Chengdu Airlines.⁵²) China’s state-owned banks, in turn, are aggressively developing aircraft leasing companies, led by China Everbright’s China Aircraft Leasing Co., CDB Leasing Co., and ICBC Leasing. These companies are beginning to buy planes on behalf of cash-strapped airlines that are reluctant to purchase their own (see table 3).⁵³ China’s leasing companies remain small by international comparison, but China’s banks have plenty of capital to spare, and Western banks are exiting the market due to the recession.^{††}

While China’s major airlines and leasing companies are keen to buy foreign planes,^{††} the Chinese government is also leveraging its control over these buyers to *induce* demand for China-branded planes. COMAC, which has not launched a single aircraft into the skies, has managed to get 400 orders for the C919 – equivalent to about 20 percent of China’s current commercial aircraft fleet. The only foreign buyer has been GE Capital, which also supplies jet engines to the C919.⁵⁴ COMAC’s agreements with British Airways and with Ryanair, an Irish low-cost airline, have not resulted in any actual orders.⁵⁵

Table 3: Airbus’s Deal Book in China: Airlines and Leasing Companies

		Orders	Deliveries	Operating
Aircraft	Total	990	774	997
	Top-3 airlines	590	507	653
	Other airlines	268	246	344
	Leasing companies	132	21	-
Share (%)	Top-3 airlines	59.6%	65.5%	65.5%
	Other airlines	27.1%	31.8%	34.5%
	Leasing companies	13.3%	2.7%	0.0%

Source: Airbus order book. <http://www.airbus.com/company/market/orders-deliveries/>

Inducing demand is not the only way in which the Chinese government is nurturing the domestic aerospace industry. To reduce competition for the ARJ21, the C919’s smaller sister, Beijing levies higher duties and value-added taxes on the imports of smaller planes. Moreover, as the European Chamber’s Aerospace Working Group has noted, aerospace companies in China are routinely forced into JVs, even though aerospace is a sector “encouraged” for foreign investment in China’s 2011 Investment Catalogue.⁵⁶ Airbus so far has been more willing to accede to these demands than Boeing. It opened a final assembly line in Tianjin in 2009, its first outside Europe, which has since assembled more than 100 Airbus 320s.⁵⁷ Airbus is now offering to build a completion center for its A330 in China as

^{††} American International Group Inc. in December 2012 sold an 80 percent stake in its aircraft leasing business, International Lease Finance Corp., to a Chinese consortium for \$4.23 billion. Dow Jones, “Chinese Investment in AIG’s ILFC Part of a Growing Trend,” December 10, 2012, via Factiva.

^{††} China in the past has leveraged its control over buyers as a tool in bilateral trade negotiations. For example, during (then) Premier Wen Jiabao’s first official visit to the United States in December 2003, Chinese state-owned enterprises signed deals to buy five Boeing 737 aircraft and \$3 billion worth of jet engines from General Electric (GE). In the fall of that year, the Bush White House had issued an import quota on Chinese textiles and imposed duties on Chinese-made televisions. The aircraft purchase, timed to coincide with Chinese purchases of U.S. soybeans, was viewed by many as a feel-good deliverable to allay U.S. concerns. *The Washington Times*, “China Seeks Currency with Wall Street; Leader Says More Trade, Not Tariffs, Is Answer,” December 9, 2013, via Factiva.

well.⁵⁸ Boeing, though, is beginning to give in to China's demands to source more parts locally; last year, AVIC Xi'an Aircraft Industry Co Ltd. became the first Chinese supplier to the Boeing 737 Max.⁵⁹

Although production offshoring and technology transfer in the aerospace sector is still early-stage, the increase in intellectual property (IP) theft incidents should raise alarm. In February 2010, a Chinese national, Dongfan "Greg" Chung, was sentenced to 15 years in prison for stealing critical trade secrets related to the space shuttle and the Delta IV rocket during his 18-year career at Boeing.⁶⁰ A report released last year by Mandiant, a cybersecurity firm, showed that aerospace has been the U.S. industry second-most compromised by cyber-attacks from APT1, a unit of the People's Liberation Army.⁶¹ A 2010 RAND report, commissioned by the USCC, illustrated the risks of IP theft and the potential of dual use of aerospace technologies by China's military.⁶²

China's Industrial Policy in the Automotive Sector

Restricted Market Access in China

To help develop its domestic auto industry, Beijing has for decades imposed conditions on foreign automakers seeking to sell cars in China. While some import tariffs were removed when China joined the WTO, many other barriers remain in place. One consequence is that the share of imports in China's domestic auto sales is only 5.4 percent, versus some 45 percent in the United States.⁶³ Since 2004, the NDRC has set targets for increasing the market share of indigenous Chinese-branded automakers.⁶⁴

In return for some limited market access, foreign automakers have settled for an uneven playing field. Ownership requirements are the most egregious market restriction. Foreign automakers must form JVs to produce cars in China, in which they are not permitted to own more than a 50 percent stake. (China was able to negotiate this into its WTO accession agreement.) According to the so-called "2+2" rule, they are also limited to two passenger and two commercial vehicle JVs, effectively preempting market expansion via mergers and acquisitions. Their JV partners, with few exceptions, are state-owned enterprises (SOEs).⁶⁵

At the same time, foreign cars are subject to complex certification and approval procedures. China has yet to accede to the United Nations' ECE 1958 Geneva Agreement, under which it would be compelled to conform to globally harmonized standards. Instead, China subjects new car models to complex and overlapping approval procedures administered by a variety of uncoordinated regulators (see table 4). The most burdensome is the China Compulsory Certification (CCC) system introduced in 2002. One effect of the CCC system is that it prevents the introduction of a greater variety of foreign vehicles into China due to the considerable cost and workload involved in going through the procedure. That provides a distorted incentive to produce older models in China, rather than importing the newest ones. Further, the CCC system puts foreign intellectual property at risk, because it forces importers to retest in Chinese laboratories automotive products and components already recognized in the foreign market.⁶⁶

Table 4: Example of Approvals Required for Heavy-Duty Trucks

Agency	Standard	Tests
Ministry of Industry and Information Technology (MIIT)	MIIT Gazette	Technical and fuel standards
Administration of Quality, Supervision, Inspection, and Quarantine (AQSIQ)	China Compulsory Certification	Separate set of technical and fuel standards
Ministry of Environmental Protection (MEP)	Phase III emissions	Emissions standards
Ministry of Transport (MOT)	Commercial Transportation Permit	Fuel consumption test
Ministry of Public Security (MPS)	GB7258	Vehicle safety standards

Source: "European Business in China Position Paper 2013/2014: Automotive Working Group" (Beijing, China: European Chamber, 2013), p.135-136.

So far, China's restrictive market access provisions have not done much for the competitiveness of its automakers. Chinese-branded cars command about one-third of their home market, well below the 50 percent target set by the government in 2004. Sales of domestic brands actually declined last year, counter to the rest of the market. The best-selling model overall was the Ford Focus, followed by the Volkswagen Lavida and the Buick Excel—all joint ventures rather than exclusively Chinese brands.⁶⁷ Due to a pervasive concern about IP transfers, only one foreign automaker, France's Peugeot, has developed models in China for the China market, through a wholly owned R&D center established in Shanghai in 2008.⁶⁸

Beijing's policies have also given rise to a skewed ownership structure among China's carmakers: at one extreme are inefficient SOEs that reap profits from their foreign-invested JVs but struggle to produce their own models; at the other are over a hundred carmakers promoted by local governments, many suffering from overcapacity and underutilization.⁶⁹ A 2009 Plan on Restructuring and Revitalizing the Auto Industry took small steps toward consolidating the industry.⁷⁰ The government has been eager to promote a handful of independent carmakers, led by Geely, which purchased the Swedish carmaker Volvo in 2010. But these brands rank outside of the top-five in the China market, and have had mixed success marketing their cheaper vehicles abroad.

Nonetheless, as with COMAC in the aerospace sector, China takes the long view. The country is a latecomer in a mature industry. Recent measures to promote new energy vehicles (NEVs) suggest that the government is looking to get a headstart on the next generation of cars. The European Union Chamber of Commerce in China^{§§} has complained that NEVs must be produced in China under a Chinese brand, i.e. a brand originally registered in China, in order to be eligible for subsidies. This in turn necessitates, as a prerequisite to the registration of the brand, that key technological know-how of the NEV is disclosed to the authorities. The Chamber argues that, "While at one level [NEVs] are meant to alleviate China's dependency on imported oil, on another level the [NEV Program] is a blueprint for the development of an indigenous (i.e. Chinese only), strategic, electric vehicles industry that might one day trump the dominant position of multinational original equipment manufacturers (OEM) in the field of internal combustion vehicles."⁷¹

^{§§} The European Union Chamber of Commerce in China was founded in 2000 by 51 member companies that shared a goal of establishing a common voice for the various business sectors of the European Union and European businesses operating in China. It is a members-driven, non-profit, fee-based organization with a core structure of 43 Working Groups and Fora representing European business in China. "About Us" (Beijing, China: European Union Chamber of Commerce in China). <http://www.euccc.com.cn/en/chamber-chapters-and-contact>.

Certain actors in China's auto sector have also resorted to foul play to steal intellectual property. Xiang Dongyu (aka Mike Yu), a Ford Motor product engineer from 1997-2007, copied 4,000 Ford documents onto an external hard drive, including sensitive data on car designs. He then proceeded to work at Beijing Automotive Company, where the stolen files were found on his laptop. Xiang pleaded guilty in U.S. federal court in November 2010.⁷² Shashan Du and Yu Qin, also Chinese nationals, were indicted on conspiracy, fraud and other charges in July 2010 for stealing hybrid vehicle trade secrets from General Motors and selling them to Chery Automobile, a leading Chinese carmaker.⁷³

The Fate of the Auto Industry Back Home

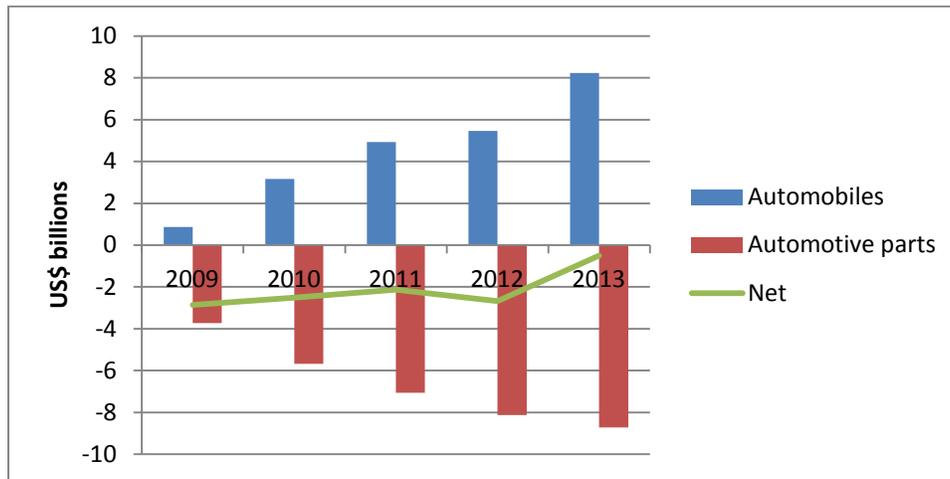
As long as strong economic growth continues, U.S. auto exports to China can be expected to rise, even as U.S. automakers invest in new plants in China. In the long run, though, the game may be more zero-sum. A closer look at U.S. automotive exports to China reveals some worrying patterns. While the United States has achieved a sizeable trade surplus with China in assembled cars, that surplus has been offset by a rising deficit in car parts (see figure 4). Of the more than 770,000 workers employed in the U.S. auto industry, more than half are in the auto parts sector, which in turn supports millions of positions in linked industries including the steel and plastics sectors.⁷⁴ U.S. auto parts industry employment fell by half from 2001 to 2010, as hundreds of factories closed — most in the Midwest — cutting more than 400,000 jobs.⁷⁵

Washington has taken some action to defend auto parts makers in the WTO (see table 5). The Bush administration joined other countries in a March 2006 case against China's domestic content clauses, which had forced foreign carmakers to source an inordinate share of parts locally as a condition for producing in China.^{***} The WTO ruled in favor of the plaintiffs in December 2008, and China complied by lifting the measures in September 2009. Eight months into his first term, President Obama also imposed duties on imports of Chinese tires that were unfairly subsidized and sold below cost. China challenged the duties but ultimately lost the case in September 2011.^{†††} And in the fall of 2012, the White House lodged a new WTO complaint against China challenging "illegal subsidies to auto and auto-parts exporters [that] amounted to at least \$1 billion between 2009 and 2011 [and] may benefit up to 60 percent of Chinese auto-parts exports."⁷⁶ (No dispute resolution panel has been formed in that case.)

^{***}The local content rules were spelled out in the Decree 125 on Import of Parts and Components for Complete Vehicles. They were effectively higher than the 40 percent set out in China's WTO obligations. Rosalyn Hsueh, *China's Regulatory State: A New Strategy for Globalization* (Ithaca: Cornell University Press, 2011).

^{†††} The duties covered more than 80 percent of U.S. auto exports to China, or about 92,000 vehicles. They added 15 percent to the price of an imported Jeep Wrangler or Detroit-made Jeep Grand Cherokee, 21.8 percent to a Buick Enclave and Cadillac CTS produced in Lansing, Mich., and 4.1 percent to an Acura TL sedan made by Honda of America Manufacturing Inc. in Marysville, Ohio. Tom Troy, "Obama to Fight China Tariffs on Cars: Dispute Is Centering on 2009 Bailout of Chrysler and GM," *Pittsburgh Post-Gazette*, July 5, 2012, via Factiva.

Figure 4: The U.S. Trade Balance with China in Autos and Automotive Parts



Note: Calculations for automobiles are based on NAICS codes 336111, 336120, 336211, 336212, 336213. Calculations for automotive parts are based on NAICS codes 336214, 336310, 336320, 336330, 336340, 336350, 336360, 336370, 336390.

Source: U.S. Census NAICS classification system.

Table 5: WTO Automotive Cases Involving the United States and China

<i>Cases Brought by China against the United States</i>				
No.	Title	Request	Panel /Appellate Report	Compliance Status
DS399	Measures Affecting Imports of Certain Passenger Vehicle and Light Truck	9/14/09	Panel: December 13, 2010; Appellate: September 5, 2011	The Panel rejected China's claims, and the Appellate Body upheld the Panel findings
<i>Cases Brought by the United States against China</i>				
DS340	Measures Affecting Imports of Automobile Parts	3/30/06	Panel: July 18, 2008; Appellate: December 15, 2008	The Panel upheld U.S. claims. China repealed the challenged measures in September 2009
DS440	Anti-Dumping and Countervailing Duties on	7/5/12	Panel composed February 11, 2013; report pending	<i>NOTE: China allowed the duties to expire on December 15, 2013</i>
DS450	Certain Measures Affecting the Automobile and	9/17/12	In consultations; panel not yet formed	

Source: World Trade Organization.

In contrast to aerospace, however, China has by now successfully developed its own supply chains in the automotive sector. Years of government support have achieved their aim: foreign companies relocated parts production to China and upgraded China's supplier networks, a trend that is now difficult to reverse.^{***} Seventy percent of the world's top-100 auto suppliers were manufacturing in China by 2006, with over 1,200 foreign-invested

^{***} As the economists Loren Brandt and Eric Thun have noted, China feared that its firms would lose market share in key sectors to foreign-invested enterprises (FIEs) after WTO accession, when in reality, indigenous firms in many cases have slowly increased market share and deepened their technical capabilities. Brandt and Thun cite the auto sector as a key example of how the dynamics of competition between Chinese companies and FIEs in China's domestic market enhance upgrading prospects for Chinese firms. Loren Brandt and Eric Thun, "The Fight for the Middle: Upgrading, Competition, and Industrial Development in China," *World Development* 38:11 (November 2010):1555-1574.

enterprises in the segment.⁷⁷ By all indications, this pattern is continuing: in October 2013, for example, the Hubei-based SOE Dongfeng concluded a 50-50 JV with Germany's Getrag Group, one of the world's leading producers of advanced dual-clutch transmissions.⁷⁸

Alongside the gradual hollowing out of U.S. auto parts, a further concern is the lack of diversity in U.S. auto exports. The U.S. brands that rely most on exports are Chrysler and Cadillac, which do not have plants in China. Most of the models being shipped are larger vehicles, such as jeeps, SUVs, and luxury sedans. China thus inflicted major harm in December 2011 when it imposed anti-dumping and countervailing duties on American-produced automobiles with an engine capacity of 2.5 liters or larger. The duties affected some 80 percent of the U.S. auto exports to China at the time.^{§§§} To justify the duties, China's Ministry of Commerce alleged that these U.S. cars had been unfairly subsidized by the federal bailout and "dumped" into the China market.

The Obama administration filed a trade complaint in July 2012 to force China to rescind these duties, arguing that there was insufficient evidence of wrongdoing.⁷⁹ A panel was formed in February 2013. Before a formal decision was reached, however, it appears that China's Ministry of Commerce decided of its own accord not to renew the duties, which expired on December 15, 2013. The Ministry provided no clear explanation for why it did so.⁸⁰ Although U.S. auto exports to China in 2012 and 2013 rose in spite of these tariffs, they might have performed even better without them.

A risk is that U.S. automakers may in the future do more to boost China's than America's auto exports. For now, only some 4 percent of the cars produced in China are exported, mostly Chinese brands destined for such middle-income countries as Iran, Russia, and Brazil. But Bob Socia, head of GM China, stated in April last year that GM could triple its exports from Chinese plants by 2015, to 300,000 units. In other words, about one out of every four cars exported from China would be a GM brand.^{****} Contrary to many other industries, which now view China more as a consumer market than an export platform, the reverse appears to be occurring in the auto sector.⁸¹ If China becomes a formidable auto exporter – of U.S.-branded vehicles to boot – that could put more U.S. auto plants out of business.

The U.S.-China Economic and Security Review Commission was created by Congress to report on the national security implications of the bilateral trade and economic relationship between the United States and the People's Republic of China. For more information, visit www.uscc.gov or [join the Commission on Facebook!](#)

This report is the product of professional research performed by the staff of the U.S.-China Economic and Security Review Commission, and was prepared at the request of the Commission to support its deliberations. Posting of the report to the Commission's website is intended to promote greater public understanding of the issues addressed by the Commission in its ongoing assessment of U.S.-China economic relations and their implications for U.S. security, as mandated by Public Law 106-398 and Public Law 108-7. However, it does not necessarily imply an endorsement by the Commission, any individual Commissioner, or the Commission's other professional staff, of the views or conclusions expressed in this staff research report.

^{§§§} The duties covered more than 80 percent of U.S. auto exports to China, or about 92,000 vehicles. They added 15 percent to the price of an imported Jeep Wrangler or Detroit-made Jeep Grand Cherokee, 21.8 percent to a Buick Enclave and Cadillac CTS produced in Lansing, Mich., and 4.1 percent to an Acura TL sedan made by Honda of America Manufacturing Inc. in Marysville, Ohio. Tom Troy, "Obama to Fight China Tariffs on Cars: Dispute Is Centering on 2009 Bailout of Chrysler and GM," *Pittsburgh Post-Gazette*, July 5, 2012, via Factiva.

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