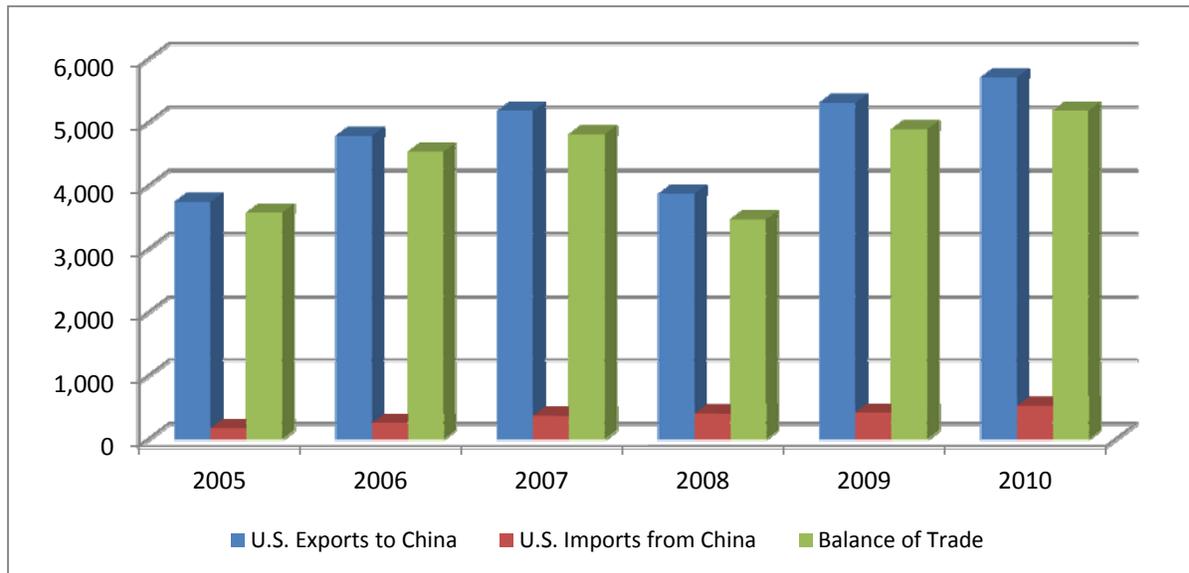


Country Studies: China



U.S. aerospace trade with China in millions of dollars

The People's Republic of China is investing significant resources to become a competitor in the civil aircraft industry. With its regional jet program in the flight testing phase, the Chinese are embarking on a new program to develop a 150-seat narrow-body aircraft that would compete with aircraft currently sold by Boeing and Airbus. The effort to create a competitive civil aircraft production program in China is in part motivated by growth in domestic demand for air transportation, which should lead to orders for over 4,330 new aircraft by 2029.¹ Attempts to capitalize on this demand have led established manufacturers to engage Chinese suppliers in various joint ventures while simultaneously eyeing the Chinese as future competitors.

In 2008, China undertook a major reorganization of its aerospace manufacturing enterprises. In May 2008, China established the Commercial Aircraft Corporation of China (COMAC) to oversee the development and production of a large civil aircraft now called the C919. COMAC was given responsibility for most of China's commercial aircraft programs, including the ARJ21 regional jet. In October 2008, the central government merged China's two large aerospace entities, Aviation Industry Corporations (AVIC) I and II, creating one business unit with ten aerospace subsidiary companies.² The new company, which took the name AVIC, was formed from various pieces of the former AVIC family. AVIC is a partial shareholder of COMAC. Since late 2008, enterprises dedicated to aircraft engines, helicopters, composites, and general aviation have been announced or rumored. A strategic agreement on specialized steel for large

¹ Boeing Current Market Outlook 2010. Viewed April 14, 2011. Available on the web at: <http://www.boeing.com/commercial/cmo/china.html>

² enAvBuyer.com. "China's new aviation giant targets 1 trln yuan revenues by 2017 – official." November 13, 2008. Available on the web at: <http://www.avbuyer.com.cn/e/2008/30511.html>.

civil aircraft was signed between Baosteel, China's largest steel producer and COMAC shareholder, and COMAC in January 2009. By early 2011, most of the major suppliers had been selected. As with the ARJ21 regional jet, most of the airframe will be produced by Chinese firms, while the subsystems will be made in conjunction with foreign suppliers. U.S. suppliers on the project include General Electric, Honeywell, Rockwell Collins, Eaton, Parker Aerospace, Crane, Kidde, DDC-I, Hamilton Sundstrand, and Nexcelle (GE nacelle joint venture with SAFRAN).³ Many of these companies are also suppliers to the ARJ21.

The C919 was first mentioned in China's 11th 5-Year plan, released in March 2006. Initially, the goal was to produce the plane for military and civil purposes by 2015, with entry into commercial service in 2020.⁴ China later moved up the date for commercial entry to 2016. The aircraft will be assembled in Shanghai and, as noted above, will have parts sourced globally. However, COMAC early on the selection process indicated that foreign suppliers would be required to participate in the project through joint ventures with Chinese manufacturers and to conduct a significant amount of the manufacturing in country. So far, that assertion has been reflected in most of the major systems procurements. One exception, at least for now, is the engine—the only C919 engine so far is the CFM LEAP-X1C engine, and it has not yet been determined if that engine will be assembled in China. COMAC has said that it intends to develop a domestic option.

While Chinese attention has turned to the C919, the ARJ21 regional jet has struggled. The original entry into service date for the ARJ21 was supposed to be 2007. Instead, the first ARJ21 rolled off of the assembly line in December 2007, and flight-testing was delayed until November 2008. The entry into service date has been pushed back several times, and the date currently stands at the end of 2011. Total orders for the ARJ21 stand at 240, mostly from Chinese airlines. No new orders were placed in 2010.⁵

Technological advancement of China's aviation industry has been directly related to cooperation and investment from international firms. On the one hand, western companies have sourced parts from China for several decades. Most major aerospace manufacturers outsource limited volumes of metalwork to Chinese machine tooling shops, due not only to lower labor rates but also to the wide availability of the latest tooling technology.

On the other hand, non-Chinese firms have played a significant historical role in the development of aircraft by Chinese firms, up to and including the C919. Many of China's early aircraft were based on Russian designs, though that cooperation stalled with the downturn of Russia's aviation industry. Later, U.S. and other western companies partnered with Chinese

³ COMAC C919. http://www.airframer.com/aircraft_detail.html?model=C919

⁴ Peder Andersen. U.S. International Trade Commission. "China's Growing Market for Large Civil Aircraft." p. 12. http://www.usitc.gov/ind_econ_ana/research_ana/research_work_papers/documents/ChinaLCA2-14-2008final.pdf.

⁵ Speednews Commercial Aircraft Program Status: December 31, 2010.

companies to incorporate western engines and components on Chinese aircraft. For example, starting in the late 1980s and into the early 1990s, Pratt & Whitney established joint ventures with Chinese firms to manufacture turboprop engines for several of China's Y-series transport aircraft. More recently, at least 19 U.S. and European aerospace companies have supplied major components on the ARJ21, including the engines (GE), avionics (Rockwell Collins), flight control systems (Honeywell, Parker Aerospace), and the landing gear (Lieberherr Aerospace).⁶ As noted above, a similar pattern is holding with the C919.

Western companies have also partnered with Chinese manufacturers to co-produce aircraft in China, though these programs have had mixed results. One of the most extensive U.S.–Chinese civil manufacturing partnerships was a program started in 1985 with McDonnell Douglas to assemble MD-82 aircraft in China. Thirty-five of these aircraft were produced, five of which were sold in the U.S. market.⁷ In 1994, McDonnell Douglas finalized an agreement to coproduce MD-90s in China, but only three of the planned 40 aircraft were assembled before the project was cancelled in 1998.⁸ Plans by Chinese and Airbus officials to jointly build a 100-seat “Asian Express” aircraft that would be added to the Airbus product line never came to fruition.⁹ Despite this history, in October 2006, Airbus signed a “Framework Agreement” with a Chinese consortium to assemble A320 aircraft in Tianjin, China, with production intended to serve the Chinese market. That facility delivered 11 aircraft in 2009, 26 in 2010¹⁰, and is expected to deliver 36 in 2011.

Finally, AVIC owns 49 percent of a joint venture with Embraer to manufacture, assemble, sell, and provide after-sales support for the ERJ 135/140/145 family of aircraft in Harbin, China. The enterprise delivered its first plane in 2004; slow orders, however, placed some doubt on the long-term viability of the project.¹¹ In February 2010, Embraer announced it would consider adding an ERJ-190 assembly line in the Harbin facility but by April 2011, this had changed to a Legacy assembly line.¹² The Legacy is based on the ERJ 135.

China's growing relationship with Canada's Bombardier deserves special mention. In 2006, Bombardier announced that it would start outsourcing significant airframe elements to AVIC subsidiary Shenyang Aircraft Corporation; today, it outsources fuselage sections and the empennage for the Q400 turboprop to SAC. In addition, Bombardier and China announced that

⁶ Andersen. p.11.

⁷ *The Changing Structure of the Global Large Civil Aircraft Industry and Market: Implications for the Competitiveness of the U.S. Industry*, ITC Publication 3143, Investigation No 332-384, November 1998.

⁸ Andersen. p. 8.

⁹ Diane Brady and Charles Goldsmith. “Airbus is Set to Help China Build Jetliner.” *The Wall Street Journal*. November 20, 1996.

¹⁰ Zhuan Ti. Airbus Maintaining an Active China Presence and Plans on Expanding. *China Daily*. January 27, 2011. http://www.chinadaily.com.cn/cndy/2011-01/27/content_11923806.htm

¹¹ Nicholas Ionides. “ERJ-145 deal earns reprieve for Chinese assembly line.” *Flight International*. Jan 24-30, 2006.

¹² Gregory Polek. More E190s destined for China; Embraer to build Legacies in Harbin. *AINOnline*. April 12, 2011. <http://www.ainonline.com/news/single-news-page/article/more-e190s-destined-for-china-embraer-to-build-legacies-in-harbin-29287/>

they would work together to develop aircraft in the 90 to 149-seat range. In practical terms, this meant that Bombardier would help the Chinese stretch the ARJ21 to 90+ seats and that Shenyang would invest in the development of the C-Series. The fuselage and doors for the C-Series will be made by SAC.

More recently, the collaboration was extended to also include the C919. In March 2011, a new agreement reached to explore ways of creating “commonality” between the C-Series and the C919. Commonality is attractive to airlines because it adds efficiency—commonality in the cockpit, for example, creates flexibility in pilot choice and commonality in components makes it cheaper to stock spare parts. Creating commonality would allow Bombardier and COMAC to market both aircraft as a family, which could presumably mean that they could help each other attract customers. The specific areas in which commonality will be sought have yet to be defined and may be limited by differences in partners. For example, while Goodrich and L-3 will provide the instruments and indicators for the C-Series, whereas GE and Honeywell are working on the comparable systems for COMAC.

China’s transition to a competitive producer of commercial jet aircraft and engines will be aided by its large and growing domestic aviation market, providing a ready market for new indigenous aircraft. China has the world’s fastest growing domestic aviation industry, with passenger traffic increasing at a rate of 7.6 percent per year.¹³ Given that there are only about 1,570¹⁴ commercial jets operating in China (compared to roughly 7,000 in the United States), industry analysts predict that Chinese airlines will need to add over 4,000¹⁵ large- and medium-sized aircraft to their fleets over the next two decades to meet this demand. Not surprisingly, Boeing and Airbus have identified China as the single most important market for sales over the next 20 years, and both companies are working hard to win orders from Chinese airlines.

Business opportunities in China are not limited to sales of large aircraft. Fleet expansion has been accompanied by infrastructure improvements, with 33 new airports added and 33 airports upgraded between 2005 and 2010, valued at 250 billion yuan.¹⁶ CAAC expects the number of airports serving scheduled flights to increase 230 by 2015 (this seems to surpass earlier estimates, which estimated that there would be 244 commercial airports 2020¹⁷). General aviation may eventually prove to be a significant market; for now, however, sales are limited by airspace, infrastructure, and tax restrictions. So far, rather than developing general aviation aircraft domestically, China has been acquiring general aviation capabilities through foreign direct investment. Over the past several years, Chinese companies have purchased several U.S. aerospace firms including Teledyne Continental, Epic Aircraft, and Cirrus (still pending) .

¹³ Boeing Current Market Outlook 2010.

¹⁴ Boeing Current Market Outlook 2010.

¹⁵ Consolidated estimate from Boeing, COMAC, and industry analysts.

¹⁶ “China to Build 56 New Airports in 5 Years.” April 7, 2011. http://www.chinadaily.com.cn/china/2011-04/07/content_12288202.htm

¹⁷ “97 Airports in 12 Years.” *The China Daily via People’s Daily Online*. March 25, 2008. On the web at: <http://english.peopledaily.com.cn/90001/6380001.html>.

In the end, future export prospects may be dampened if Chinese companies are able to satisfy some of China's growing demand with indigenously produced aircraft and other equipment. Western companies also may face new competition outside of China as Chinese manufacturers seek to expand their share of the global aircraft market. For now, aerospace companies are exercising cautious optimism while pursuing business opportunities in China.

Author: Alexis Haakensen
E-mail: alexis.haakensen@trade.gov
Phone: 202-482-6235