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The Effectiveness of China's Industrial Policies in Commercial Aviation Manufacturing

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RAND Office of External Affairs

CT-416

July 2014

Testimony presented before the Senate Commerce, Science, & Transportation Committee, Subcommittee on Aviation, Operations, Safety, and Security on July 31, 2014

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Published 2014 by the RAND Corporation
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The Effectiveness of China's Industrial Policies in Commercial Aviation Manufacturing²

**Before the Committee on Commerce, Science, & Transportation
Subcommittee on Aviation, Operations, Safety, and Security
United States Senate**

July 31, 2014

Thank you, Chairman Cantwell and Ranking Member Ayotte, for the opportunity to testify today on competition to U.S. aviation manufacturing from China.

Although China's government has had a long-standing interest in manufacturing commercial aircraft, to date it has not had much success.

Until recently, China's aircraft manufacturing industry produced aircraft almost exclusively for the Chinese military. Consequently, almost all of China's commercial aircraft have been imported from foreign manufacturers. In 2008, the Chinese government consolidated its efforts to develop a commercial aircraft manufacturing industry by setting up a new state-owned commercial aircraft manufacturing company, the Commercial Aircraft Company of China (COMAC), to build two domestic aircraft: a regional jet, the ARJ-21, already under development, and a narrow-bodied aircraft, the C919.

What does this mean for U.S. commercial aviation manufacturing? In this testimony I will briefly discuss:

- The effectiveness of the policies and mechanisms the Chinese government has used to create "national champions" in this industry;
- The effectiveness of steps taken by foreign manufacturers to increase sales in the Chinese market while seeking to prevent transfers of key technologies to potential future Chinese competitors;
- Policy options for the U.S. and the European Union to effectively respond to Chinese industrial policies; and
- The costs of China's current industrial policies.

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² This testimony is available for free download at <http://www.rand.org/pubs/testimonies/CT416.html>.

More details on all of these points are in the full RAND report, “The Effectiveness of China’s Industrial Policies in Commercial Aviation Manufacturing” available on the RAND website free of charge at http://www.rand.org/pubs/research_reports/RR245.html. My testimony this morning comes directly from that work.

China’s Commercial Aviation Manufacturing Industry

The Chinese government sees designing and manufacturing passenger jets as an important indicator of China’s technological prowess. Aviation manufacturing more broadly is seen as driving economic growth and innovation and as providing a key basis for national defense. To achieve the goal of creating a globally competitive commercial aviation manufacturing industry, the Chinese government has adopted a strategy of first engaging in domestic production and assembly using foreign designs, then developing its own designs with foreign assistance, culminating in the completely independent domestic development of commercial aircraft without foreign assistance.

To create an indigenous commercial aviation manufacturing industry, the Chinese government has employed the following policy instruments:

- (1) Setting up “national champions”;
- (2) Providing launch aid;
- (3) Compelling state-owned airlines to purchase Chinese aircraft;
- (4) Targeting orders to foreign manufacturers with assembly operations in China or who source from China;
- (5) Stipulating that foreign suppliers enter into joint ventures with Chinese partners; and
- (6) Encouraging foreign countries to purchase Chinese aircraft through diplomatic persuasion and the provision of loans.

China’s aviation manufacturing industry is large, although primarily focused on the production of military aircraft. The entire industry employs over 250,000 people. The smaller, commercial component of the industry has more than doubled output between 2005 and 2010. The entire industry has also become increasingly technologically sophisticated. However, in our view, Chinese government policies pursued to support the creation of “national champions” in commercial aviation manufacturing have not yet borne fruit. Although output of components for commercial aviation has grown rapidly over the last decade, the shares of China’s industry in world exports and in gross industrial output in China remain very small and have not markedly risen.

For example, the ARJ-21 is constructed largely if not entirely from components manufactured by foreign companies; the C919 will also depend on modules manufactured by foreign manufacturers, although these modules will be assembled in China. China's industry continues to struggle with systems integration: projected dates for the certification of the ARJ-21 have been postponed several times; the C919 is also delayed.

So what does the future hold for China's efforts?

The experts we interviewed believe that in the coming years Chinese manufacturers will continue to improve the quality and technological sophistication of their products. Almost all believe that COMAC will succeed in certifying the C919. Opinions differed concerning likely numbers of aircraft sold and delivered. One expert noted that current sales contracts are quite "soft" and that there are several ways by which buyers can avoid consummating the final sale, not least by cancelling orders due to delays in deliveries.

Moreover, by the time COMAC hits full production, the C919 will be technologically outdated compared to Airbus's and Boeing's new models, the A320neo and 737 Max, respectively. Most of those we interviewed felt that COMAC will not truly be able to break into the international commercial aircraft market until it manufactures its next aircraft, the C929, following the C919 and quite possibly, not even then. To develop the C929, COMAC will need another round of substantial financial support from the Chinese government over a relatively long period of time. Even then, many, if not most of the experts we interviewed were skeptical that COMAC could compete successfully with Airbus and Boeing.

In short, COMAC has yet to show that it will be able to produce commercially viable aircraft, much less show that it can become a commercially competitive aircraft manufacturer. Many of the experts we interviewed while conducting this research are skeptical that COMAC will be able to compete successfully with Airbus and Boeing.

However, one area where China is likely to be more successful than in commercial aviation is general aviation, smaller aircraft used for private, charter, or corporate use. China has been buying its way into the international market. CAIGA's, China's state-owned enterprise active in general aviation has acquired Cirrus, a U.S. manufacturer. It has also recently signed a joint venture agreement with Cessna to assemble Cessna's Citation model in China.

Foreign Investment in China

Despite the limitations of the Chinese commercial aviation industry noted above, why are foreign companies engaged in manufacturing commercial aviation products in China? There are several reasons:

- **Provide support to Chinese customers.** China's commercial aircraft fleet currently accounts for 9.6 percent of the global fleet. In light of the size of China's market, aircraft manufacturers and suppliers of major aviation components need to have operations in China to provide service to their customers.
- **Benefit from a competitive source of parts.** Foreign aircraft manufacturers and their suppliers have also turned to China for competitively priced parts. Chinese suppliers have provided intricately machined components and other technologically sophisticated components, such as parts manufactured from composite materials, at competitive prices.
- **Set up assembly operations to generate sales to Chinese airlines.** Manufacturers have found that assembly operations in China, such as Airbus's joint venture in Tianjin, facilitate sales of aircraft to Chinese airlines.
- **Purchase Chinese components as a marketing tool to encourage Chinese purchases of aircraft.**
- **Participate in the C919 program.** A slew of manufacturers have recently set up joint venture operations in China so as to be eligible to be a supplier for the C919 program.
- **Enhance the company's image in China.** Foreign companies have found that a manufacturing presence in China provides goodwill, increasing the likelihood that Chinese customers will purchase their products. Setting up manufacturing facilities for high priority projects for the Chinese government, such as commercial aviation manufacturing, is believed to generate goodwill for all of a company's activities in China.

Most major international commercial aviation manufacturers now have joint ventures in China. Foreign companies have set up these operations for a variety of reasons, but Chinese pressure for purchases of components manufactured in China and stipulations that suppliers for Chinese domestic aircraft set up joint ventures in China have definitely played a role. It would be surprising if these facilities are not eventually fully integrated into the global manufacturing base of these companies. Although some facilities, like Airbus's assembly operation in Tianjin, may remain dedicated to serving the Chinese market, over the course of the next decade we expect to see more supplier facilities in China specialize in specific products or modules and supply these to the foreign partner's global operations.

Many of the managers of foreign manufacturers with whom we held discussions argued strongly that sales of products manufactured by joint ventures in China do not compete with imports from the United States or Europe. They argued that the joint ventures serve to create, not destroy jobs

in their home countries. Sales made by the joint venture would not have been made if the joint venture had not existed; imports of parts and components for assembly by Chinese joint ventures generate employment in the United States or Europe. However, in the long-run, in our view more components are likely to be manufactured in China.

Those we interviewed on this topic stated that their Chinese partners were becoming more technologically sophisticated, but only a few voiced fears of losing their technological edge to Chinese companies, as long as their own (foreign) companies continue to innovate. Their companies' extensive marketing networks, incorporation of their products on aircraft manufactured by Airbus, and Boeing, and manufacturing know-how provide them with strong incumbent advantages.

Challenges for Foreign Companies

Foreign commercial aviation manufacturers, like many companies, find investing in China challenging. All of the companies with whom we spoke while conducting research for the report had been active in China for years and had developed strategies and programs to safeguard their intellectual property and technologies. The most common approach is to manufacture key components outside of China; the joint venture then imports the component for final assembly.

Another intellectual property safeguard is that materials and components used on aircraft must be certified by aviation regulatory agencies like the Federal Aviation Administration. This global regulatory system for the aviation manufacturing industry helps to lessen the theft of intellectual property in China. Because Chinese manufacturers must obtain international certification for their components even if components are to be used in Chinese aircraft, foreign companies that believe their intellectual property rights have been injured by Chinese companies are in a position to intervene to prevent the certification and hence sale of those products.

It is worth noting that foreign (non-Chinese) aviation product manufacturers underlined the importance of innovation in preventing the emergence of Chinese competitors. This is especially important in subcomponents where the barrier posed by certification is not as high. Many companies now design products specifically for China. A number of these companies noted that by focusing on quality, improving manufacturing efficiency, and distribution, they have been able to out-compete their Chinese competitors even at the lower end of the market.

Policy Options for the United States

Both the United States and the European Union face a conundrum. China's leadership appears convinced of the efficacy of industrial policies to foster new industries and expand exports. In contrast, the United States and the European Union have attempted to move away from industrial policies because of cost, lack of efficacy, and in the interests of creating a level playing field for international trade.

In both the United States and the European Union, the "squeaky wheel" rule reigns. Trade issues are placed on bilateral agendas or brought to the WTO only if a domestic company complains. Trade negotiators focus on other industries where competition from Chinese firms threatens to have immediate consequences rather than markets like commercial aviation manufacturing which U.S. and European firms still dominate. In a world in which immediate problems are given all the attention, what can and should the U.S. government and the EU do with regards to commercial aviation manufacturing? Several recommended options include:

- (1) Push for more transparent tenders for purchases of aircraft by Chinese state-owned airlines;
- (2) Ensure that Chinese aircraft components submitted for certification by the FAA or EASA do not incorporate intellectual property taken from other companies;
- (3) Work with domestic companies with operations in China to voluntarily report whether and how investment decisions in China have been influenced by Chinese industrial policies;
- (4) The U.S. government should engage in bilateral negotiations with the EU to discourage the use of purchases of components as a marketing tool by Airbus and Boeing;
- (5) Continue to press the Chinese government in bilateral forums and at the WTO to dispense with industry-specific industrial policies;
- (6) Monitor the development of the C919 and succeeding aircraft and intervene promptly through the WTO and bilateral forums in response to efforts to use subsidies or other supports to enter foreign markets.

Without a dramatic change in China's policy of "national champions" none of these measures are likely to create a level playing field in China for Western manufacturers. However, persistent efforts to reduce the trade distorting effects of China's industrial policies through countervailing duties or other measures may serve to mitigate some of the effects of China's policies.

Implications for the Government of China

In our view, the Chinese government would benefit from a careful assessment of its current policies of government support for commercial aviation manufacturing and whether this activity is a good use of China's resources. China is spending well over \$7 billion for the C919; the ARJ-21

has also been expensive. Yet many experts we interviewed were skeptical that either the C919 or the ARJ-21 will ever be commercial successes. In light of the many hurdles facing COMAC, in our view this is an opportune time for the Chinese government to rethink its investments and policies targeting specific industries. Focusing its energies on creating a business environment friendly to all firms, private, foreign, and state-owned alike, will be much more likely to result in a higher payoff.

One of the lessons of the post-World War II era has been the importance of the free flow of ideas and people for technological advances. The rise of the modern multinational corporation has played a key role in these advances. These companies are adept at creating multinational teams, drawing on talent from across the globe, to develop new products and processes. They have developed systems for developing and deploying new technologies and products.

One of the goals of China's leadership has been to put the country at the forefront of global advances in science and technology. China has talented engineers and scientists and has registered significant advances in a large number of industries, including space and telecommunications. It also has a number of successful multinational companies of its own. However, to the extent foreign companies are not given the same treatment as their Chinese counterparts, as has been the case in the wind turbine and high speed rail industries, or are afraid that their intellectual property rights will not be safe, they will remain cautious about what technologies they bring to China.

If China wishes to become fully integrated into the global commercial aviation manufacturing industry, China's government would be well advised to change its current policies so as to create a more equitable business environment for both foreign and Chinese commercial aviation manufacturers. The benefits of such a policy change for China would be considerable in terms of better allocation of investment, tighter integration into global technology supply chains, and the substantial savings of putting funds currently going to support "national champions" to better uses.

Thank you Chairman Cantwell, Ranking Member Ayotte, and members of this Subcommittee for the opportunity to testify before you this morning. I look forward to answering your questions.