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China's C919 Airliner: New Problems, More Delays

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When will the Chinese aircraft industry finally be able to take off internationally?
Photo by Clay Banks on Unsplash.

SYNOPSIS

The C919 passenger jet is a key component in China's efforts to break into the global commercial aerospace business. Nevertheless, it is facing continued technical

problems and delays. The plane is only the latest example of how the Chinese aircraft industry has long overpromised and underdelivered.

COMMENTARY

China is trying hard to enter the commercial airliner business, a lucrative sector dominated by the Boeing-Airbus duopoly. While it feels like the sector could do with more competition, it has been the hardest to break into. The global civilian aircraft sector is an elephant's graveyard of ambitious programmes — the Mitsubishi SpaceJet, Sukhoi's Superjet 100, Turkey's TRJet — that have failed miserably.

The C919 is China's current torchbearer to break into this "big boys club" of commercial aircraft production. It is a 160-seat narrow-body jet, roughly in the same category as the Boeing 737 and the Airbus A320, two workhorses of the skies. It is being developed and built by the Commercial Aircraft Corporation of China (COMAC); a state-owned company created in 2008 to take charge of national passenger jet development.

In 2012, COMAC predicted that it would conduct the first flight of the C919 in 2014 and begin deliveries by 2016. That didn't happen. In fact, the C919 did not fly until 2017, and it is yet to enter full-rate production.

Further delays are likely. In early December, COMAC admitted that the C919 will be unable to meet its goal of carrying out all its certification tests by the end of year. COMAC has so far only completed 34 of 276 planned tests. Much of this is due to stricter American export controls that were imposed on China in 2020, which in turn have restricted the supply of critical systems and spare parts to the C919 programme.

Overpromising and Underdelivering

China's commercial aerospace industry has historically overpromised and underdelivered. Back in the 1970s, for example, Mao Zedong backed a major effort to build the Y-10 airliner. The 178-seat Y-10 was basically a clone of the Boeing 707, one of the first large passenger jets. The Chinese acquired 10 of the Boeing 707s in the early 1970s, and even if they did not totally reverse engineer it, they used the 707 as their model. The Y-10 was initiated in 1970, and the first prototype flew a decade later. When it finally flew, at least one contemporary press account asserted that "one could no longer regard China as a backward country."

And yet, the project was quietly abandoned in the early 1980s. It was believed to be overweight and underpowered, and there were considerable safety concerns. There were even rumours that Y-10 was poorly balanced, and that, if improperly loaded, it would fall back on its tail.

Undaunted, in the mid-1980s the Chinese entered into a major partnership with McDonnell Douglas, then the world's second-largest commercial aircraft manufacturer. The Shanghai Aviation Industrial Corporation (SAIC) acquired a license to assemble the McDonnell Douglas MD-82 airliner, a 135-seat single-aisle airliner. Many MD-82 parts were manufactured in China, including the horizontal stabiliser, the nose landing and main landing gear doors, and other ancillary pieces. Other Chinese

aircraft companies participated as subcontractors to SAIC. The Chengdu Aircraft Industry Group, for instance, built the nose section for the MD-82.

The first SAIC-built MD-82 rolled out in 1986 and flew later that year. Nevertheless, only 35 Chinese MD-82s (and two MD-90s, a slightly improved version) were ever built before the programme was cancelled. McDonnell Douglas was later absorbed by Boeing and disappeared as an independent company.

China's Commercial Aircraft Endeavours in the 21st Century

China revived its efforts to build commercial airliners in the early 21st century, starting with the ARJ21, a 90-seat regional jet designed for short-haul flights. The ARJ21 was launched in 2002, and its maiden flight took place in late 2008. Like earlier programmes, the plane has faced numerous delays. It did not enter service until 2016; even then, only about 60 ARJ21s have been built. Noted aviation industry expert Richard Aboulafia has called the aircraft “stunningly obsolete”.

In fact, the ARJ21 is too small for most Chinese air routes, while the country's growing high-speed rail network bites into short-haul air traffic. Not surprisingly, therefore, the larger Chinese airlines, such as Air China and China Southern, have resisted buying the plane, and there are only firm orders for perhaps 225 ARJ21s.

The C919 isn't much of a step up. According to Aboulafia, it features no new technology, nor is it more fuel-efficient. There is, he says, “no technological selling point for this jet.”

The C919 is believed to have already cost China over US\$20 billion, and it has missed its milestones for first flight and first deliveries by at least three years. Additionally, neither the C919 nor the ARJ21 have yet been awarded airworthiness certification by the United States' Federal Aviation Administration (FAA), without which it is near impossible to sell the airliners outside of China.

So far, in fact, nearly all the orders for the C919 and ARJ21 have come from Chinese airlines, making it highly likely that Beijing strong-armed these companies into buying the planes. The first airline to receive the ARJ21, for example, was Chengdu Airlines, which is partly owned by COMAC.

Moreover, perhaps only a third of the orders for these aircraft are “firm”. The rest are either “options” — that is, non-binding purchase agreements — or else are unconfirmed orders.

All this may hardly matter to Beijing, however. Economic nationalism and pride are mainly driving the C919 and ARJ21. The decision to enter into the large commercial aircraft market was made at the very top, by the State Council of China and by the Central Committee of the Communist Party of China (CPC).

COMAC is the very embodiment of “aeronautical patriotism”, and it views the production of large commercial aircraft as its contribution to Xi Jinping's “China Dream”.

Additionally, COMAC and the C919 are part of China's gigantic and inefficient state-owned enterprise (SOE) system. This "Big SOE" approach is increasingly favoured by the CPC, and consequently billions are poured into an airliner programme with few prospects of global success.

Xi's Vanity Project

The C919 is basically a huge "vanity project" for Xi and the CPC. Great nations must have their own home-grown airliners. Furthermore, as Aboulafia has put it, "incompetent autocrats love" huge national passenger airliner projects, and "only autocratic regimes have the ability to allocate resources to national jetliners without anyone questioning why."

Some have even called the C919 a "practice plane", intended to build up China's skills in designing and manufacturing commercial aircraft. If so, then the C919, along with the ARJ21, are a rather expensive way to climb up the learning curve. When will China actually build something marketable?

In all likelihood, China will eventually sell a lot of C919s. Even if only Chinese airlines buy it, the domestic aviation market is huge (Boeing estimates that China could spend up to US\$3 trillion on nearly 8,100 new planes by 2038). And Beijing is prepared to throw a lot of money at commercial aircraft development, despite COMAC's inefficiencies and lack of experience in designing and engineering large passenger planes.

In fact, Beijing is putting a lot of emphasis on COMAC and the C919 *because* it lacks experience and expertise. Aboulafia has termed the C919 as China's "divorce jet". Currently, the C919 relies on Western companies to supply critical items such as flight controls, landing gear, thrust reversers and especially, jet engines. These systems, however, are increasingly subject to export restrictions, which has slowed the C919 programme.

Consequently, Beijing is using the C919 to promote home-grown solutions like the CJ1000 turbofan engine and nacelles. This strategy may eventually work — and money appears to be no object — but it will make the aircraft even harder to sell overseas.

If Beijing succeeds in forcing its domestic airlines to buy the C919 (and subsequent Chinese-made passenger jets), the Chinese passenger jet sector could ultimately be a success in terms of numbers, if not for commercial viability. For now, however, the industry is a no-show.

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