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COMAC: China's Looming Threat to the Global Aviation Industry

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Boeing and Airbus have long dominated the global commercial aircraft industry in production and innovation. But the rise of COMAC—China's government-created, mercantilist-fueled national champion—threatens the foundations of market-based commercial aviation.

KEY TAKEAWAYS

- The aerospace sector represents a critical dual-use industry providing needed capabilities to support national power, both in defense and commercial applications.
- The industry generates over $300 billion in impact, produces an over $80 billion trade surplus, and posts the strongest location quotient (1.52) of any U.S. advanced industry.
- The PRC's COMAC seeks to eliminate commercial aircraft imports and take large shares of the international market.
- COMAC is an illegitimate company that has risen on the back of a vast litany of mercantilist practices including aggressive subsidization, IP theft, forced tech transfer, below-market financing, and an increasingly closed national market.
- COMAC has received at least $72 billion in subsidies from Chinese federal and provincial governments, an amount that does not include a range of other supports such as tax benefits and free or low-cost land and utilities.
- America needs to develop a comprehensive strategy to support the competitiveness of the U.S. aerospace industry, including addressing technology/innovation, R&D investment, workforce shortages, and regulatory and trade policy considerations.
- The United States, the EU, and other allies should make a pact that their airlines will not purchase COMAC aircraft. Further, the United States and key allies, such as the UK, should reimpose export controls on jet engine sales to COMAC.

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INTRODUCTION

The United States—and later Europe—pioneered the commercial aviation age, with iconic companies such as Boeing, Douglas, and Lockheed and aircraft such as Boeing's 707, 737, 747, and 787; Douglas's DC-8; and Lockheed's L-1011. America's aerospace sector has been one of the country's most important advanced-technology industries, providing a critical source of innovation, exports, high-tech jobs, and defense industrial base spillovers.

Yet, America's leadership in this critical sector is no more assured than it is in any other high-tech sector, from biotechnology to semiconductors.[1] That's especially true when China—just as it has in virtually every other high-tech sector from artificial intelligence and biotechnology to electric vehicles (EVs) and semiconductors—has targeted commercial aircraft as a sector in which it wishes to rise to global dominance. And just as it has in those other sectors, China is deploying a vast panoply of "innovation mercantilist" policies—from massive industrial subsidization, intellectual property (IP) theft, forced tech transfer requirements, and preferences for domestic firms—to transform its national champion, the state-owned enterprise (SOE) Commercial Aircraft Corporation of China (COMAC), into a capable global competitor, especially initially in low- and middle-income countries. Moreover, China wishes to run the same playbook in commercial aircraft that it has deployed in countless other industries: develop a domestic competitor than can supplant international competitors in its domestic market and then have the national champion capture market share in third-party economies, depriving Western airplane makers of revenues in those critical markets, which in turn will reduce their ability to invest in research and development (R&D) and slow their innovation.[2]

From a market-based perspective, COMAC is an illegitimate company.

In short, COMAC represents a foundational threat to the global aviation industry, one that, frankly, policymakers in Europe and the United States barely see. Given the extensive barriers to entry in the commercial aircraft sector—including the tremendous expense of designing and developing not just an aircraft but also an entire aerospace ecosystem, the need to achieve significant economies of scale in the sector, and the presence of two already well-established and highly successful competitors in Airbus and Boeing—no private-sector company would dare enter the industry from the ground up. Indeed, just as was the case with Airbus in Europe (and also Embraer in Brazil and Bombardier in Canada/Quebec), only extensive and continuing subsidization by a government can foster the development of a globally competitive commercial aircraft company from scratch.[3] But at least Airbus and Embraer now compete (mostly) on market-based terms, whereas Chinese competitors in high-tech industries from semiconductors to solar panels to high-speed rail have used their massive government subsidization to compete on non-market-based terms, allowing them to underprice global competitors, subsist in markets with low operating margins, or both, whereas their competitors have to earn market-based rates of return to survive.[4] Thus, from a market-based perspective, COMAC is an illegitimate company.

And just as U.S. auto industry executives have framed the Chinese EV threat as an "existential" one to the U.S. auto sector, so the successful rise of COMAC would pose a fundamental threat to the U.S. commercial aviation industry.[5] It's therefore imperative that U.S. policymakers respond now, in two ways. First, the United States needs a comprehensive strategy to support the competitiveness of the U.S. aerospace industry, including investments in R&D and developing

new technologies through public-private partnerships. But the United States should go further to actively impede COMAC's development. Here, the United States should lead allied nations in a pact to refrain from purchasing Chinese commercial aircraft. The United States could go further by working with allies such as the United Kingdom to preclude COMAC from accessing the foreign engines indispensable to powering COMAC planes.

This report assesses the importance of the U.S. aerospace industry and analyzing the economics of the industry. It then proceeds to explore China's ambitions in the aviation industry, the rise of COMAC, and the role unfair "innovation mercantilist" practices have played in COMAC's rise. The report concludes with policy recommendations to sustain U.S. (and broader Western) commercial aviation leadership.

THE IMPORTANCE OF THE U.S. AEROSPACE INDUSTRY

The U.S. aerospace industry represents one of America's most-important high-tech industries. The Information Technology and Innovation Foundation (ITIF) has identified aircraft manufacturing as a key dual-use industry; that is, one that produces goods with civilian as well as defense applications.[6] In terms of output, in 2023, the industry produced $306.9 billion in economic output, which included $156 billion in aircraft manufacturing, $57 billion in aircraft engine and engine parts manufacturing, $49 billion in space vehicles and guided missiles, and $43 billion in other aircraft parts and components.[7] The industry supports 545,500 jobs directly and over 1.6 million U.S. jobs when direct and indirect employment effects are considered, and runs a global trade surplus virtually every year.. For instance, in 2024, the industry recorded just over $140 billion in exports against $60 billion of imports, producing a trade surplus of roughly $80 billion.[8] Location quotients (LQs) assess how much an industry contributes to a nation's economy compared with how much the industry contributes to the global economy. The United States posts an LQ of 1.52 for a category called "other transportation manufacturing" (which most prominently includes the aerospace sector), which represents the strongest LQ for any U.S. industry.[9]

If the United States were to lose the intangible knowledge of how to build an airplane, it could not reconstitute it without massive government subsidies and almost complete domestic purchase requirements.

Despite the success of the U.S. aerospace industry and its key players, such as Boeing, the future success of the industry is not guaranteed or assured, especially in the face of the relentless Chinese mercantilist practices this report discusses. If a company such as Boeing were to go bankrupt, the United States could not rely on market forces, including a steep drop in the value of the dollar, to later recreate a domestic civilian aviation industry. To do so would require creating not only a new aircraft firm from scratch but also the complex web of suppliers, professional associations, university programs in aviation engineering, and other knowledge-sharing organizations. With fewer aviation jobs, fewer students would become aeronautical engineers, making it difficult to rebuild capacity. If the United States were to lose the intangible knowledge of how to build an airplane, it could not reconstitute it without massive government subsidies and almost complete domestic purchase requirements.[10] In other words, taking the same steps Europe had to create Airbus, and China is now taking to create COMAC. The broader

point is that policymakers must be attuned to the health of the U.S. commercial aviation industry and not permit unfair foreign trade and economic practices to undermine the sector.

THE ECONOMICS OF AIRCRAFT MANUFACTURING—AND COMAC'S ILLEGITIMACY

Barriers to entry in the global commercial aircraft industry are extensive, and perhaps larger than those in any other industry besides semiconductors. Developing a commercial aircraft requires a deep base of skilled aerospace designers and technicians, a broad and deep network of specialized suppliers, and knowledgeable and technologically proficient aircraft regulators.

Moreover, it is enormously expensive to design and develop a modern commercial aircraft—and getting more expensive with each generation. For example, Boeing initially estimated the budget for the long-range, widebody Boeing 777 it began developing in the early 2010s at $5 billion, while it ultimately cost an estimated $12 billion–$14 billion to develop the aircraft.[11] It took Boeing almost eight years of development work and an expenditure of over $15 billion (three times the initial estimate) before a single 787 Dreamliner was sold.[12] Likewise, when Airbus launched the A380 program, it budgeted $10.7 billion—which represented half the value of the company at the time—while the total development cost reached $33.9 billion.[13] That's not infrequent in the history of jetliner development; when Boeing began developing the first commercial jetliner, the 707, in 1952, the $186 million it cost in development was $36 million more than the company was worth. In other words, aircraft manufacturers "are frequently betting the company when they decide to develop a new jet model."[14]

In short, commercial aerospace represents a classic innovation industry characterized by increasing returns to scale where average costs significantly exceed marginal costs, meaning that the first product manufactured and sold is more costly than the 1,000th—having to support the cost of upfront research, design, and development.[15] These economies of scale mean that the marginal cost of every additional unit is lower than the prior unit. In the 787 Dreamliner's case, not only would the $15 billion development cost be built into the overhead of every 787 sale, Boeing estimated that it would have to sell 1,900 of the jets just to break even on the program.[16] Nevertheless, unit costs for the 787 Dreamliner did drop quickly and steeply. A 2012 report noted that the cost to produce a 787-7 Dreamliner delivered to Japan's All Nippon Airways in July 2012 was already 50 percent less than the first aircraft delivered to that airline a year before.[17]

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For industries characterized by returns to scale, learning, or "experience," curves become crucial as companies learn how to manufacture more efficiently and produce the same product better as they produce more of them. The phenomenon, often referred to as "Wright's Law," derives from the 1936 insight by Curtiss-Wright aeronautical engineer Theodore Paul Wright that every time total aircraft production doubled, the required labor time for a new aircraft would fall by 20 percent.[18] Today, learning curves are generally understood as the phenomenon by which production costs tend to fall by a constant percentage for every cumulative doubling of production volume: going from 10 to 20 units produced yields the same percentage cost decrease as going from 10,000 to 20,000 does.[19]

To be sure, many advanced-technology industries—from semiconductors and software to automobiles and biopharmaceuticals—are similarly characterized by higher-than-average marginal costs and increasing returns to scale. However, the difference is that auto, semiconductor, and drug (excepting rare disease cases) manufacturers can spread their costs over tens or hundreds of thousands (if not millions) of annual product sales, whereas only about 1,500 large commercial jets (single aisle or widebody) are sold globally each year.[20] This means that aircraft manufacturers have to make back the billions they invest on product development, factories, tooling, training, etc. on just a few thousand aircraft sales.

Meanwhile, margins in the aircraft industry are already precariously low. For 2024, New York University professor Aswath Damodaran found that the profitability of the U.S. aerospace/defense industry (combined in his analysis) was just 4.37 percent, while it was 6.64 percent for European firms, and 5.15 percent globally.[21] In fact, from 1970 to 2010, Boeing—historically the world's most successful commercial aircraft manufacturer—averaged just over 5 percent annual profit.[22] In contrast, the average U.S. Fortune 500 company posted a profit margin of 8.6 percent.[23] Moreover, examining the history of jet aircraft manufacturing in 1982, John Newhouse estimated that, of the 22 commercial jet airliners that had by then been developed, only 2—Boeing's 707 and 727—were believed to have made any money.[24] Indeed, the few large aircraft programs that have been financial successes, such as the Boeing 737 and Airbus A320, have both spanned more than five decades and required high production volumes.[25]

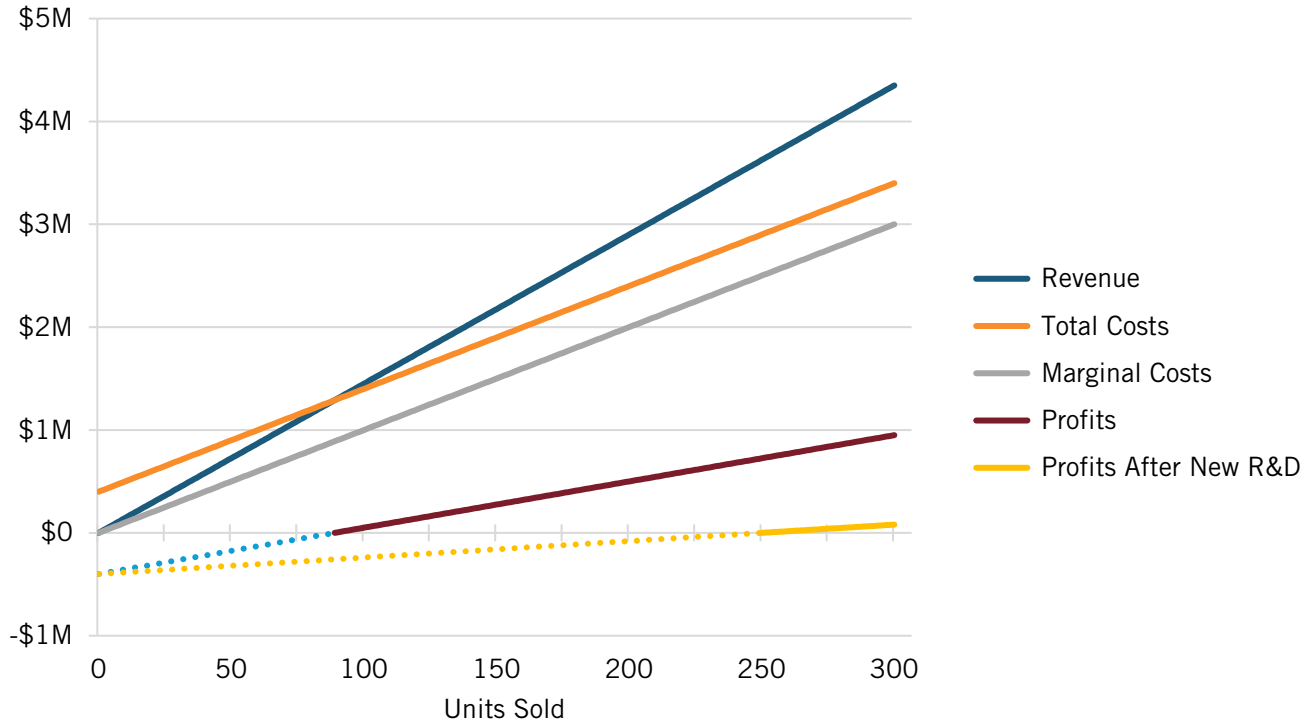
This is what makes the non-market-based nature of competition that COMAC brings to the table so insidious. It can compete without having to earn market-based rates of return—and so can underprice products to capture market share—while each aircraft it potentially takes from Boeing or Airbus disrupts the learning curves and economies of scale that the industry foundationally depends on. Indeed, one 2024 assessment (reviewing COMAC annual reports) finds that the company has reported at least $3 billion in losses since its incorporation.[26] This just reinforces the point that COMAC is a strategic industrial policy vehicle, not a commercial enterprise.

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To illustrate this dynamic, consider the cost structure of a hypothetical firm for which fixed costs are 40 times marginal costs—$400,000 and $10,000, respectively.[27] (See figure 1.) In other words, the company must spend $400,000 on R&D, design, machinery, and other fixed costs before it can produce its first unit. It then costs $10,000 to make each unit in terms of energy, materials, and labor, and the company can sell them for $14,450 per unit. Because of its high fixed costs, the company loses money until it sells at least 88 units. At that point, it makes an increasing profit on each additional unit sold. For these industries, scale is everything. Imagine if—because of tougher, subsidized competition from China—the sales of the U.S. firm drop to 75 units. In this case, the company would suffer a loss of $62,500. But if it faced less competition from China, then the company could earn a profit of $50,000 after selling 100 units. Meanwhile, whereas the total cost for producing the 75th unit would be $15,333, the total cost for producing the 100th unit would drop to $14,000. Now imagine the company needs

to invest 20 percent of its revenues in new R&D to remain competitive. That moves the goalpost; it would require selling more than 250 units to become profitable.

Figure 1: Hypothetical firm with fixed costs 40 times greater than marginal costs[28]



This is why scale is so critical for advanced industries, and why a threat from a robust competitor can be so devastating so fast. Profits fall fast so R&D and other core value creation capabilities are cut. As a result, the next generation of sales falls, and the downward cycle continues. America has seen this dynamic with a number of North American companies (e.g., Lucent and Nortel) facing the China challenge and industries (the U.S. solar panel industry), which fell from leadership astoundingly fast. The same is certainly conceivable in the commercial aircraft industry.

CHINA'S AEROSPACE AMBITIONS

As in virtually all other advanced-technology industries, China desires to achieve technological autonomy and self-sufficiency in the manufacture of jetliners for commercial aviation. As ever, China seeks commercial aircraft self-sufficiency for a host of interrelated reasons, including to reduce reliance on both foreign technologies and product imports, to ultimately create a competitive industry than can export products to international markets, and to foster development of an aircraft manufacturing "national champion" that can contribute to China's defense industrial base and help develop broader Chinese aerospace capabilities.

Indeed, fostering development of a national commercial aircraft champion has long been a key objective of the Chinese government, which "sees designing and manufacturing a passenger jet as an important indicator of a nation's technological progress."[29] Further, "China's government

sees a vibrant commercial aircraft manufacturing industry as a source of economic growth and technological spin-offs."[30]

China has sought to develop a domestic civil aviation industry since at least the 1970s; however, efforts throughout the 1980s and 1990s—including development of the Shanghai Y-10, a Boeing 707 knockoff—largely faltered.[31] China redoubled its efforts starting in the early 2000s. The Chinese government specifically identified commercial aircraft as a "priority" industry starting with the 10th Five-Year Plan (covering 2001–2005) and the industry was targeted in the subsequent 11th and 12th Five-Year plans. In the 2005 "National Medium and Long-Term Science and Technology Development Plan (2006–2020)," the Chinese government listed developing large aircraft as a major national science and technology project.[32] Later, in 2015, commercial aircraft were identified as 1 of 10 priority sectors in the "Made in China 2025" plan.[33]

In May 2008, the Chinese government created the Commercial Aircraft Corporation of China, or COMAC, as an SOE forged as a merger between the China Aviation Industry Corporation I (AVIC I) and China Aviation Industry Corporation II (AVIC II) and supported by five different state investors: China's State-owned Assets Supervision and Administration Commission (SASAC),Shanghai Guosheng Group, Chalco, China Boadu, and Sinochem.[34] SASAC owns about half of COMAC's shares, with the rest now held by eight other Chinese SOEs. However, COMAC is not just any regular Chinese SOE; it has been designated as one of China's "central enterprises"—a group of fewer than 100 state-owned conglomerates directly under the control of the Chinese Communist Party (CCP) and which,, as a central enterprise "shoulder(s) special responsibilities in the process of socioeconomic development of the nation."[35]

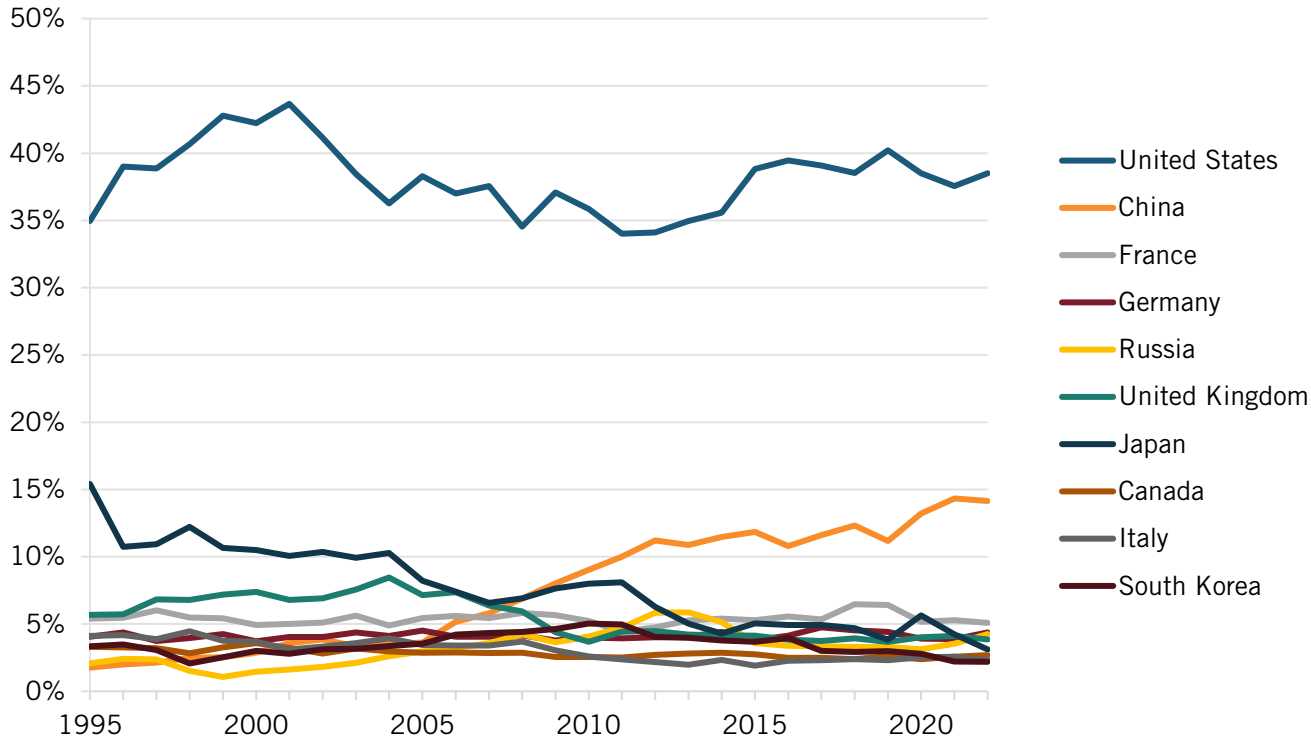
COMAC received an estimated $7 billion in seed capital from China's central and local governments, state-owned banks, and other SOEs to get off the ground.[36] COMAC's first commercially produced aircraft was the ARJ-21, a 78–90 seat regional jet that AVIC had begun developing in 2002 and made its initial flight in November 2008. (COMAC has delivered 124 ARJ-21 aircraft, rebranding it in 2024 as the COMAC 909.)[37] In 2009, COMAC petitioned and received approval from China's National Development and Reform Commission (NRDC) to develop a larger, single-aisle aircraft, the C919, whose provenance and development is further discussed in the following section of this report.

COMAC is not just any regular Chinese SOE; it has been designated as one of China's "central enterprises"—a group of fewer than 100 state-owned conglomerates directly under the control of the CCP.

The Organization for Economic Cooperation and Development's (OECD's) Trade in Value Added (TiVA) dataset provides data on value-added output by industry. China's output in the "other transportation industry," of which aerospace manufacturing is the most-significant component, has ballooned over the past several decades, in part due to its promotion of COMAC (although the category does also include high-speed rail and shipbuilding, which are certainly responsible for some part of that growth). From 1995 to 2022, China's global market share in this industry grew from just 1.8 percent to more than 14 percent, an over 700 percent increase. (See figure 2.) (Despite this explosive growth, China's LQ for other transportation remains at 0.78 percent.)

Thus, while America still leads in global market share in this critical sector, as in so many other high-tech industries, China's share is growing rapidly.

Figure 2: Global market shares in the other transportation industry[38]



THE COMAC C919 AND AECC CJ-1000 ENGINE

As noted, the Chinese government formed COMAC in May 2008. COMAC announced in January 2009 that it would develop the single-aisle C919, originally anticipating a maiden flight in 2014 and airline delivery in 2016.[39] In reality, it would be May 2017 before the C919 made its maiden flight, September 2022 before the C919 received its type certificate (an official document issued by a national aviation authority confirming that the design of a new aircraft, engine, and its components are safe, airworthy, and approved for production), and only in December 2022 did COMAC deliver its first C919 to China Eastern Airlines.[40]

First flight of the COMAC C919, May 5, 2017[41]



In general, analysts regard the C919 as a "me-too" aircraft, one that is in general imitative of the original-generation Boeing 737 MAX or Airbus A320.[42] Moreover, the core components of the COMAC C919—notably the engines, avionics, landing gear, etc.—are not Chinese produced but are in fact mostly foreign supplied. One assessment finds that 91 percent of the C919's critical systems, by value and complexity, come from foreign suppliers.[43] And only 14 of the 82 suppliers to the C919 are Chinese.[44]

That said, COMAC has brought some genuine innovations to the aircraft production process. One Western aviation analyst took note of COMAC's impressive use of digital tools in its production system to manage and integrate orders from suppliers and in the management of COMAC's quality and safety systems.[45] In a way, COMAC could come to the table with a "blank sheet of paper" in the early-2010s as it began to design and develop the C919 and began its production operations, and so the C919 was "born digital" in ways that aircraft such as the 737 (originally designed in the mid-1960s) weren't. That analyst was also struck by the extent to which XAC—a Chinese supplier that manufactures the wing for the Airbus A320 final assembly line in Tianjin, China, and which received the work package for wing production for the C919—uses robots to drill holes in the C919 wing in a much more efficient way than traditional (human) drilling practices do and which notably accelerates wing production time.[46]

Yet, despite some impressive process innovations, overall, China "has completely failed to bridge the technology gap [in commercial aircraft]," as one report observes.[47] As ITIF has noted, China has excelled in manufacturing sectors—such as EVs, solar panels, and telecommunications networking equipment—wherein Chinese manufacturers can benefit from subsidies and massive economies of scale to generate overcapacity and try to gain global market share by underpricing market-based competitors.[48] This approach seems to be less effective when production volumes are low and the technologies are exceedingly complex, requiring the integration of global best-of-breed suppliers, as is the case for semiconductor manufacturing equipment, jet engines, and jet aircraft themselves. Indeed, unlike EVs and solar panels, commercial aircraft do not benefit from rapid, iterative learning dynamics through mass production.[49]

China's efforts since 2011 to develop an indigenous jet engine for the C919—the CJ-1000A engine, being developed by Aero Engine Corporation of China (AECC)—has been even slower to take shape than the C919 itself has. Indeed, the CJ-1000 is unlikely to enter extensive service until at least the middle of the next decade, in part because the engine has yet to be tested on a C919 (as far as Western analysts are aware).[50] Domestic certification for the CJ-1000A isn't expected until 2027 or 2028, meaning the earliest the engine could enter mass production is 2030.[51] In the meantime, the C919 depends on the LEAP-1C engine, produced by CFM International, a joint venture between GE Aerospace and Safran.

INNOVATION MERCANTILISM IN CHINA'S AVIATION GAMBIT

The Chinese government continues to deploy a range of innovation mercantilist practices as it tries to help COMAC (and other Chinese aerospace players such as AVIC, which now focuses more on defense and aerospace systems) catch up to the global frontier in the aerospace industry, with aggressive industrial subsidization, below-market financing, IP theft, and forced technology transfer as the foremost among these practices.

Industrial Subsidization

COMAC represents a non-market competitor created and capitalized by the Chinese government as China's national aircraft champion. In 2020, Scott Kennedy of the Center for Strategic and International Studies (CSIS) calculated that subsidies COMAC had received from Chinese government entities over the preceding dozen years totaled $72.1 billion.[52] This included, by 2016, $38.2 billion from Chinese financial institutions; $7.5 billion from the China Export-Import Bank to support R&D, manufacturing, and sales; and $8.4 billion from 15 tranches of corporate bonds, mostly held by Chinese SOEs. However, while $72.1 billion represents a quite substantial figure, Kennedy noted that "this [amount] still does not include any unreported subsidies for R&D, free or low-cost land and utilities from the Shanghai government, tax benefits, and revenue from sales of the ARJ21 to state-owned airlines, who possibly would have bought regional jets from Embraer or Bombardier instead if given complete freedom."[53]

Compelled Joint Ventures

China has long adopted a strategy of "trading technology for market," and this strategy has been well in play with the country's efforts in the commercial aircraft industry. As one report explains, "Chinese government officials have clearly communicated to foreign firms in the commercial aviation industry that their business in China could be much more likely to enjoy success if they are seen as a 'friend of China.'"[54] Indeed, "COMAC has an explicit goal to leverage international partnerships and joint ventures to promote indigenization and overcome technological 'chokepoints.'"[55] Clearly, China has long sought to compel joint ventures as a way to bolster the country's capabilities in commercial aircraft manufacturing.

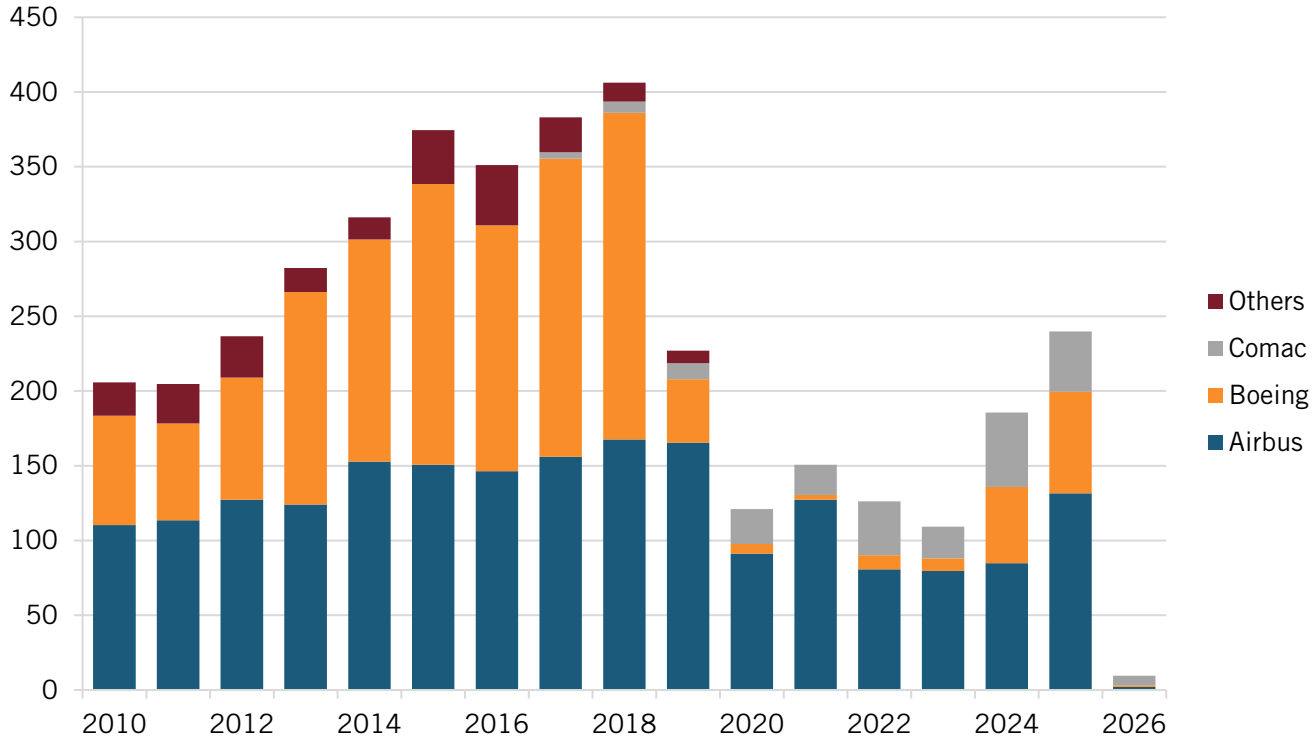
As early as 1983, McDonnell Douglas inked an agreement with Shanghai Automotive Group (SAIC) to assemble the MD-82/83 airliner in Shanghai. After assembling just 35 planes in eight years, McDonnell Douglas merged with Boeing and the program was discontinued.[56] In 2009, Brazilian aircraft maker Embraer entered into an agreement with AVIC to manufacture its E-145 regional jet as well as its Legacy 650 executive jet in Harbin, China; however, this effort was shuttered by 2016.[57]

COMAC is a non-market competitor created and capitalized by the Chinese government as China's national aircraft champion, and has received at least $72 billion in subsidies.

The most significant Western aircraft manufacturer presence in China has been by Airbus, which in 2005 established the aircraft manufacturer's first final assembly line outside Europe in Tianjin, China, also securing an order for 150 A320s at that time and a further 432 orders over the ensuing four years. In October 2025, Airbus launched its second final assembly line for the A320 aircraft in China (it has 10 in total, 4 others in Germany, 2 in France, and 2 in the United States). In December 2025, Airbus delivered its 800th China-assembled A320 family aircraft.[58]

As one analyst wrote (in 2014), "Prior to the opening of Airbus's joint venture in Tianjin, Boeing dominated the Chinese market. Since this assembly operation has been up and running, Airbus has more or less split the market with Boeing."[59] Indeed, that was mostly true at the time: from 2010 to 2018, Boeing sold an estimated 1,280 aircraft in China compared with Airbus's 1,250 aircraft.[60] However, from 2019 to the first few months of 2026, Airbus sold about four times as many aircraft in China as Boeing did, approximately 760 to 190 aircraft. (See figure 3.)

Figure 3: Deliveries to China by aircraft manufacturer, 2010–2026[61]



But Airbus's relationship with China has come at a cost. As one aviation industry analyst put it, "The fact that the C919 looks like an A320—as built by Airbus in Tianjin—is all the reason Western manufacturers need to maintain a cautious stance regarding technology transfer."[62]

Further, COMAC has attempted to get companies supplying components to the C919 to manufacture in China. As Crane et al. wrote, "COMAC has stipulated in its tender documents that modules and major components used in the aircraft be assembled in China by joint ventures, especially in high-technology areas such as advanced materials and flight control systems where Chinese technology is lagging."[63]

COMAC deputy general manager Wu Guanghui stated in 2010 that "local production is a requirement for foreign suppliers to the C919 program."[64] While this has been China's aspiration with the C919, and some suppliers have moved to produce locally, most of the major technologies and components—notably avionics, engines, and hydraulics—are still manufactured in Western nations and imported into China.

It should also be noted that, conversely, China has worked assiduously to get Western plane makers to incorporate Chinese-made parts into their aircraft. Indeed, more than half of all Airbus planes contain at least some components manufactured in China.

IP Theft

China subscribes to an "all-of-the above" technology-acquisition strategy, and Chinese theft of foreign IP and technology represents a vitally important component of this strategy, especially in the aerospace industry. In February 2020, William Evania, director of the National Counterintelligence and Security Center, singled out two fields in which China has placed a

priority on technology theft: EVs and aircraft.[65] Indeed, virtually every Western aerospace company—from Airbus, Boeing, and GE Aviation to Rockwell Collins and Safran—has been a target of Chinese cyberespionage.

As *Industry Week* wrote in an article entitled "How China Stole an Entire Airplane" (the C919), "China stands alone in the way it engages in broad-based, pervasive industrial espionage through the use of human resources, cyber-intrusion, and outright theft across a countless number of industries."[66] The article details how China's Jiangsu State Security Division (JSSD) led a "scheme to steal information from U.S. and international firms working with the Commercial Aircraft Corporation of China (COMAC)."[67] One recruited spy, a GE engineer named Zhang Zhang-Gui, disclosed confidential GE information for a payment of just $3,500. Recruited spies infiltrated French aerospace manufacturer Safran's facilities in Suzhou, China, inserting malware into the Safran computer network that downloaded confidential files.[68] In total, from 2010 to 2015, the cybersecurity firm CrowdStrike tracked a China-based group it dubbed "Turbine Panda" that launched multiple cyberespionage attacks against several of the companies that supply C919 components.[69] An indictment filed by the U.S. government on October 25, 2018, charged 10 individuals with conspiring to steal aerospace trade secrets from 13 Western companies, most of them based in the United States.[70] However, the damage done was considerable. CrowdStrike assessed that JSSD's hacking of Western aerospace companies allowed COMAC to trim "several years (and potentially billions of dollars) off of its development time."[71]

Acquiring Foreign Aerospace Companies

Another significant avenue of Chinese foreign technology acquisition is the outright purchasing (though often surreptitiously) of foreign companies in the aerospace industry.[72] A good example is the United States' Continental Aerospace Technologies (CAT), a subsidiary of parent company Continental Motors Company, whose constellation of companies had built engines for aircraft, tanks, and other combat vehicles during World War II.[73] In 1969, Teledyne Technologies acquired Continental Motors Company, including its subsidiaries, renaming the consolidated company Teledyne Continental Motors (TCM).[74] But in 2010, Teledyne sold TCM to Technify Motor (USA) for $186 million.[75] Despite the "USA" in its name, Technify Motor (USA) is a Chinese company, actually owned by AVIC.[76] Continental Aerospace Technologies' operational structure and deliberate branding obscure its Chinese ownership, granting AVIC—and by extension China's government—substantial strategic and competitive advantages in the aerospace sector.

CrowdStrike assessed that JSSD's hacking of Western aerospace companies allowed COMAC to trim "several years (and potentially billions of dollars) off of its development time."

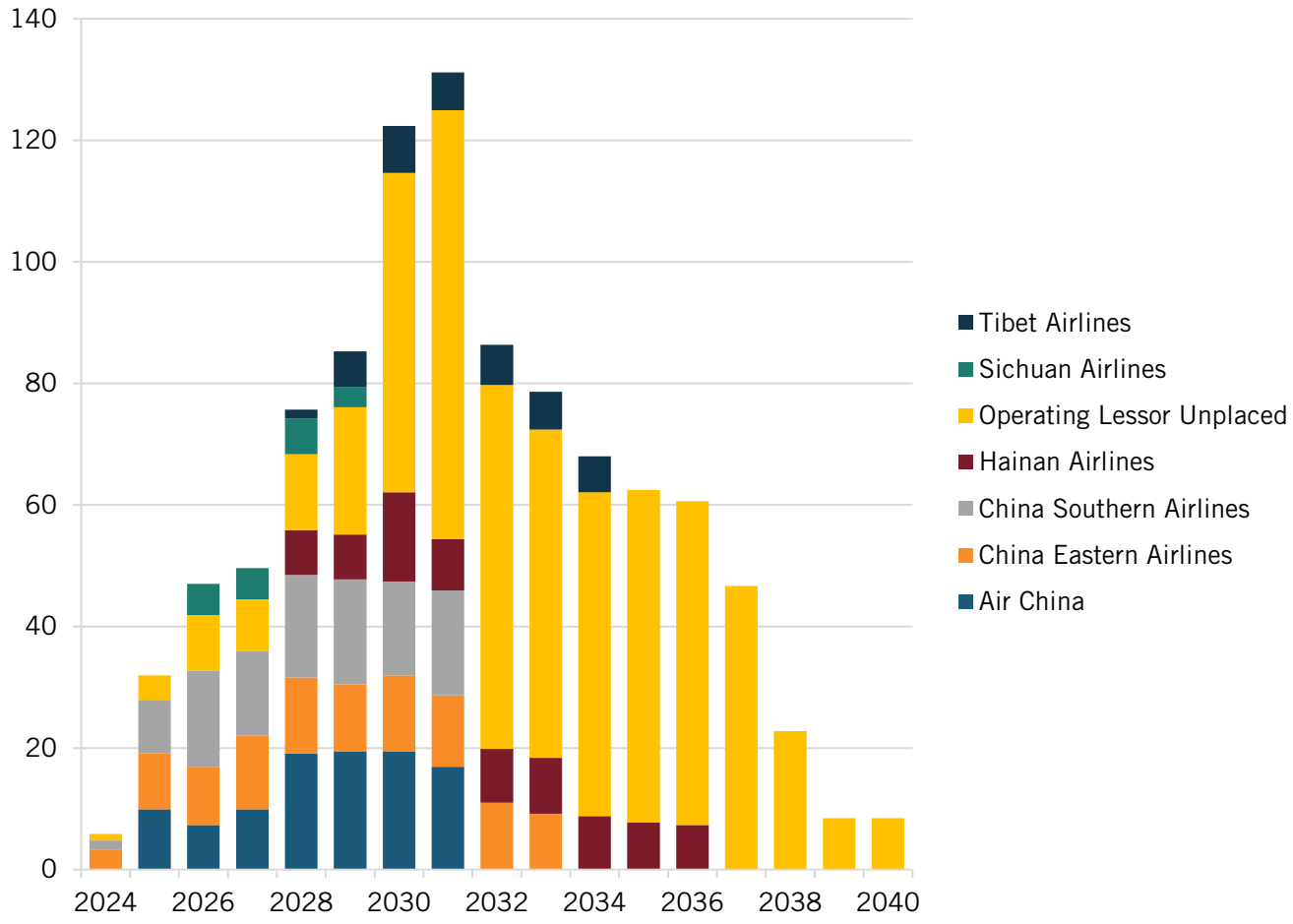
In fact, AVIC has even received U.S. government funding to sustain CAT's continued presence in the United States. The Alabama Department of Commerce assisted CAT in building a new $75 million facility to produce piston and turbine engines and parts for light aircraft in 2018, and selected CAT as a recipient for a Governor's Trade Excellence Award in 2022.[77] And, in 2020, the Small Business Administration awarded CAT with a $7.43 million Paycheck Protection Program loan, which was later fully forgiven.[78]

Other notable examples of China acquiring foreign aerospace companies include AVIC's 2016 acquisition of German firm Aerotec, in which China gained access to steel structures for aircraft and indirect access to the Airbus network.[79] Elsewhere, in 2021, AVIC Capital acquired a minority stake in Spanish aerostructures specialist Aernnova. And in the mid-2010s, China's Skyrizon attempted to buy Ukraine's Motor Sich for its innovative turbojet technology, but the deal was blocked due to Western pressure.[80]

Compelling State-Owned Airlines to Buy Domestic

It's little surprise that COMAC's first 300 orders for the C919 came from China's three-largest state-owned airlines: orders of 100 each from Air China, China Eastern, and China Southern. (Just as how, by April 2013, Chinese airlines accounted for 94 percent of orders of the ARJ21 regional jet.) That's because "the Chinese government is able to pressure China's airlines to order these aircraft through a variety of mechanisms."[81] As of 2024, according to aviation industry analysts at Cirium, COMAC had 1,003 C919 aircraft recorded as "on firm order" in the company's fleet database. Of those, 46 percent of the backlog was committed to six Chinese-domiciled airlines. The remaining 543 aircraft were on order with 12 operating lessors, all of which are Chinese owned and domiciled, aside from BOC Aviation.[82] (See figure 4.)

Figure 4: COMAC C919 scheduled deliveries[83]



Indeed, the Chinese government has a number of mechanisms through which it puts its "thumb on the scale" for Chinese airlines to purchase COMAC aircraft. First, the Civil Aviation Administration (CAA) of China is empowered to approve all purchases of aircraft by Chinese airlines, giving it the opportunity to "pressure airlines to purchase Chinese-designed and manufactured airplanes."[84] Second, China's three largest airlines—China Southern Airlines, China Eastern Airlines, and Air China—are all SOEs whose CEOs are appointed by SASAC and must be approved by the Central Organization Department of the Chinese Communist Party. As Crane et al. noted, "Job retention and career advancement depend upon how well these CEOs pursue the Chinese government's strategic goals" (i.e., helping support local Chinese aircraft manufacturers). Third, Crane et al. noted that these SOE airlines depend on financial support from the Chinese government, providing another pressure point to "buy local." Other analysts have pointed out other pressure levers, including even giving certain Chinese airlines preferential takeoff/landing time slots if the airlines' fleets have a sufficient number of Chinese-made aircraft.

Pressuring Foreign Countries to Purchase Chinese Aircraft

Promoting COMAC airplane sales represents a central goal of China's Belt and Road Initiative (BRI). In fact, China dubs its broader efforts to deepen aerospace relationships with developing country partners the "Air Silk Road."[85] In addition to attempting to promote Chinese aircraft sales, other elements of the Air Silk Road initiative include aligning civil aviation rules, standards, and certifications with partner countries, providing financing for those nations' transportation infrastructure, and exploring the potential for local suppliers to contribute to China's aerospace supply chain. For instance, in April 2026, China's national aviation regulator signed new partnership deals with its counterparts in Hong Kong and Macau to accelerate type certification for COMAC's widebody competitor, the C929.[86]

Another objective of the Air Silk Road initiative is to bolster passenger demand (ideally on Chinese jets) by "enhancing air route network connectivity with countries taking part in the Belt and Road initiative, supporting the launch of new international passenger and cargo routes as well as increasing flight frequencies."[87] In fact, of the 193 civil aviation construction projects planned in the year 2015, 51 strategic projects were supporting the BRI.[88]

One strategy China is using to bolster penetration of Chinese jets in emerging markets is for Chinese entities to take equity stakes in regional airlines. For instance, in November 2025, Chinese stakeholders took a 49 percent stake of Laotian Lao Airlines (not surprising, since China holds half of the Laotian government's $13 billion external debt).[89] In April 2026, Vietnamese budget carrier VietJet Air announced that it had agreed to lease as many as 10 Chinese-made C909 regional passenger jets.[90]

Essentially, China is pairing aircraft placements with financing, leasing, and even equity participation in national carriers, linking fleet decisions to long-term capital relationships. That matters, because as aviation industry analyst Aido Giovannitti has explained, "In aviation, a capital-intensive industry, competition is shaped by capital as much as technology itself."[91] As a subsequent section elaborates on, China's provision of export credit on generous terms is a key part of this strategy. Yet, China's export credit activity has raised serious concerns in particular due to size, scope, tactics, opacity, and operation outside OECD norms.[92]

Underpricing the Aircraft

Chinese enterprises have a long history of leveraging the massive industrial subsidization they receive to produce at tremendous economies of scale (often leading to overcapacity) as they seek to underprice their products in global markets in an effort to gain market share. For instance, imported Chinese EVs that have entered European markets sell for 32.5 percent less than comparable European models do.[93] In analog semiconductors, such as for microcontroller processors, Chinese manufacturers sell their products for 30 percent less than their international competitors do.[94] China's $42 billion in subsidies to its solar panel industry from 2010 to 2012 alone instigated a global glut that saw world prices for solar panels crash by 80 percent from 2008 to 2013, subsequently knocking out over 500 foreign competitors.[95]

The estimated unit cost for the C919 will be in the range of $90 million–$100 million, lower than the $111 million cost for a roughly comparable Airbus A320neo, and $121 million for a Boeing 737 MAX.

It appears COMAC will attempt to run the underpricing play in the single-aisle aircraft market as well. As one industry analyst explained, "China's state-owned aerospace firm COMAC is pitching its new C919 commercial airliners as a budget-friendly alternative to aircraft sold by the Airbus-Boeing duopoly."[96] To be sure, aircraft pricing can be difficult to pin down, given that so much is subject to negotiation, such as the size of the order, the variant of the aircraft, the financing arrangement, crew training, considerations for aftermarket servicing, etc. Nevertheless, one report estimates unit cost for the C919 to be in the range of $90 million–$100 million, lower than the $111 million cost for a roughly comparable Airbus A320neo, and $121 million for a Boeing 737 MAX.[97]

THE IMPORTANCE OF CHINA AND EMERGING MARKETS

The Global South lies increasingly at the front lines of the U.S./allied-China techno-industrial contest.[98] Indeed, whether American, Chinese, or European enterprises in advanced-technology industries such as automotives, telecommunications equipment, high-speed rail, or aircraft flourish globally will increasingly be determined by how they fare in third-party markets across the world. The Global South has a population of 5.2 billion individuals and accounts for 34 percent of the world's economy, with that share expected to grow to 45 percent by 2050.[99] Therefore, success in these markets is crucial to achieving the extensive sales needed to sustain production economies of scale and earn the revenues needed to reinvest in future generations of R&D and innovation.

And emerging markets are rapidly growing in importance in the global aviation industry, with markets in South Asia, China, and Southeast Asia (in that order) poised for the fastest growth over the next two decades. Passenger traffic within and between emerging markets has risen sixfold over the last two decades. And, already, the share of global traffic within and to/from emerging markets has risen to 60 percent.[100] Moreover, over the next two decades, the share of the global aircraft fleet deployed in emerging markets will grow by 10 percent, accounting for 50 percent of the global aircraft fleet by 2044.

China will be one of the fastest-growing commercial aviation markets going forward. Between 2024 and 2044, the size of China's aircraft fleet is expected to more than double, from 4,425 to 9,755 aircraft (with that growth including demand for 3,670 replacement aircraft and 5,330

new aircraft). Over that timeframe, analysts expect China's passenger traffic to grow 5.3 percent annually, outpacing projected economic growth of 3.7 percent. Analysts expect that growth to be driven by a growing Chinese middle class, as the share of Chinese middle-income households nearly doubles from 24 to 43 percent, making air travel attainable for more people.[101]

Thus, China will represent a vital growth market. Unfortunately, as noted previously, in recent years, Airbus has taken a lead over Boeing in China aircraft sales. As of March 2026, Airbus fielded 2,389 aircraft in China's airline fleet, compared with 1,919 for Boeing and 219 for COMAC.[102] And, as noted, from 2019 to 2026, Airbus sold four times as many aircraft in China as did Boeing. COVID-19 wasn't the cause of this discrepancy (Airbus sales in China were down compared with pre-COVID years but were still significant over this period). Certainly, Boeing's travails with the 737 Max were a significant contributing factor to the widening sales discrepancy.[103] But that's not the only dynamic: Airbus having established an A320 manufacturing facility in Tianjin has curried significant favor with the Chinese government—a government that places its significant finger on the scale when Chinese airlines decide which new airplanes they're going to purchase.

Leaving that point aside, the real threat is COMAC. Rob Morris of the aviation industry consultancy Cirium contends that, over the next 20 years, COMAC could capture 20 to 30 percent of a Chinese market for 6,000 short-haul planes.[104] Such an eventuality would inflict significant damage to the economics of the market-based global aviation industry.

POLICY RECOMMENDATIONS

While the primary remit of this report is to examine how COMAC's innovation mercantilist-driven rise threatens the Western commercial aircraft industry, ITIF offers several policy recommendations grouped around technology/innovation, workforce/skills, and, most importantly, trade policy.

The most important message is that **the United States and the West should simply say no.** While perhaps policymakers could be forgiven for letting certain Chinese industries, such as solar panels, telecom equipment, wind turbines, steel, bulk chemicals, and others decimate Western industries—thinking that those industries were competing fairly or that they didn't fundamentally matter—this time around, there is no excuse for inaction. We know the CCP's intent. We know its playbook. And we know what the results will be without action. Western nations, including Asian and European allies, need to say that under no circumstances will they allow their domestic carriers to buy COMAC planes, as much as their airlines may want to do so to save money.

Technology and Innovation

The United States needs to develop a comprehensive strategy to support the competitiveness of the U.S. aerospace industry. (ITIF has laid out a similar strategy for how to do so in a recent series of three reports examining the competitiveness of the U.S. auto sector over the past 60 years.)[105] The United States should be supporting research into new high-risk/high-reward civil aviation technologies, especially new airframe concepts and propulsion architectures. This could be achieved through a combination of National Aeronautical and Space Association (NASA) and other agency technology development contracts and Department of Defense (DOD) military crossover programs.[106] NASA's Aeronautics division has already undergone substantial cuts over the past two decades, with the budget for the Aeronautical Research Mission Directorate

declining by 37 percent when adjusting for inflation.[107] Unfortunately, the Trump administration has called for further cuts to this division, with the FY 2026 budget proposal calling to cut the department's budget from $955 million in FY 2025 to $588.7 million (a cut of over 40 percent), including the most significant funding cut for the Advanced Air Vehicles Program (AAVP) to $133.4 million from $259.6 million in FY 2025.[108] Yet, the AAVP program "develops the tools, technologies, and concepts to enable safe new aircraft that are faster, quieter, and more fuel efficient" and plays an important role in helping develop new aeronautical technologies that have both commercial and defense spillovers.[109]

Several federal institutions have historically collaborated with industry to advance aerospace innovation, with the DOD, NASA, and the Department of Energy (DOE) all top contributors to aerospace-related research. For instance, the Aerospace Corporation, a major Federally Funded Research and Development Center (FFRDC) sponsored by the Air Force, is a significant contributor to aviation innovation, investing over $1 billion in R&D in FY 2025.[110] The Aerospace Corporation works with domestic commercial industry partners and international organizations to enable cross-border information sharing with U.S. allies.[111] This program and others have supported billions of dollars in private-sector R&D, with over $19 billion invested by the federal government in private businesses in 2023 alone.[112]

Federal investment has also supported aerospace research in higher education. For example, Wichita State University invested $350 million in aerospace research in 2025, more than any other university in the country. Wichita State benefits from industry support and several federally funded programs to support its research, including the U.S. Air Force's Survivable Airborne Operations Center. **Congress should ensure that federal programs supporting R&D in aerospace in the public and private sectors are protected and not subject to budgetary cuts.**

Lastly, a number of the Manufacturing USA institutes—such as America Makes (additive manufacturing), ARM (Advanced Robotics for Manufacturing), IACMI (The Institute for Advanced Composites Manufacturing Innovation), LIFT (advanced lightweight materials), and MxD (digital manufacturing)—are developing advanced manufacturing process technologies of import to the U.S. aerospace industry. **The Department of Commerce's National Institute of Standards and Technology (NIST) should develop a strategy to flow relevant innovations emerging from these Manufacturing USA institutes into the U.S. aviation sector.**[113]

Workforce/Skills

Ensuring an adequate base of workforce skills remains a challenge for the U.S. aerospace industry. For instance, Boeing is currently onboarding more than 100 factory workers each week to address the growing global demand for commercial aircraft.[114] Thus, in the aerospace industry as in others such as automotive and semiconductors, America needs more skilled technicians. One program that should be considered for scaling is the Massachusetts Institute of Technology's (MIT's) "Technologist" project, which trains talented incumbent manufacturing workers picked by their companies on a new career path between engineer and technician, enabling them to undertake the systems approach to the factory floor required to implement advanced manufacturing technologies and processes.[115]

Further, America needs more universities focused on particular industries.[116] Some already exist, such as the SUNY Maritime College, which trains merchant marine officers, naval architects, and marine engineers. Kettering University (formerly the General Motors Institute) in Flint, Michigan,

is built around co-op education wherein students alternate between classroom study and paid work at automotive and manufacturing companies.[117] **Congress should appropriate funds to DOE to create a competition to establish up to 10 industry- or technology-focused universities, at least 1 of which should be focused on the aerospace industry** and modeled after Kettering University, ideally located near another hub for aerospace manufacturing and assembly.

Regulation

The pace of aerospace innovation is accelerating rapidly, which means that, for airplane manufacturers, the quality of the national regulatory environment in which their aircraft are certified exerts a considerable impact on their competitiveness. As such, it's important that countries' aircraft regulators, such as the Federal Aviation Administration (FAA) in the United States, are equipped with adequate resources, skilled personnel, and processes to ensure that they can evaluate and approve new aircraft technologies and systems while maintaining passenger safety. As such, **the FAA should explore how it can modernize its aircraft certification processes to keep up with the rapid pace of technological innovation in the aerospace industry.**

Trade Policy

There are several facets of trade policy that will be crucial in ensuring the continued competitiveness of the U.S. commercial aircraft industry.

Commercial Diplomacy

The United States needs to continue to make prioritizing aircraft sales a key component of U.S. commercial diplomacy. This will be especially important in the context of increasing Boeing aircraft sales to China in the face of intense competition with Airbus. To that end, President Trump announced a deal from a May 2026 meeting with President Xi that called for China purchasing at least 200 Boeing aircraft.[118] More broadly, the International Trade Administration (ITA) fosters American prosperity by enhancing the international competitiveness of U.S. industry, promoting trade and investment and helping ensure foreign compliance with U.S. trade agreements.[119] Unfortunately, the Trump administration's FY 2026 budget calls for a decrease in ITA funding of $191 million from the 2024-enacted level of $611 million down to $420 million.[120] As ITA plays a critical role in U.S. trade promotion, **instead of decreasing ITA appropriations, Congress should increase them to at least $450 million in FY 2026.**

Export Credit Financing

The Ex-Im (Export–Import) Bank of the United States plays a key role in helping U.S. exporters gain sales.[121] The bank not only provides financing for export transactions that might not otherwise occur when private commercial lenders are unable or unwilling to provide financing to foreign purchasers of U.S. exports, but also plays a key role in leveling the playing field for America's exporters by matching the credit support that other nations provide, ensuring that U.S. exporters are able to compete based on the price and performance features of their products.[122] America's Ex-Im Bank is especially critical in supporting U.S. commercial aircraft sales, as reflected by the fact that, of the Bank's FY 2024 exposure level of $34 billion, commercial aircraft accounted for the greatest share of any sector, at 29 percent.[123]

Unfortunately, Ex-Im Bank funding has declined dramatically in recent years. For instance, while, in FY 2011, the Ex-Im Bank authorized $32 billion in transactions and authorized $35.8 billion in FY 2012, Ex-Im Bank authorizations haven't eclipsed $10 billion since FY 2015 and

were just $8.4 billion in FY 2024.[124] Meanwhile, global export credit expenditures grew from $71 billion in 2015 to $115 billion in 2024. From 2015 to 2019, China's export credit volume reached roughly 90 percent of the volume of the G7 countries combined.[125] China—the leading provisioner of export credit—extended $23.5 billion in export credit in 2024, about four times the U.S. amount.[126]

Congress will need to reauthorize the Ex-Im Bank by December 31, 2026 (on February 6, 2026, Senators Kevin Cramer (R-ND) and Mark Warner (D-VA) introduced reauthorizing legislation), and this should be supported fully by the Trump administration.[127] **In the reauthorization, Congress should significantly increase Ex-Im lending levels.**[128] The Ex-Im Bank has achieved very low default rates for many years—just 0.91 percent in FY 2024. While that's laudable, it can prevent the Bank from taking on somewhat riskier, yet worthy, investments. **As such, in reauthorizing legislation, Congress should increase the permissible Ex-Im Bank default rate from 2 percent to at least 4 percent.**[129]

The OECD's Aircraft Sector Understanding (ASU) represents a "Gentlemen's Agreement" that sets out the terms and conditions that apply to officially supported export credit relating to civil aircraft, seeking to minimize subsidies in government-provided financing for civil aircraft export transactions.[130] Adherents to the ASU include Australia, Brazil, Canada, the European Union, Japan, South Korea, New Zealand, Norway, Switzerland, the United Kingdom, and the United States—but not China. As such, China is able to offer more attractive export credit terms to foreign aircraft buyers (as it does in other sectors). Indeed, China regularly undercuts OECD financier competitors. For example, a recent ODI Global research report explains how the Chinese export credit agency (ECA), Sinosure, provides guarantees at highly favorable rates—up to a maximum of 7 percent of the project value—for its medium- and long-term coverage for overseas projects up to 15 years. In contrast, OECD ECA competitors were subject to a minimum floor in their pricing and could only offer a maximum tenure of 8–10 years.[131] China is not playing by the rules of global export credit finance, particularly in the commercial aviation sector. **The United States should insist that China join the OECD's Aircraft Sector Understanding.**

Strategic Trade Partnerships

China has a long history of playing the United States and Europe against one another.[132] For instance, during the first Trump administration, officials from the EU and its member nations were happy to see the United States impose tariffs and other restrictions on China, knowing it would both slow China's mercantilist growth and bring retaliation against U.S. firms. But rather than stepping up to support America in this task with measures of its own, the EU took advantage to further its own sales and investment in China. Yet, in the long run, if the United States and Europe do not stand together to contest China's rapid innovation mercantilism, both parties will end up weaker.

For this reason, ITIF has argued that **the United States should move beyond simply seeking free trade agreements (FTAs) and forge the development of Strategic Techno-Economic Agreements (STEAs):** binding trade and technology agreements among America and its close trade partners designed to strengthen allied national power industries while constraining China's ability to dominate them. Unlike traditional free trade agreements, STEAs would not treat all sectors as equally important. This type of agreement would go beyond tariff reduction to include national

power industry collaboration, defense production, export-control alignment, investment screening, digital integration, and commercial counterintelligence.

One element of such an STEA could be **Europe, the United States, and leading Asian nations such as Japan and South Korea standing together to make a pact that their airlines will not purchase Chinese commercial aircraft.** Unfortunately, some European airline CEOs have already signaled their openness to doing so. Michael O'Leary, Ryanair Group CEO, stated last year, "The Chinese are basically building a f*****g A320. So if it was cheap enough – 10 or 20% cheaper than an Airbus aircraft – then we'd order it."[133] But that's the path toward decimation of the Western commercial aviation industry. As this report explains, if China is able to sell such aircraft at prices 10 to 20 percent cheaper, it would be primarily because of the unfair support the company has received in developing its aircraft—not just from the massive government subsidization the firm has received, but also thanks to the foreign IP it has pilfered. It's for this reason that ITIF has argued clearly that Chinese EV manufacturers not be permitted to manufacture their vehicles in or export them to the United States without facing extensive (100 percent) tariffs (and why Europe itself has imposed tariffs of 39 percent on Chinese EV imports).[134] The United States and Europe should not reward Chinese innovation mercantilism by welcoming their products into our markets, and that's especially true in a vital high-tech industry such as commercial aircraft.

As pertains to the aerospace sector, **such an STEA could also include a dedicated commercial counterintelligence framework for aerospace.** This would constitute a "Five Eyes-like" economic intelligence mechanism focused on state-sponsored industrial espionage in national power industries, including commercial aviation. This would include real-time information sharing on cyber intrusions, suspicious investments, and export-control evasion, among others.[135] Governments could establish secure channels for aerospace firms to share threat indicators without exposing proprietary information or facing antitrust concerns.

Export Controls

The United States has explored the option of imposing export controls on jet engine sales to China. In May 2025, the Trump administration suspended U.S. engine sales to COMAC.[136] However, just a couple months later, in July 2025, the Trump administration reversed the suspension and again permitted U.S. (GE Aerospace) jet engine shipments to China's COMAC.[137]

It is likely that export controls on jet engine sales to COMAC would be highly effective. Aerospace industry analysts believe it's unlikely that AECC's CJ-1000 will enter extensive service until the mid-2030s at the earliest, meaning that COMAC is going to be fully dependent on Western engines to power COMAC aircraft for the foreseeable future. This provides the United States an even stronger point of leverage over China than it has in other chokepoint technologies such as semiconductor manufacturing equipment. And if this lever is used, it could substantially impede the development of China's commercial aviation industry for some years—years which could be crucial as Boeing traverses its recent travails and gears up for its next generation of commercial aircraft, including the 777-9 widebody and a next-generation single-aisle aircraft that could succeed the 737 MAX that is reportedly on the drawing board.[138]

Some might be concerned about the potential loss of U.S. jet engine sales if the United States were to impose export controls on the item to China, but the reality is that there's no reason for this to be the case. If anything, the global industry faces a shortage of aircraft—and engines. For

instance, only about 7,000 aircraft were delivered in the six-year period from 2019 through 2024—far below the pre-pandemic trajectory, which, had it been continued, would have resulted in the delivery of about 12,000 aircraft over that same timeframe, suggesting a shortage of 5,000 aircraft produced over that period.[139] Moreover, Boeing estimates that from 2024 to 2044, the industry will need to deliver 43,600 jets to meet rising global passenger demand for air travel, 76 percent of which will be single-aisle jets and 18 percent widebodies.[140] In other words, there will be plenty of demand for Western jet engines in the years ahead, even without having to supply Chinese aircraft manufacturers.

Indeed, if anything, the industry is already grappling with jet engine shortages, such as of the fuel-efficient geared turbo-fan models manufactured by Pratt & Whitney.[141] Also, notably, since late 2022, COMAC has delivered just 35 C919s. It only delivered 15 C919s in 2025 (far short of its goal of 75) and is on pace for (at best) just 28 deliveries in 2026 (as COMAC delivered just three C919s in the first quarter of the year).[142] As the *South China Morning Post* reported on April 24, 2026, this is in part due to a "bottleneck [that] appears to emerge after [C919 aircraft] completion, when finished aircraft wait for engines and key components that arrive more slowly than expected."[143] Through their control of jet engine technology, Western countries hold the power to set Chinese commercial aircraft development plans back by a decade. **The United States should work with key allies such as the United Kingdom (where Rolls Royce—a leading jet-engine manufacturer—is headquartered) to reimpose export controls on jet engine sales to COMAC.**

CONCLUSION

China's effort to build a globally competitive commercial aviation sector through COMAC represents a fundamental challenge to the largely market-based structure that has long defined the industry. While Airbus and especially Boeing have succeeded and grown through decades of innovation, scale, and commercial discipline, COMAC's rise has been propelled by extensive state support, non-market practices, and rampant innovation mercantilism.

Although COMAC is far from achieving parity with industry leaders—with large technological gaps in engines and advanced systems and just a small number of models—the combination of sustained subsidization, protected domestic demand, and expanded influence in emerging markets positions the firm as a foundational and emerging threat. In an industry such as aerospace, where scale and profit depend heavily on a small number of sales, even incremental market-share losses can have outsized impacts on incumbent firms and their ability to compete. To be sure, the West probably would not feel real pain for perhaps another decade. But like stage 4 lung cancer, by the time pain arrives, the condition may be terminal. In this case, we know enough to detect the aerospace cancer in stage 1, with plenty of time for treatment and cure, but only if we jointly act now.

In order to counter COMAC and its substantial state support, the United States and the EU (and other key allies such as Japan and South Korea) must implement a coordinated policy response as outlined in this report—one that combines increasing competitiveness with impeding COMAC's development. Absent this, the United States and the EU risk ceding leadership in one of the world's most strategically important advanced industries, and with it becoming dependent on the CCP.

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The Information Technology and Innovation Foundation (ITIF) is an independent 501(c)(3) nonprofit, nonpartisan research and educational institute that has been recognized repeatedly as the world's leading think tank for science and technology policy. Its mission is to formulate, evaluate, and promote policy solutions that accelerate innovation and boost productivity to spur growth, opportunity, and progress. For more information, visit itif.org/about.

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