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THE SINO AVIATION DIPLOMACY ACROSS ASIA

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Abstract

The Commercial Aircraft Corp of China (COMAC), a state-owned enterprise, has strategically positioned itself within the global aviation sector through the introduction of the ARJ21 regional jet and the C919 narrow-body aircraft. The inaugural commercial flight of the C919 in May 2023 positioned it in direct competition with the Boeing 737 Max and the Airbus A320. The utilization of aviation diplomacy by China, exemplified through COMAC's promotional activities in Asia, seeks to enhance its economic and diplomatic influence via collaboration in civil aviation. The qualitative study, employing a single case and documentary evidence, suggests that COMAC's initiatives extend beyond mere marketing efforts. The participation in the 2024 Singapore Air Show, along with subsequent demonstration visits to Laos and Malaysia, has resulted in significant international attention for its advertising campaign, leading to initial orders. The sales encompass the inaugural foreign delivery of the ARJ21 to TransNusa Airlines in Indonesia, as well as a significant agreement with GallopAir, based in Brunei, for the acquisition of 30 aircraft, which includes the first overseas purchase of the C919. The study indicates that the Civil Aviation Administration of China is actively participating in aviation diplomacy. This involves bilateral aviation safety arrangements, such as the Working Arrangement with Indonesia, as well as regulatory modifications in Brunei and Vietnam aimed at recognizing and adopting airworthiness standards. The diplomatic and regulatory initiatives are essential to address structural challenges, such as the market dominance of the Boeing-Airbus duopoly, the reliance of the C919's supply chain on Western suppliers for critical components, and the certification obstacles posed by the FAA and EASA. China is utilizing the aircraft produced by COMAC as instruments of diplomacy and commerce, thereby demonstrating its technological aspirations and reinforcing connections within Asia.

Keywords

Aviation Diplomacy, Sino Aviation, Diplomacy, COMAC.

Resumo

A Commercial Aircraft Corp of China (COMAC), uma empresa estatal, posicionou-se estrategicamente no setor da aviação global através do lançamento do jato regional ARJ21 e do avião de fuselagem estreita C919. O voo comercial inaugural do C919, em maio de 2023, colocou-o em concorrência direta com o Boeing 737 Max e o Airbus A320. A utilização da diplomacia aeronáutica pela China, exemplificada pelas atividades promocionais da COMAC na Ásia, visa reforçar a sua influência económica e diplomática através da colaboração na aviação civil. O estudo qualitativo, recorrendo a um caso único e a provas documentais, sugere que as iniciativas da COMAC vão além de meros esforços de marketing. A participação no Singapore Air Show de 2024, juntamente com visitas de demonstração subsequentes ao Laos

e à Malásia, resultou numa atenção internacional significativa para a sua campanha publicitária, conduzindo a encomendas iniciais. As vendas abrangem a entrega internacional inaugural do ARJ21 à TransNusa Airlines na Indonésia, bem como um acordo significativo com a GallopAir, sediada no Brunei, para a aquisição de 30 aeronaves, o que inclui a primeira compra no estrangeiro do C919. O estudo indica que a Administração da Aviação Civil da China está a participar ativamente na diplomacia aeronáutica. Isto envolve acordos bilaterais de segurança da aviação, tais como o Acordo de Trabalho com a Indonésia, bem como alterações regulamentares no Brunei e no Vietname destinadas a reconhecer e adotar normas de aeronavegabilidade. As iniciativas diplomáticas e regulamentares são essenciais para enfrentar desafios estruturais, tais como o domínio de mercado do duopólio Boeing-Airbus, a dependência da cadeia de abastecimento do C919 em fornecedores ocidentais para componentes críticos e os obstáculos de certificação impostos pela FAA e pela EASA. A China está a utilizar as aeronaves produzidas pela COMAC como instrumentos de diplomacia e comércio, demonstrando assim as suas aspirações tecnológicas e reforçando as ligações dentro da Ásia.

Palavras-chave

Diplomacia da Aviação, Aviação Chinesa, Diplomacia, COMAC.

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Introduction

Aviation and diplomacy have had a certain degree of linked relationship. Aviation allows people to travel long distances swiftly, drastically altering the nature of diplomacy in the 20th century (Kobierecki, 2020). The aviation domain encompasses all elements related to flight and the aircraft industry. It has revolutionized global travel and transportation by making long-distance journeys that were once deemed impossible now achievable. Continuous advancements in aircraft technology are consistently pushing the limits of air travel and impacting a variety of industries around the globe.

The advancement of the aviation industry is not exclusively propelled by private businesses but also encompasses state-owned enterprises. Numerous states have founded national airlines and provided funding to local aircraft manufacturers to stimulate their economies and showcase their technological capabilities. The aviation sector experiences more government intervention than any other industry, which creates a significant burden despite the competitive nature of the global market. The combination of competition and government interference leads to a fragmented aviation industry (Chattopadhyay, 2015).

China serves as a prime illustration of state intervention within the aviation sector. Among emerging and newly industrialized nations, China boasts the largest aircraft industry in employment, heavily focused on military aircraft production. The majority of these aircraft are intended for domestic use. However, in the early 21st century, the Chinese government made a significant commitment to invest in the advancement of commercial jet aircraft (Eriksson, 2017).

Despite the dominance of foreign aviation manufacturers in the market, China aims to make a mark in the industry by pursuing the goal of producing its own aircraft. Since 2008, the state-owned Commercial Aircraft Corp of China (COMAC) has been working on developing the C919 jetliner, which is designed to compete with popular models like Boeing's 737 and the Airbus A320 (Bowerman, 2014). China is determined to retain its profitable large commercial airplane market and not allow foreign companies like Boeing and Airbus to dominate it, especially considering that China's own demand accounts for a significant portion of the global market. Similar to Airbus, China's entry into the industry will be facilitated by government support, and this development is anticipated to have significant consequences for both the United States and Europe (Levine, 2015).

Other than the C919 narrow-body jet, COMAC is also developing the ARJ21 regional jet.[1] The ARJ21 is China's first turbofan aircraft with fully autonomous intellectual property, accommodating 70-110 seats. It aims to connect central cities with neighboring mid-sized and small-sized cities through air routes (Xu, 2015). Since June 2016, COMAC has delivered a total of 117 ARJ21 aircraft to different airlines. A significant achievement was reached on 24 November 2023, as the regional jet ARJ21 exceeded 10 million passenger trips (Luo et al., 2024).

COMAC continues to face ongoing challenges with its ARJ21 and C919 aircraft. Chinese aircraft manufacturers have encountered significant challenges in obtaining certification for their commercial planes from both the Federal Aviation Administration (FAA) of the United States and the European Aviation Safety Agency (EASA). The absence of certification from these esteemed regulatory bodies poses a formidable obstacle for COMAC in its endeavor to market its aircraft internationally (Francis, 2016). Despite facing challenges, COMAC continues to promote the C919 and ARJ21 aircraft. The ARJ21 has attracted attention from countries outside of China, making it the first Chinese-made airliner to be used in international commercial flights (Bitzinger, 2010).

This paper focuses on China's aviation diplomacy through COMAC across Asia. China has been utilizing its state-owned aircraft manufacturer, COMAC, to strengthen ties with other Asian countries through partnerships and sales of civilian aircraft and regulatory framework. The aviation diplomacy demonstrated by COMAC also demonstrated how China is breaking through the challenges faced by its homegrown aircraft manufacturers.

Literature Review

Previous research on how aviation diplomacy is used in terms of international relations and trade policy illustrates a multifaceted approach where air transport agreements serve as instruments for fostering bilateral and multilateral ties. Kobierecki (2020) provides a comprehensive article that offers a conceptual framework for analyzing the relationship between aviation and international relations. The importance of aviation in diplomacy is underscored by the substantial increase in air travel popularity over the past decades. Additionally, it is argued that aviation diplomacy warrants further exploration by scholars in the fields of diplomacy, international relations, and political science (Kobierecki, 2020). In terms of aviation diplomacy in Asia, Indriani (2021) posits that aviation diplomacy is instrumental in promoting ASEAN identity through the strategic use of air assets and infrastructure as mechanisms of soft power, manifesting in three distinct approaches. Initially, airlines acted as emblems of both national and regional identities. Secondly, air operations are employed to forge political connections, particularly in scenarios involving humanitarian efforts. Lastly, the establishment of air transportation networks and airports is crucial for facilitating cross-border mobility and enhancing regional connectivity.

Yang (2024) examines the significance of aviation diplomacy in the relationship between Belarus and China, highlighting its role in key agreements such as the Joint Statement on enhancing the comprehensive strategic partnership in the new era. Additionally, the

[1]In 2024, COMAC announced that the ARJ21 was renamed to C909 as the commercial name of the aircraft. In this paper, the aircraft will be referred to as the ARJ21.

creation of air routes connecting Belarus, China, and Russia is seen as a pivotal development. This interconnectivity not only represents active governmental collaboration within multilateral and bilateral contexts but also facilitates economic growth, tourism, and humanitarian efforts across these nations. Listianto (2024) explores the interconnection between aviation and tourism diplomacy, exemplified by AirAsia Indonesia's approach to what is termed "beyond state interactions." This strategy involves the use of special liveries on aircraft to advertise different tourist destinations within Indonesia. These liveries facilitate interactions that occur directly between AirAsia Indonesia and its customers, thereby promoting tourism through an innovative form of diplomatic engagement.

There is a lack of literature addressing aviation diplomacy concerning state-owned firms like COMAC, which promotes Chinese-manufactured aircraft. This gap underscores a substantial avenue for research on how state-sponsored enterprises such as COMAC utilize their products as instruments of diplomatic involvement via aviation.

Aviation Diplomacy

Aviation diplomacy is used to bridge international relations and aviation. More accurately, it emerged as a field of study when scholars began observing the political aspects of the aviation industry. International aviation is more than just a mere challenge within a dynamic global economic framework; it represents a significant concern in the realm of international diplomacy. It influences governments' perceptions towards each other, shapes the perspectives of individuals regarding their own and foreign nations, and has far-reaching implications on the security measures that govern our lives (Lowenfeld, 1975). Aviation serves as a significant tool for nations to exert soft power. One illustration of this is how efficiently managed national airlines can enhance the international image of their respective countries. Moreover, aviation plays a pivotal role in enhancing soft power by bridging geographical gaps and fostering connections among individuals, societies, businesses, concepts, advancements, and prospects (McClory, 2014).

The concept of aviation diplomacy entails using commercial and general aviation activities to foster global collaboration and enhance relationships between nations. Aviation diplomacy plays a vital role in breaking down barriers and fostering greater unity among diverse populations and communities by facilitating air travel and cargo transportation along established flight routes. Aviation diplomacy is also known by various terms like "air diplomacy" or "aero diplomacy."

Aviation diplomacy represents the outcome and illustration of the diversification and democratization of diplomatic practices. It symbolizes a specific domain of diplomatic interaction – the sphere of global aviation, whose importance has been on the rise in recent years due to the expanding population of travelers. Additionally, it involves the participation of new diplomatic entities, specifically international aviation organizations or airlines (Kobierecki, 2020). Another term for aviation diplomacy, "air diplomacy," refers to the strategic utilization of airpower in nonviolent operations to prevent conflicts and bolster a nation's influence (Lowther, 2010). Another explanation about air diplomacy involves using elements of air power to strengthen foreign policy goals (Wijetunge & Wanasinghe, 2021). Countries utilize aviation diplomacy to establish a positive image globally through different diplomatic strategies. This can be accomplished

by leveraging national airlines, airports, and air shows. In essence, aviation diplomacy is intertwined with public diplomacy, utilizing soft power mechanisms to wield influence internationally (Kobierecki, 2020).

According to Kobierecki (2020), key indicators of aviation diplomacy include several strategic elements. Firstly, aviation serves as a foreign policy tool where governments leverage aviation agreements and logistical arrangements to influence diplomatic strategies. This includes negotiating bilateral air service agreements and manipulating flight routes to foster or strain international relationships. Secondly, aviation acts as a means of promoting national image. Airlines and airports are utilized to symbolize national identity and prestige, showcasing a nation's technological progress and cultural appeal. Lastly, aviation subjects such as the International Civil Aviation Organization (ICAO), the International Air Transport Association (IATA), and individual airlines engage as diplomatic actors. They participate in negotiations, set international standards, and embody quasi-diplomatic agents, thus extending their influence beyond commercial interests to broader political and diplomatic realms.

Methods

This study utilized a qualitative methodology, employing a single case study approach to specifically examine China's aviation diplomacy through COMAC, the Commercial Aircraft Corporation of China. Qualitative research design, as outlined by Creswell and Creswell (2018), is used to deliver a thorough and in-depth analysis of social phenomena through meticulously examined qualitative data. The findings are presented as thorough and reliable narrative accounts (Creswell & Creswell, 2018). This study examines documentary evidence, aligning with the assertion by Creswell and Creswell that qualitative inquiry requires the collection of various data types, including documents, to develop a thorough understanding of the subject.

A single case study approach was selected, as it allows an in-depth examination of a single instance to test theoretical explanations or identify causal factors within a specific real-world context. A single case could provide highly valid conceptual insights by accounting for the nuanced intricacies of various situational elements. Though only analyzing one case, meaningful conclusions may still be drawn about wider phenomena by retaining a comprehensive understanding of the intricate dynamics involved through an immersive investigation of that single instance. This approach holds the potential to offer rich conceptual backing alongside broader implications through a focused evaluation of one case's unique context (Curini & Franzese, 2020).

The case study focuses on COMAC's C919 narrow-body airliner and ARJ-21 program, examining how these initiatives may be leveraged to enhance China's diplomatic engagements and promote its aviation industry on the global stage. Data is gathered through a comprehensive documentary analysis of industry reports, news articles, and documents related to COMAC's efforts in international cooperation and the overseas marketing of the C919 and ARJ21. This approach aims to provide a thorough understanding of the strategic use of these aircraft programs in furthering China's diplomacy, highlighting its potential impact on international relations.

Results and Discussions

Commercial Aircraft Corporation of China (COMAC)

Around 2000, China began developing its commercial aircraft industry, driven by the rapidly growing civil aviation sector. Projections showed Chinese airlines would need about 8,700 aircraft between 2020 and 2040, making China the largest aircraft market globally. This led to a focus on domestic aircraft projects, financed and managed by Chinese entities. However, the lack of technological expertise and experience posed significant challenges, requiring substantial investment in knowledge and resources. Consequently, private enterprises were deterred, leaving State-Owned Enterprises (SOEs) as the primary means to build an indigenous commercial aircraft industry (Chen et al., 2024). In 2008, the Chinese government initiated the establishment of COMAC as an autonomous entity by segregating the China subsidiaries from the Aviation Industry Corporation of China (AVIC) and transferring the intellectual property related to China's regional jet, the ARJ-21. AVIC continues to hold a significant role in China's aerospace industry, serving as the country's primary military aircraft producer and a key supplier to COMAC (Zenglein & Sebastian, 2023).

ARJ21 and C919

Initially revealed in 2002, the Advanced Regional Jet for the 21st Century (ARJ-21) represents a significant milestone in the State Council’s grander plan. This aircraft marks the first instance of China producing a passenger plane entirely of its own design, development, and manufacture (Stokes, 2009). As of November 24, 2023, the regional jet ARJ21 has surpassed 10 million passenger trips since June 2016, marking a significant milestone. COMAC has delivered 117 ARJ21 aircraft to various airlines, allowing them to operate on over 400 domestic and international routes spanning more than 140 cities. With nearly 1800 flights per week, the ARJ21 has become a prominent player in the aviation sector (Luo et al., 2024).

The ARJ21, a 90-seat regional jet, is a collaborative effort between COMAC and Bombardier, with its design based on the McDonnell-Douglas MD-90. The major subsystems of the ARJ21 were procured from suppliers in North America and Europe. Despite facing several delays, the delivery schedule was pushed from 2010 to 2011. Originally initiated by AVIC, the project was later handed over to COMAC when the latter took charge of commercial aircraft development. The future focus of COMAC on regional jets remains uncertain, as projections indicate limited growth in the Chinese regional jet market (Harrison, 2011). The ARJ21 has proven to be a successful aircraft, achieving several noteworthy milestones from 2022 to 2024. On December 18, 2022, the ARJ21-700 aircraft was delivered to TransNusa Airlines, an Indonesian carrier, as reported by China Daily. This delivery marked the inaugural entry of China's jet airliner into the international market (Wenqian, 2022). On April 18, 2023, as announced in a press release by China Aircraft Leasing Group Holdings Limited (CALC), TransNusa Airlines successfully commenced commercial operations with its first ARJ21 aircraft after meeting rigorous air operator certification requirements from the Directorate General of Civil Aviation of Indonesia (DGCA), and the inaugural flight from Jakarta to Bali has been

successfully completed (CALC, 2023). TransNusa Airlines received its second ARJ21 aircraft on June 10, 2023, per the COMAC agreement (Wu, 2023).

On September 22, 2023, Reuters reported that GallopAir, a newly established Brunei-based airline, plans to purchase 30 aircraft from COMAC. This deal includes the first overseas acquisitions of the C919 jet. The agreement comprises 15 orders for ARJ21 aircraft, including its freighter and business jet variants, as well as 15 orders for the C919 (Reuters, 2023). GallopAir is aiming to commence operations by the end of 2024, pending approval from Brunei's aviation regulator for the regional jet manufactured by COMAC, as per a separate report (Barrington et al., 2024).

The C919, a passenger aircraft developed by China as part of a national project, was created and manufactured by COMAC. Originally planned for completion in 2012, its inaugural flight was set for 2016. Despite these setbacks, COMAC is poised to become a formidable contender in the civil aviation market, challenging the dominance of Boeing and Airbus in the future. The C919, designed to accommodate between 150 and 170 passengers, is set to compete with the Boeing 737 and Airbus A320 in the aviation industry (Victoria & Petrescu, 2019). The C919 aircraft project is closely linked to the establishment of COMAC on May 11, 2008. The corporation was created with the primary objective of overseeing and managing the development of the C919. This initiative aimed to meet the anticipated demand for large passenger aircraft in China over the next twenty years (Levine, 2015).

These aircraft projects highlight China's progress in aerospace technology and its aspirations to compete globally. The ARJ21's success in domestic and limited international operations and the C919's potential to challenge established aircraft underscore China's strategic intent.

COMAC's Into Global Competitive Landscape and Structural Challenges

The landscape of the global aviation market is promptly dominated by the duopoly of Boeing and Airbus. According to BOCO et al. (2025), Airbus and Boeing have maintained a lucrative duopoly in the commercial aircraft manufacturing industry for decades, together possessing around 99% of the global market share, as reported by the International Air Transport Association. The current stance is supported by significant fixed costs, rigorous regulatory barriers, and substantial market power, which together hinder new entrants such as COMAC, whose ability to compete internationally is limited by certification constraints (BOCO et al., 2025). Scholars have argued that the duopoly of these companies is reinforced by governmental assistance/subsidies, which Chasmar (2020) describes as aid. The substantial assistance provided to both Airbus and Boeing exemplifies the approaches employed by the United States and Europe in formulating industrial policy. In contrast to the direct and overt aid offered to Airbus by participating European governments, the aid provided to Boeing is marked by a multifaceted array of tax incentives, export assistance, procurement strategies, and various other forms of encouragement from different levels of government. Moreover, Truxal (2024) argued that state subsidies in the aircraft manufacturing sector have historically been a significant cause for international trade disputes, notably leading to allegations of support for Airbus and Boeing and resulting in prolonged proceedings before the World Trade Organization (WTO) Dispute Settlement Body. The dispute between the EU and the USA

over these aircraft subsidies was the longest-running in WTO history, lasting 17 years before an agreement was called in 2021. These state subsidies profoundly impact competition among aircraft manufacturers by enabling new entrants to challenge established market leaders, as demonstrated by Airbus's initial rise against Boeing's previously de facto monopoly during the 90s (Truxal, 2024).

Scholars also contend that the emergence of COMAC as a competitor to the duopoly of Airbus and Boeing signifies a new phase in the global aircraft manufacturing industry. Reshetnikova et al. (2024) argue that COMAC was specifically established by the Chinese government to develop domestic large passenger aircraft and directly challenge the long-standing duopoly of Airbus and Boeing. Its flagship C919 airliner, designed to compete with the Boeing 737 and Airbus A320 in the narrow-body market, along with the CR929 wide-body project, exemplifies China's ambition to secure a significant share of the global commercial aircraft market (Reshetnikova et al., 2024). Olienyk and Carbaugh (2011) similarly argued that, in the near future, the most significant threat to the Boeing-Airbus duopoly in the large aircraft sector, as well as the dominance of Bombardier and Embraer in the regional jet market, is likely to arise from China. The substantial rise in per capita income stemming from the swift economic growth in China is generating considerable demand for air travel domestically. In response, the Chinese government aims to satisfy a significant portion of this demand through the development and production of new regional jets and large commercial aircraft within the country (Olienyk & Carbaugh, 2011).

However, the entrance of COMAC into the global aircraft manufacturing industry also faced challenges. Verduyn (2021) argued that, given the substantial experience and scale advantages possessed by Airbus and Boeing in the production of commercial jets, it is unlikely that China will be able to manufacture an aircraft at a lower cost in the near future. There could be other political reasons behind this, like wanting to be free of foreign companies and a strong sense of national pride. This feeling is clear in the company's seemingly endless supply of money, but the fact that foreign suppliers are hesitant to give COMAC parts is likely to be a big problem. A related challenge to that faced by COMAC is also impacting its supply chain. Li (2018) asserts that the supply chain of COMAC is essential for surmounting the current blockade on core technologies imposed by Western nations, which limits access to vital components and expertise. At the same time, as a newcomer in the global aircraft industry, COMAC faces the challenging task of refining and developing its emerging supply chain systems to improve operational efficiency and reliability (Li, 2018).

According to Eriksson (2017), the commercial aircraft industry in China faces three primary challenges. Initially, there is a deficiency in indigenous technology and the pace of development. This is evidenced by the reliance on foreign technology and suppliers for critical systems, the presence of limited design capabilities, and project delays exemplified by the ARJ21's 14-year development period, which can be attributed to errors and a lack of experience. Furthermore, significant challenges exist regarding regulations and a deficiency of acceptance within the international market. The ARJ21 and C919, both designed in China, face significant challenges in obtaining international airworthiness certification from organizations such as the Federal Aviation Administration (FAA) or European Union Aviation Safety Agency (EASA). This limitation implies that they can exclusively be marketed within China, thereby undermining their global credibility.

Ultimately, the industry is plagued by operational inefficiencies and inadequate management practices. This includes issues such as low productivity levels, an excessive workforce resulting from antiquated management styles, a deficiency in contemporary management and marketing skills, and elevated production costs attributed to taxes on imported components.

Zenglein and Sebastian (2023) also cite the Boeing-Airbus duopoly as a problem. In this scenario, China cannot encourage foreign enterprises to compete for technology. Export controls apply to many commercial aerospace technologies that can be used for civilian and military purposes. The C919's engine requires a US license, and other crucial systems may have similar requirements. This dilemma is exacerbated by US-China geopolitical competitiveness. Thus, foreign aerospace businesses are becoming more cautious about knowledge sharing and collaboration. Concerns about intellectual property threats and technology transfer costs drive this concern.

The C919's supply chain is predominantly dependent on Western technology (illustrated in table 1), as critical components such as the Leading Edge Aviation Propulsion (LEAP-1C) engine, fly-by-wire flight controls, and sophisticated avionics are sourced from American and European firms. Although Chinese companies primarily manufacture the aircraft structure and fuselage, they must collaborate or procure directly from established Western aerospace firms such as General Electric (GE), Honeywell, and Safran to acquire essential propulsion and navigation technology. This architectural reliance exposes the program to significant geopolitical risk, as potential export restrictions or sanctions could hinder access to the specialized components required for aircraft operation. The production feasibility of the C919 poses a challenge to China's strategic objective of attaining complete autonomy in the commercial aviation sector. The C919's ongoing production in China renders it less competitive on the worldwide market.

Table 1. Major Systems and Foreign Supplier Origins of the COMAC C919

Component Category	Component Name	Main Supplier(s)	Country/Region of Origin
Airframe	Fly-by-wire Flight Control System	Honeywell Aerospace	US
	Fly-by-wire Actuation System	Parker Aerospace	US
	Landing Gear	Liebherr LAMC Aviation (JV: Liebherr & AVIC)	Europe and China
	Hydraulic Systems	Parker Aerospace; NEIAS Parker Aero Systems (JV)	US and China
	Wheels, Tires & Brakes	Honeywell Aerospace; Michelin	US
	Fuselage & Empennage	AVIC SAC; Jiangxi Hongdu; Chengdu Aircraft	China
Avionics	Cockpit Control Systems	Eaton Corporation	US
	Navigation & Display Systems	GE Aviation; Honeywell Aerospace	US
	Weather Radar & Sensors	Collins Aerospace	US
	Flight Recorders	GE Aviation Systems	US
Power & Propulsion	LEAP-1C Engine	CFM International (JV: GE and Safran)	US and Europe

	FADEC (Engine Controls)	JV: GE and FADEC International	US and Europe
	Auxiliary Power Units (APU)	Honeywell Aerospace	US
	Thrust Reversers & Nacelles	Nexcelle (JV: Safran & ST Engineering)	Europe and Asia Pacific
	Fuel Systems	Parker Aerospace	US
Materials	Carbon-Reinforced Composites	Hexcel Composites	US
	Aluminum Plate	Aleris Rolled Products	Europe
	Titanium Aluminide Alloy	Alcoa Corporation	US

Source: Airframer (www.airframer.com), compiled by the Center for Strategic and International Studies (CSIS), 2020. https://csis-website-prod.s3.amazonaws.com/s3fs-public/201203_Kennedy_Fig2B_Suppliers_List_v2.pdf

COMAC's Promotion

In 2024, COMAC commenced its international promotional campaign for the ARJ21 and C919 aircraft, signifying a pivotal advancement in its efforts to penetrate the global commercial aviation industry. This ambitious campaign commenced with presentations at notable international airshows, including the 2024 Singapore Airshow. Two C919 and three ARJ21 aircraft manufactured by COMAC participated in the Singapore Airshow held at the Changi Exhibition Centre from February 20 to 25, 2024. COMAC indicated its intention to leverage the event for promotional activities aimed at expanding its client and partner network (Shine, 2024). During the Airshow, COMAC also garnered significant attention with the acquisition of new orders for its aircraft models. Reuters reported that Tibet Airlines and Henan Civil Aviation Development and Investment Group placed substantial orders for COMAC aircraft. Tibet Airlines finalized a purchase agreement for forty C919 single-aisle planes and ten ARJ21 regional jets, while Henan Civil Aviation secured an order for six ARJ21 aircraft (Barrington et al., 2024). Prior to the Singapore Airshow, the C919 made its inaugural flight outside of mainland China during a media event. COMAC has positioned the C919 as a direct competitor to the industry-leading A320 and 737 MAX models produced by Airbus and Boeing, respectively (Al Jazeera, 2024).

Following their debut at the Singapore Airshow 2024, the C919 and ARJ21 aircraft embarked on a regional demonstration tour. The aircraft arrived in Laos on March 4, 2024, for static displays and flight demonstrations. Prior to their arrival in Laos, the jetliners had made a stopover in Vietnam after departing Singapore (Xinhua, 2024). On March 13, 2024, COMAC conducted static displays and demonstration flights of the C919 and ARJ21 aircraft at Sultan Abdul Aziz Shah Airport in Selangor, Malaysia. This event served as a platform for COMAC to showcase its aircraft and engage with potential customers (CGTN, 2024).

COMAC's participation in various airshows held in several countries, including Singapore, Laos, and Malaysia, serves as a promotional effort to introduce its two products. This strategic involvement in international events underscores COMAC's commitment to expanding its market presence and showcasing its technological advancements to a global audience market. By engaging in these airshows, COMAC aims to enhance its brand recognition and establish itself as a competitive player in the international

aerospace industry. These events provide a platform for the company to demonstrate the capabilities and innovations of its aircraft, fostering potential partnerships and customer interest. Furthermore, such activities align with COMAC's broader objectives of penetrating new markets and reinforcing its reputation as a leading aircraft manufacturer.

Through COMAC's engagement with various countries in Asia via partnership agreements and flight programs, such as flight demonstrations at Sultan Abdul Aziz Shah Airport in Selangor, Malaysia, and Laos, as well as marketing campaigns at the Singapore Airshow, the company effectively promotes its C919 and ARJ21 aircraft. The use of these aircraft as aerial displays, including a C919 test flight on the first day of the Airshow, highlights COMAC's commitment to showcasing its technological advancements and expanding its market presence. TransNusa is the first airline to operate the ARJ21 outside of China, and this also demonstrates COMAC's active engagement with Asian countries. Such collaborations not only enhance COMAC's presence in the regional aviation market but also demonstrate the company's ability to forge significant international partnerships.

Therefore, all efforts undertaken by COMAC related to its two aircraft products, the C919 and ARJ21, represent a form of aviation cooperation aimed at expanding its economic reach. These initiatives, including participation in international airshows, partnership agreements, and flight demonstrations, are strategic moves to enhance COMAC's visibility and credibility in the global aerospace market. By promoting its aircraft through these channels, COMAC not only strengthens its market presence but also fosters international collaborations that contribute to its economic growth. This approach highlights the company's commitment to leveraging aviation cooperation as a vital tool for achieving broader economic objectives and establishing itself as a key player in the global aviation industry.

China Aviation Diplomacy through COMAC and Bilateral Agreement

In addition to its economic objectives, COMAC's participation in various airshows held in the aforementioned countries can be examined from the perspective of diplomacy, specifically aviation diplomacy. By engaging in these international events, COMAC not only aims to promote its aircraft but also seeks to strengthen diplomatic ties and foster cooperative relationships with other nations. This form of aviation diplomacy enables COMAC to showcase its technological advancements and manufacturing capabilities, thereby enhancing its reputation and influence in the global aerospace sector. Moreover, this participation highlights the strategic significance of utilizing aviation platforms to attain wider diplomatic objectives, reinforcing COMAC's position as a pivotal entity in global aviation relations.

The role of aviation is vital in strengthening soft power, as it facilitates the overcoming of geographical barriers and promotes interactions among people, communities, and enterprises. concepts, innovations, and prospects (McClory, 2014). COMAC capitalizes on this capability by participating in international airshows and forming strategic alliances. Participation in these airshows allows COMAC to overcome geographical barriers and promote interactions among people, communities, enterprises, ideas, innovations, and opportunities.

Aviation diplomacy encompasses the engagement of emerging diplomatic actors, particularly international aviation organizations and airlines (Kobierecki, 2020). As airlines become crucial actors in aviation diplomacy, the inclusion of the ARJ21 in TransNusa's fleet is particularly significant, as it demonstrates COMAC's growing international recognition. Furthermore, orders from Tibet Airlines and Henan Civil Aviation Development and Investment Group during the Singapore Airshow 2024 underscore COMAC's expanding influence in the global aviation market. These developments reflect the company's strategic efforts to establish itself as a leading player in the international aerospace industry, enhancing diplomatic relations through aviation.

COMAC's involvement in the Singapore Airshow 2024 underscores its strategic focus on aviation diplomacy. Aviation diplomacy involves the use of diplomatic tactics by nations to cultivate a favorable global reputation, often through the utilization of national airlines, airports, and airshows. Through the display of its aircraft at major international gatherings, COMAC not only boosts its brand visibility but also showcases its technological progress to a worldwide audience, a crucial aspect of public diplomacy within the realm of aviation diplomacy.

As a result of aviation diplomacy efforts through airshows and demonstration flights across Asian nations, notable achievements have been made. For instance, in Vietnam, COMAC has established a successful partnership with VietJet, resulting in the signing of contracts for a wet lease (both the aircraft and their crews) of two C909 jets from Chengdu Airlines, effective from January 15, 2025 (Tu, 2024). Following this agreement, a report by Reuters in January 2025 indicated that the Vietnamese government announced its intention to eliminate regulatory barriers to facilitate the operation of aircraft manufactured by the Chinese state-owned planemaker COMAC within the country. Deputy Prime Minister Tran Hong Ha tasked the Ministry of Transport with reviewing and amending existing regulations to allow for the operation of COMAC’s aircraft. This directive was issued subsequent to a meeting in Hanoi between Deputy Prime Minister Ha and COMAC Board Director Tan Wangeng, as stated in a government release (Reuters, 2025).

Beyond the efforts of COMAC to expand the operational footprint of its aircraft, China has simultaneously advanced a parallel regulatory diplomacy strategy through the Civil Aviation Administration of China (CAAC). To facilitate the entry and sustained operation of Chinese-manufactured aircraft in partner states such as Vietnam, Brunei, and Indonesia, the CAAC has pursued bilateral aviation safety arrangements centered on mutual recognition, validation, and acceptance of airworthiness standards.

An examination of the recent regional aviation regulations presented in Table 2 indicates that the Civil Aviation Administration of China (CAAC) is gradually being integrated into foreign legal frameworks. This indicates a significant acknowledgment by regulatory bodies, facilitating the movement of aircraft across national borders. Bilateral validation mechanisms, exemplified by the Working Arrangement between Indonesia's Directorate General of Civil Aviation (DGCA) and the Civil Aviation Administration of China (CAAC), facilitate the acceptance of aircraft by minimizing redundant certification efforts and designating compliance findings in accordance with a mutually agreed-upon List of Differences. The national airworthiness standards, exemplified by Brunei's BAR 8 Part 21, indicate that the Civil Aviation Administration of China (CAAC) is recognized as an

acceptable National Aviation Authority of the State of Design. The aforementioned standards serve to validate Type Certificates and Export Statements of Airworthiness that are issued by the CAAC. The regulations established by customs support these structural airworthiness standards. For instance, Vietnam's Decree 89/2025/ND-CP explicitly permits the importation of aircraft that possess a Type Certificate issued or validated by the CAAC. The implementation of these procedures establishes a unified framework of regulations governing import operations. Their scope encompasses unilateral export airworthiness acceptances, customs updates, and targeted bilateral validations.

Table 2. Aviation Regulatory Diplomacy: Mechanisms for COMAC Aircraft Acceptance in Asia

Regulation or Agreement	**Issuing Authority**	**Legal Basis**	**Mechanism of Recognition**	**Implication for Chinese Aircraft**
BAR 8 Part 21 Certification of Aircraft, Parts and Appliances (Version 02)	Brunei Department of Civil Aviation (DCA)	Civil Aviation Act and Civil Aviation Regulations (CAP 290)	Type Certificate Acceptance Report: Acceptance of Export Statement of Airworthiness.	Grants Chinese aircraft with CAAC Type Certificates a pathway to obtain a Type Certificate Acceptance Report and Certificate of Airworthiness in Brunei.
Working Arrangement on Type Validation and Continued Airworthiness for ARJ21 Airplane	Directorate General of Civil Aviation (DGCA) Indonesia & Civil Aviation Administration of China (CAAC)	Memorandum of Understanding (MOU) signed May 22, 2000	Bilateral Type Certificate Validation based on a List of Differences (LOD), delegating compliance findings to the CAAC.	Streamlines the validation of the ARJ21-700 by minimizing duplicative certification efforts, creating a practical framework for the entry of COMAC aircraft into Indonesia.
Decree 89/2025/ND-CP (Legal Updates April 2025)	Government of Vietnam (Customs)	Decree 89/2025/ND-CP	Customs and trade facilitation measures permitting aircraft importation based on validated type certificates.	Provides a direct regulatory and customs pathway for Chinese-manufactured aircraft (such as the C919) to clear Vietnamese customs legally, facilitating market entry.

Source: Compiled by Author

China has employed aviation regulatory diplomacy as a means to promote the sale of its commercial aircraft to various nations. Strategic bilateral agreements and sector-specific laws are used in this method. Brunei unilaterally adopting CAAC design guidelines and Vietnam simplifying customs operations demonstrate Chinese aviation's credibility. China uses validation procedures like the Indonesia-CAAC Working Arrangement to bring aircraft like the ARJ21 into international markets to increase its worldwide presence. This anticipated growth allows CAAC's technical compliance results to be used immediately for foreign regulatory approval and export airworthiness acceptance, easing cross-border commercial operations. In conclusion, bilateral technical certification and effective

customs facilitation show that targeted regulatory collaboration boosts China's aerospace sector and market access.

Strategic Openings for China in a Disrupted Duopoly

For several decades, the global commercial aviation market has been characterized by a stable duopoly between Boeing and Airbus. The narrow-body aircraft produced by these manufacturers, particularly the 737 and A320 families, have constituted the majority of airline fleets across the globe. However, this duopolistic order has recently faced pressures from various sources, calling into question its perceived invulnerability. The Boeing 737 MAX program has faced significant challenges, including the repercussions of two tragic crashes, as well as persistent regulatory and production difficulties. In early 2024, the U.S. Federal Aviation Administration (FAA) took the step of grounding specific 737-9 MAX jets following an incident involving a mid-air panel. This action was accompanied by the implementation of rigorous inspections and limitations on production expansion, reflecting an intensified focus on safety oversight. Consequently, Boeing is required to address quality-control concerns while simultaneously resuming and adjusting production levels under heightened scrutiny. (Federal Aviation Administration, 2024) The occurrence of concurrent labor disruptions, notably a prolonged strike extending into late 2024, has resulted in additional delays in the resumption of production for the best-selling aircraft. This situation highlights the diminishing operational momentum of Boeing (CNBC, 2024). In the interim, Airbus's flagship A320neo, representing the other segment of the duopoly, has encountered significant production and delivery challenges. Ongoing supply-chain bottlenecks, particularly concerning engine and aerostructure shortages, have compelled Airbus to adjust its forecast for deliveries in 2024 downward and to postpone its timeline for achieving target production rates. Additionally, sustained pressures on monthly outputs and continuous quality inspections of A320 panels have contributed to delays and raised concerns within the industry (Meier, 2024; Reid, 2024). The simultaneous challenges encountered by both manufacturers—regulatory and production constraints at Boeing, coupled with supply-chain and quality issues at Airbus—diminish the previously regarded strong duopoly and highlight the fundamental structural weaknesses within the global narrow-body aircraft supply system.

The disruption of the narrow-body market following program-level crises and supply chain constraints produced measurable operational and financial stress within the Airbus–Boeing duopoly. Prolonged groundings, regulatory production caps, and engine-related bottlenecks translated into delivery backlogs, rising costs, and heightened uncertainty for airlines dependent on predictable fleet expansion cycles.

Between late 2018 and early 2019, events involving Boeing 737 MAX airplanes in Ethiopia and Indonesia led to extensive worldwide scrutiny of U.S. aviation supervision. Following these occurrences, a number of foreign governments, including the geopolitical competitor China and the close ally the United Kingdom, immediately halted operations of the American-made aircraft, rerouting flights of the 737 MAX from British airspace. The swift international response contrasted sharply with Boeing's and the FAA's original response, which was perceived as vague and ambivalent, possibly reflecting a reluctance to take on a major U.S. company. Two days later than other nations, the Federal Aviation

Administration finally grounded the world's fleet of 737 MAX airplanes, a startling delay that demonstrated a decline in confidence in the US aviation regulatory system (Almond, 2019).

Graph 1. Boeing 737 MAX Total Quantity of Orders (2018 - 2025)

Source: Boeing, Orders and Deliveries. https://www.boeing.com/commercial (compiled by author)

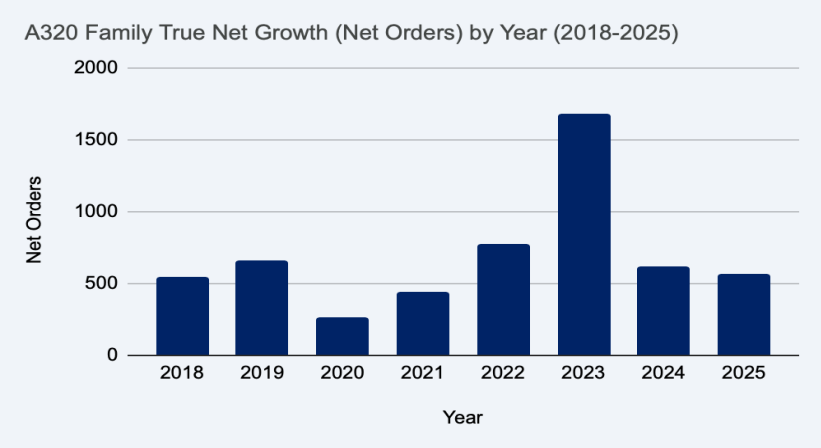
Graph 1 shows how many orders there are for the Boeing 737 MAX in total. The big drop in orders from 2019 to 2020 is a direct result of the loss of trust that followed the two tragic 737 MAX crashes and the grounding of the planes around the world. The big drop in the number of orders shows how much financial and operational stress Boeing is under because of regulatory scrutiny and production delays. Fang (2020) posited that, in this context, a significant window of opportunity has emerged. As Boeing experiences a decline in its market share, it is not solely Airbus that occupies this void; rather, it is non-Western manufacturers with their developing products that are increasingly filling the gap (Fang, 2020).

In contrast, for Airbus, the years 2023 and 2025 presented a set of challenges for the A320 aircraft. In July 2023, RTX Corporation announced a significant manufacturing defect associated with its Pratt & Whitney Geared Turbofan (GTF) engines, particularly the PW1100G-JM model utilized in the Airbus A320neo family. The recall was prompted by the identification of microscopic contaminants in the powder metal utilized in the production of high-pressure turbine disks from 2015 to 2021. This condition has the potential to lead to premature micro-cracking and, ultimately, uncontained engine failure (Walker, 2023). The press release issued by RTX indicates that this uncommon condition in powder metal specifically affects the PW1100 GTF engines, which are utilized in the A320neo aircraft. This situation necessitates expedited inspections and the formulation of a fleet management plan. This plan projects an estimated 600 to 700 additional engine removals for shop visits from 2023 to 2026, predominantly occurring in 2023 and early 2024. This will result in a notable rise in the number of aircraft grounded within the GTF-powered A320 fleet (RTX, 2023).

In the year 2025, Airbus acknowledged a significant challenge related to its A320 Family aircraft, specifically regarding the potential for intense solar radiation to compromise data that is essential for flight control systems. This matter impacts a considerable number of

operational aircraft, leading Airbus to urge operators to undertake immediate precautionary measures. The implementation of available software and/or hardware protection through an Alert Operators Transmission (AOT) is being recommended, which will be further supported by an Emergency Airworthiness Directive from EASA. Airbus recognizes that the implementation of these essential recommendations will result in operational disruptions for both passengers and customers (Airbus, 2025). It has been reported that approximately 6,000 A320 aircraft may be impacted due to this issue (Leggett, 2025).

Graph 2. A320 Family Net Orders (2018 - 2025)

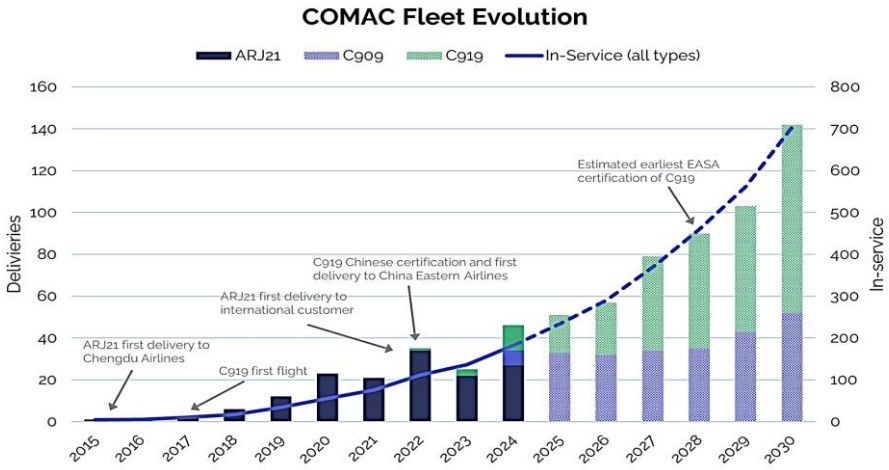


Source: Airbus, Orders and Deliveries https://www.airbus.com/en/products-services/commercial-aircraft/orders-and-deliveries (compiled by author)

Between the years 2023 and 2025, significant and cumulative technical and supply chain challenges impacted the net orders for the Airbus A320 family, as illustrated in Graph 2. The significant decline observed post-2023 can be attributed to RTX Corporation's disclosure in July 2023 regarding a manufacturing flaw in the Pratt & Whitney Geared Turbofan (GTF) engine. The prompt removal and servicing of between 600 and 700 A320neo aircraft engines from 2023 to 2026 resulted in significant groundings and delays in deliveries. In 2025, Airbus recognized a significant concern regarding elevated solar radiation, which heightened operational uncertainty by jeopardizing the data integrity of the A320 Family flight control systems. This situation poses a risk to 6,000 operational aircraft, necessitating immediate precautions and the issuance of an Emergency Airworthiness Directive. The simultaneous occurrence of significant crises concerning engine reliability, flight safety, and regulatory compliance places the company in a position of operational and reputational risk. This led airlines to decrease their new orders, thereby contributing to the decline in the net order total for the years 2023 to 2025. The disruption in the duopoly of Boeing and Airbus concerning narrow-body aircraft presents a strategic opportunity for China to promote its domestically manufactured C919 and ARJ21 jets, thereby positioning COMAC as a viable alternative in the market. The current climate of increased uncertainty, coupled with extended delivery backlogs experienced by industry leaders, presents a pivotal opportunity for the Chinese state-owned enterprise to secure a substantial share of the global market. A report by

International Business Aviation (IBA) indicates that the C919 and C909 are projected to remain particular competitors, constituting approximately 2% of the global fleet by 2030. However, their introduction signifies a notable beginning in contesting the duopoly held by Airbus and Boeing. It is anticipated that, within the domestic market, COMAC's share of new narrow body deliveries to Chinese operators will increase significantly, reaching around 65% by the year 2030. In the short term, COMAC is solidifying its presence within China and is poised to expand judiciously into regional markets, leveraging the C909 as a validated exportable product. Nonetheless, the long-term strategy for the C919 is contingent upon obtaining international certifications such as those from EASA, which are not expected to be achieved before 2028. Should EASA certification be attained and the C929 widebody commence operations as scheduled in the early 2030s, COMAC aspires to evolve into a credible competitor across multiple segments, bolstered by political support and strategic alliances to advance its global objectives (IBA, 2025). According to graph 3, IBA forecasts that COMAC will increase its aircraft delivery rate to 145 per year by 2030, indicating consistent advancement in China's goal to develop an independent commercial aviation industry. IBA's Insight platform indicate that COMAC is projected to deliver 50 aircraft in 2025, increasing to 57 in 2026, 79 in 2027, and approximately 90 in 2028, ultimately reaching 145 by the conclusion of the decade. The C919 narrow body program will predominantly drive deliveries, complemented by the ongoing production of the C909 regional jet and the advancement of the future C929 widebody aircraft (IBA, 2025). The analysis of the forecast and conditions surrounding duopoly disruption indicates that COMAC possesses the potential to secure a substantial share of the global narrow-body market, especially within Asia, by providing an alternative to the problematic Boeing 737 MAX and the supply-constrained Airbus A320 Family. The strategic opportunity enables the Chinese state-owned enterprise to expedite its delivery timeline, with projections indicating an output of 145 aircraft annually by 2030, primarily propelled by the C919 program.

Graph 3. COMAC Fleet Evolution



Source: IBA. (2025, September 17). *COMAC Aircraft Programmes - Status & Outlook*. International Business Aviation (IBA) Group. https://www.iba.aero/resources/articles/comac-aircraft-programmes-status-outlook/

Conclusions

The study findings indicate that the Commercial Aircraft Corporation of China (COMAC), functioning as a state-owned enterprise, is instrumental in China's aviation diplomacy strategy across Asia. This approach utilizes the C919 and ARJ21 aircraft programs as instruments for fostering economic growth in China and enhancing its global influence. The primary method of implementing this plan involves extensive advertising efforts, which encompass participation in significant events such as the Singapore Airshow 2024, as well as conducting demonstration trips in Laos, Vietnam, and Malaysia. The aforementioned initiatives have yielded tangible outcomes, exemplified by TransNusa in Indonesia utilizing the ARJ21 for its inaugural international operation. This marks the inaugural instance of a Chinese-manufactured aircraft being utilized beyond the borders of China. Furthermore, airlines such as GallopAir in Brunei and VietJet in Vietnam have made substantial future orders. The aforementioned results illustrate China's strategic utilization of its expanding aerospace sector to enhance its international relationships and bolster its increasing influence within the global commercial aviation market.

China has employed aviation diplomacy alongside direct sales and marketing initiatives. This is governed by regulations established by the Civil Aviation Administration of China. This entails establishing bilateral aviation safety agreements with Indonesia and Brunei to mutually agree upon and accept standards pertaining to airworthiness. Regulatory diplomacy deals with the structural problem that comes from the fact that the FAA and EASA do not give international certification. In conclusion, the integrated approach that combines COMAC's commercial promotion efforts with the regulatory initiatives of the CAAC establishes civil aviation cooperation as an essential means for China to demonstrate its technological capabilities, soft power, and geopolitical influence in the Asian landscape.

Latecomer powers like COMAC have a strategic opportunity as the Boeing–Airbus duopoly in global commercial aviation faces structural pressure. The Boeing 737 MAX crisis, supply chain interruptions, and certification delays have exposed Western-centered aerospace order weaknesses. China has strategically seen this as a geopolitical turning point, not just a market fluctuation. Beijing is promoting the C919 and ARJ21 through commercial promotion and regulatory diplomacy to present its aircraft sector as an industrial alternative and a normative challenger to certification hierarchies. China is using aviation as a tool of techno-industrial statecraft to reshape global aviation governance, not only for market dominance. COMAC becoming a credible competitor therefore signals more than competitive diversification—it represents a gradual redistribution of technological legitimacy and geopolitical influence within the international civil aviation system.

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