

Peak Insights represent the thought leadership of Portfolio Manager Chris Smith and the Antero Peak Group. Through Peak Insights, the team seeks to offer unique access to innovative leaders and a view into important trends that will impact markets and businesses.

## Aerospace: Consolidated Secular Growth

Our research process is centered around finding broad-based, large, industry-wide inflections that can lead to significant earnings differentiation and sustained changes in valuation multiples. A structural area the team has been focused on is aerospace market growth. As the middle class rises globally, we expect air traffic will accelerate. Further, with years of aerospace industry challenges abating, we see significant tailwinds for aviation companies and believe we are in early innings of a very long upcycle that could easily span well into the next decade.

However, as the market expands, an examination of the supply chain reveals two opposing conclusions. The end market's supply chain is one of the most deeply fragmented we have encountered in any industry, a dynamic that often constrains output. Yet, on the other hand, for those few that deliver products to customers, the industry is extremely consolidated—leaving two airplane manufacturers, and two engine manufacturers. With very little evidence of this dynamic changing, we have a long duration opportunity to deploy our process in these key areas as we navigate economic and political cycles such as the current one.

### The Rise of the Middle Class and Demand Growth

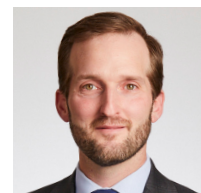
Demand growth for air travel has proven consistent over time, underpinned by a powerful megatrend—the rising middle class and advancement in quality of life. The aerospace industry has exceptionally high barriers to entry based on scale, capital, engineering competence and regulation, behaving rationally from the perspective of a pure industrial cycle. Further, the industry exhibits less production cyclicality than perceived and typically finds itself with backlogs representing over five years of demand.

The underlying cyclicality within aerospace comes almost entirely from external and unforeseeable shocks. What we find interesting is that throughout modern history, the demand growth has shown an impressive tendency to “recouple” back to the long-term trendline after these shocks have taken place. In the past, demand, as measured by revenue generating passenger kilometers (RPKs), has roughly doubled in size. This growth has occurred regardless of “catastrophic” world events and is illustrated over each fifteen-year period below. This demonstrable pattern gives us confidence to deploy our process around these points of inflection.

**Exhibit 1: Demand Growth for Travel Has a Remarkable Ability to Display Consistency through Fragility Events**

15-YEAR SAMPLE	CAGR	DURING THE PERIOD
1970–1985	6.4%	1970s Oil Crisis/Embargo
1985–2000	5.2%	Gulf War and the Asian Financial Crisis
2000–2015	5.1%	9/11, SARS and the Global Financial Crisis
2015–2023E	2.7%	Global COVID-19 Pandemic
2023E–2030E	7.1%	To be determined

Source: Antero Peak Group/Airbus.



Christopher Smith  
Portfolio Manager

20 Years Investment  
Experience

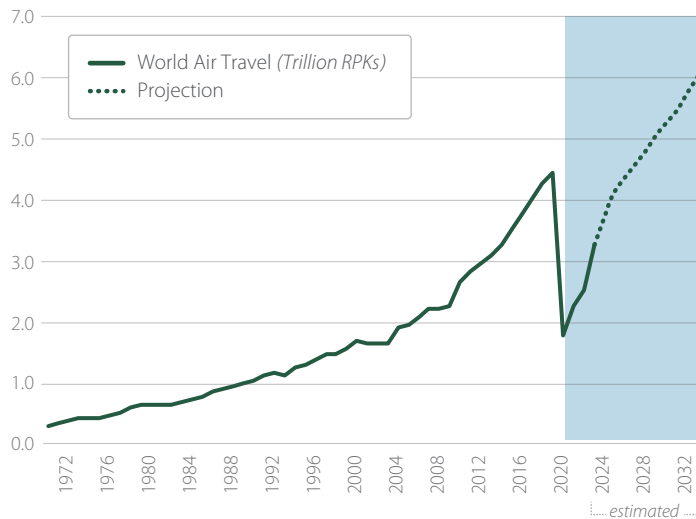


# Peak Insights

While the pandemic was the most destructive to travel patterns in history, we do not think this time around is any different than prior events as the key drivers remain in place. As a result, we identified an above normal rate of growth coming out of the pandemic and allocated capital to our Aero Normalization theme.

We think this cycle is more compelling from a long-term investment perspective than prior ones. This is because three major catalysts occurred within a short period of time that all served to constrain production—as mentioned, the global pandemic, the engineering failure of the original variant of the Boeing 737-MAX, and the subsequent supply chain and skilled labor chaos that is still holding production below demand levels presently.

**Exhibit 2: Global Air Travel Could Begin to See a Long Upcycle of Above Normal Growth**

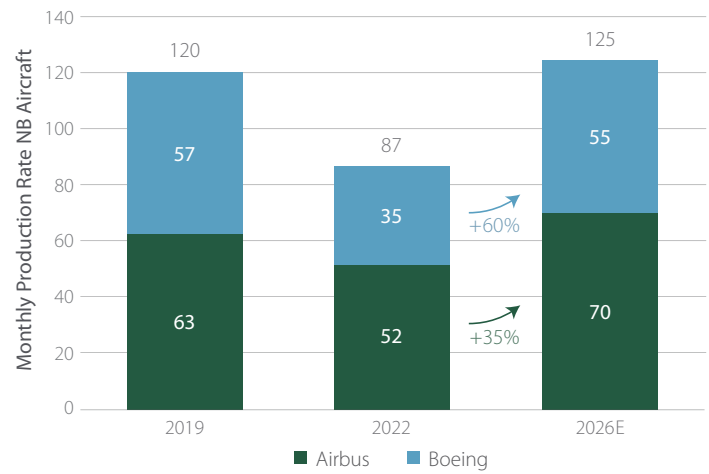


Source: Antero Peak Group/World Bank. As of 24 August 2023. Estimates are based on the team’s analysis and are subject to material revision.

Meanwhile, the current fleet of planes is aging every day. Airbus projects global demand for roughly 41,000 aircraft over the next 20 years all while the total number of aircraft in service doubles. In addition to the rising middle class, we believe upgrades are mandatory for most carriers given that only 25% of the global fleet in service are new generation aircraft. New generation planes display a 20-40% improvement in fuel burn vs. the previous generation. Fuel represents the largest operating cost for many airlines, and these aircraft are needed to stay competitive in the highly price-sensitive industry.

It is also important to note that before we entered the pandemic the industry was undersupplied. The total number of aircraft produced can only again reach the level needed to meet demand by 2026, based on current production forecasts.

**Exhibit 3: Narrowbody Production Faced a Long Period of Sub-Demand Production**



Source: Antero Peak Group/The Airline Monitor. Estimates are based on the team’s analysis and are subject to material revision.

While we will continue, as always, to center investment decisions around differentiation in earnings, we are of the mind that this backdrop overall points to a very long upcycle which has only just begun.

## Engines and Airframes Have Reached an Extreme Level of Consolidation

Further, the industry is quite consolidated. In the simplest characterization, outside of the small regional and business jet markets, there are just two relevant airplane manufacturers and two relevant engine manufacturers for narrowbody aircraft.

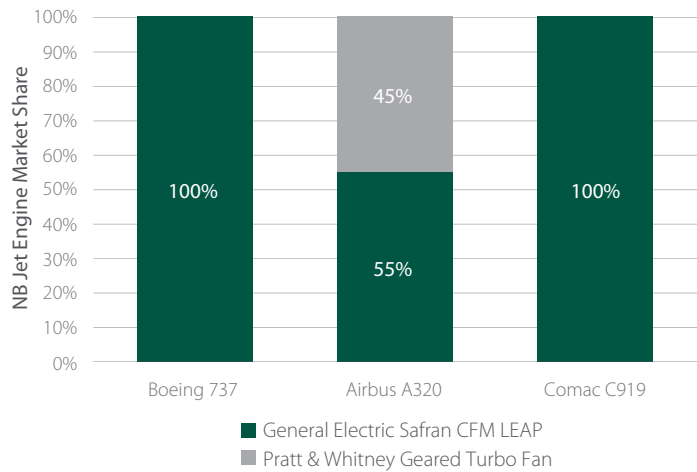
The market overall can be divided into three main categories—regional jets, narrowbody aircraft, and widebody aircraft. The largest category by far is narrowbody aircraft. These single aisle airplanes are the backbones and workhorses of domestic travel in every region and will likely continue to be produced at more than 10X the rate of any other aircraft type today. In this group there are only two major airframe variants available—the Boeing 737 and Airbus A320. The Chinese state-owned and produced Comac C919 as of this writing is only a fringe option given inferior performance, lack of global certification, and very low rates of production. Additionally, all three of these airplanes share just two engine platforms, with the majority using just one.

Airframes themselves have seen very little change in the narrowbody market, with technological progress being driven by one major factor—advances in engine technology. The General Electric/Safran produced LEAP Engine under its CFM joint venture should be in 80% of the market by mid-decade based on production estimates. We think this level of consolidation for critical assembly is quite remarkable.

# Peak Insights

The installed base of these engines is set to expand rapidly, providing engine manufacturers with an ever-building 20+ year service tail of earnings on each engine produced, given no other company outside of GE and Safran can service the part. Today, Boeing and Airbus combined have roughly 10,000 narrowbody aircraft in their backlogs, each of which will likely see regulated service intervals with little-to-no competition for decades to come on their twin engines.

**Exhibit 4: The CFM JV Belonging to General Electric and Safran Is Estimated to Capture ~80% Market Share in Narrowbody Engines by Mid-Decade**



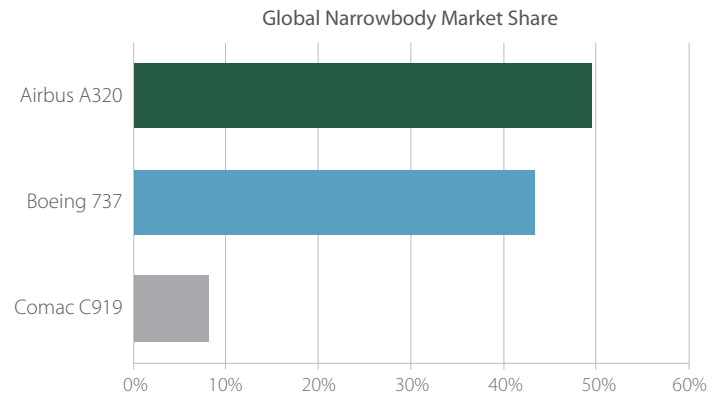
Source: Antero Peak Group. As of 24 August 2023. Estimates are based on the team’s analysis and are subject to material revision.

## Understanding Comac—Risk or Benefit?

To address the third player, Comac is the Chinese state-owned aerospace manufacturer. Its establishment centered around the launch of the C919 program in 2008 as an effort to compete in the narrowbody market with Boeing and Airbus. The first prototype was completed in 2015, but China Eastern Airlines did not put the first airplane into service until June 2023, 15 years after the project began. The aircraft employs primarily Western components and technology, the most important being the GE/Safran CFM LEAP engines. In addition, China has set up numerous joint ventures with Western suppliers for the development including United Technologies Aerospace, Collins, Thales, Honeywell, Moog, and Parker. We continue to expand our understanding of the C919’s airframe and systems, but mostly see the Western supply chain somewhat insulated given Comac’s very high reliance on Western components and engineering.

Yet, a key question going forward is how much a risk to Boeing and Airbus this represents. Over the next decade we foresee the impact being immaterial. Currently China expects production to reach about 150 airplanes designated for the Chinese domestic market by 2028. This target represents about 8% of total global narrowbody deliveries in that year, and we think the target itself is ambitious given the airplane’s significantly lower range and lack of global certification. Further, we believe there are limits to the politicization and dumping practices for the C919 given the program’s heavy reliance on Western components.

**Exhibit 5: Comac Upside Case Still Means Small Share**



Source: Antero Peak Group. As of 24 August 2023. Estimates are based on the team’s analysis and are subject to material revision.

## Summary

Overall, we find the aerospace sector a great place to deploy our process. It is a historically reliable, secular growth market driven by a global rising middle class. This growth presents us over time with unforeseeable “shocks” that often create new inflection points. We think our long-term experience in the sector is an advantage, allowing us to deepen our understanding of the products and challenges. The large capitalization stocks in the industry compete within an extremely consolidated structure with virtually insurmountable barriers to entry. The Antero Peak Group has found many compelling investments in this area so far in 2023 and we will continue to apply our process across the industry as opportunities present themselves.



---

For more information: Visit [www.artisanpartners.com](http://www.artisanpartners.com)

---

**Investment Risks:** Non-diversified portfolios may invest larger portions of assets in securities of a smaller number of issuers and performance of a single issuer may have a greater impact to the portfolio's returns. Use of derivatives may create investment leverage and increase the likelihood of volatility and risk of loss in excess of the amount invested. High portfolio turnover may adversely affect returns due to increased transaction costs and creation of additional tax consequences. Securities of small- and medium-sized companies tend to have a shorter history of operations, be more volatile and less liquid and may have underperformed securities of large companies during some periods. International investments involve special risks, including currency fluctuation, lower liquidity, different accounting methods and economic and political systems, and higher transaction costs. These risks typically are greater in emerging and less developed markets, including frontier markets. Investors investing in strategies denominated in non-local currency should be aware of the risk of currency exchange fluctuations that may cause a loss of principal. These risks, among others, are further described in Artisan Partners Form ADV, which is available upon request.

For the purpose of determining the portfolio's holdings, exposures are delta-adjusted at the issuer level and may include multiple securities of the same issuer. The holdings mentioned above comprised the following percentages of a representative account within the Antero Peak Group's total net assets as of as 30 Sep 2023: General Electric Co 10.0%, The Boeing Co 2.8%. For the purpose of determining the portfolio's holdings, securities of the same issuer are aggregated to determine the weight in the portfolio. Holdings information is not intended to represent or predict portfolio investment performance or as a recommendation of any individual security. Securities referenced may not be representative of all portfolio holdings and holdings are subject to change without notice.

Theme categorizations are at the sole discretion of the team. Themes and constituents are as of the date indicated and subject to change.

**CAGR** represents compound annual growth rate, the year-over-year growth rate over a specified period of time. It is calculated by taking the nth root of the total percentage growth rate, where n is the number of years in the period being considered. **Valuation** is the analytical process of determining the current (or projected) worth of an asset or a company. A **Multiple** is a ratio that is calculated by dividing the market or estimated value of an asset by a specific item on the financial statements.

This material is provided for informational purposes without regard to your particular investment needs and shall not be construed as investment or tax advice on which you may rely for your investment decisions. Investors should consult their financial and tax adviser before making investments in order to determine the appropriateness of any investment product discussed herein.

Artisan Partners Limited Partnership (APLP) is an investment adviser registered with the U.S. Securities and Exchange Commission (SEC). Artisan Partners UK LLP (APUK) is authorized and regulated by the Financial Conduct Authority and is a registered investment adviser with the SEC. APEL Financial Distribution Services Limited (AP Europe) is regulated by the Central Bank of Ireland. APLP, APUK and AP Europe are collectively, with their parent company and affiliates, referred to as Artisan Partners herein. Artisan Partners is not registered, authorized or eligible for an exemption from registration in all jurisdictions. Therefore, services described herein may not be available in certain jurisdictions. This material does not constitute an offer or solicitation where such actions are not authorized or lawful, and in some cases may only be provided at the initiative of the prospect. Further limitations on the availability of products or services described herein may be imposed.

In no event shall Artisan Partners have any liability for direct, indirect, special, incidental, punitive, consequential (including, without limitation, lost profits) losses or any other damages resulting from the use of this material.

This material is only intended for investors which meet qualifications as institutional investors as defined in the applicable jurisdiction where this material is received, which includes only *Professional Clients* or *Eligible Counterparties* as defined by the Markets in Financial Instruments Directive (MiFID) where this material is issued by APUK or AP Europe. This material is not for use by retail investors and may not be reproduced or distributed without Artisan Partners' permission.

In the United Kingdom, issued by APUK, 25 St. James's St., Floor 3, London SW1A 1HA, registered in England and Wales (LLP No. OC351201). Registered office: Reading Bridge House, Floor 4, George St., Reading, Berkshire RG1 8LS. In Ireland, issued by AP Europe, Fitzwilliam Hall, Fitzwilliam Pl, Ste. 202, Dublin 2, D02 T292. Registered office: 70 Sir John Rogerson's Quay, Dublin 2, D02 R296 (Company No. 637966).

**Australia:** This material is directed at wholesale clients only and is not intended for, or to be relied upon by, private individuals or retail investors. Artisan Partners Australia Pty Ltd is a representative of APLP (ARBN 153 777 292) and APUK (ARBN 603 522 649). APLP and APUK are respectively regulated under US and UK laws which differ from Australian laws and are exempt from the requirement to hold an Australian financial services license under the Australian Corporations Act 2001 in respect to financial services provided in Australia.

**Canada:** This material is distributed in Canada by APLP and/or Artisan Partners Distributors LLC, which conduct activities in Canada under exemptions from the dealer, portfolio manager and investment fund manager registration requirements of applicable Canadian securities laws. This material does not constitute an offer of services in circumstances where such exemptions are not available. APLP advisory services are available only to investors that qualify as "permitted clients" under applicable Canadian securities laws.

© 2023 Artisan Partners. All rights reserved.

For Institutional Investors Only — Not for Onward Distribution

A R T I S A N



P A R T N E R S