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Rollie Vincent
JETNET iQ Creator/Director



Never Break the Chain?

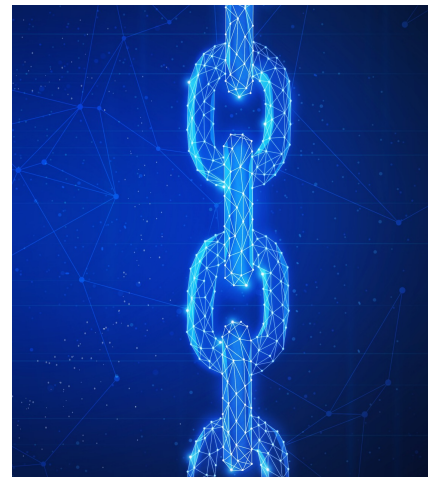
Words mean a lot. And in business aviation, getting the words right can seem challenging at times. Many would agree that business aviation's supply chains are struggling, strained, underperforming, and even broken. Supply chain fixes and workarounds are *de rigueur*, the subject of earnings call references and Wall Street analyst speculations. As we approach another year end and – incredibly – the 4th anniversary of the COVID pandemic, progress towards supply chain recovery is tangle.

Just-released Q3 2023 reports on the industry from GAMA, IADA, and JETNET iQ highlight continuing across-the-board market demand for business aviation's products and services. Pete Bunce, GAMA's President and CEO, eloquently described general aviation's role as "the planet's aerospace technology incubator" in the trade organization's Nov. 21 press release. Wayne Starling, IADA's Executive Director, commented on the rebalancing of supply and demand forces evident in pre-owned aircraft markets, where pricing has begun to correct from its 2022 peaks and availability (for-sale inventory, MRO and FBO capacity). In our latest Q3 2023 JETNET iQ Report, we discuss the cresting of OEM order backlogs and book-to-bill performance, the stabilization of aircraft utilization, and recent improvements in aircraft owner / operator sentiment as we approach what will be a command performance by industry players to close out another busy Q4.

"Pete Bunce, GAMA's President and CEO, eloquently described general aviation's role as "the planet's aerospace technology incubator..."

One of the best-known anthems of British-American band Fleetwood Mac is The Chain, an evocative 1977 ballad that speaks of love, fractured relationships, and the bonds that keep people together in the face of adversity. COVID headwinds knew no barriers, stressing everyone including business and general aviation's most successful enterprises and entrepreneurs. And it stressed supply chains, to and beyond their breaking points, whether in the way aircraft are developed, produced, bought and sold, flown, or maintained. Organizations up and down the supply chain have felt shackled in their abilities to perform to their contractual commitments, in many cases constrained by work processes that are labor-intensive or at least labor dependent.

Today, in the post-COVID world, we are continuing to evolve, working differently, more collaboratively, and more efficiently. In this world, the chains that bound us together are being continuously replaced by flexible fibers woven into intelligent and interconnected networks. In so many unexpected ways, COVID, the Great Accelerator, provides business and general aviation leaders with another impetus to create our safer, greener, and more sustainable future. In this new world, chains are more than likely to be found in the antiquities section of an industrial museum.



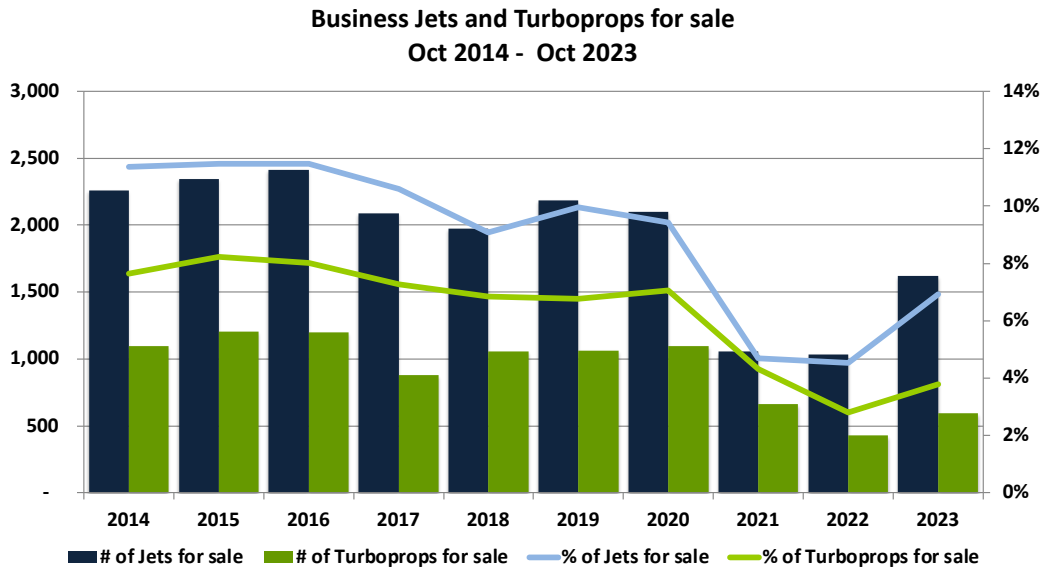
Outlook

Pre-owned business aircraft metrics such as inventory for sale, transactions volumes, and asking prices - or, better yet, “getting” prices - provide very clear and typically early insights into the shifting directions of business aircraft markets. The chart below provides high-level details on the number of business jets and turboprops available for sale at the end of October in the year indicated, as well as the percentage of the fleet that was available for sale. Both the line and bar charts refer to the worldwide fleet. It is interesting to note that the turboprop market experiences comparatively less volatility than the jet segment, with lower peaks and shallower troughs. Turboprop inventory represented just 3.8% of the

worldwide fleet of more than 16,000 aircraft at the end of October 2023. While inventory trends suggest that the overall pre-owned aircraft market is re-balancing, more nuanced analyses can provide rich details that are of importance to buyers and sellers. This includes further segmentation by aircraft model, geography, age of aircraft, owner / operator demographics as referenced by JETNET and JETNET iQ data.

Pre-Owned Business Aircraft Inventory

Number of Aircraft and Percentage of Fleet For Sale (as of End of October) by Year



Aircraft Available for Sale as % of World Fleet (as of October 31)										
	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Business Jets	11.4%	11.5%	11.5%	10.6%	9.1%	10.0%	9.4%	4.7%	4.5%	6.9%
Turboprop	7.6%	8.2%	8.0%	7.3%	6.8%	6.8%	7.0%	4.3%	2.8%	3.8%

Source: JETNET; JETNET iQ analysis

Business Conditions

GDP

The Economist's **GDP growth forecasts** (Nov. 23, 2023) for 2023 are: U.S. +2.4%, Euro Area +0.7%, U.K. +0.4%, Mexico +3.4%, Brazil +3.1%, Canada +1.1%, China +5.5%, Australia +1.9%, and Russia 1.1%



Business jet cycles (take-offs and landings) for Jan.-Oct. 2023 were down by 8.3% YOY for U.S. Part 91, up by 7.9% YOY for U.S. Part 91K, down by 4.2% YOY for U.S. Part 135, and down by 11.4% for European operations



Dow Jones Index (U.S.) was up 4.55%, **FTSE 100** (U.K.) was up 0.19%, **CAC 40** (France) was up 9.42%, and **DAX 30** (Germany) was up 11.44% YOY on Nov. 24, 2023



U.S. Index of Consumer Sentiment was 61.3 in Nov. 2023 vs. 63.8 in Oct. 2023 and 56.7 in Nov. 2022 YOY; **Euro Area Economic Sentiment Indicator** was 93.3 in Oct. 2023 vs. 93.4 in Sep. 2023 and 90.9 in Oct. 2022 YOY



U.S. unemployment rate (seasonally adjusted) was 3.9% in Oct. 2023 representing 6.5 million unemployed people, up 150,000 from Sept. 2023 (3.8%)



U.S. Purchasing Manager Index (Manufacturing PMI) was 46.7 in Oct. 2023 vs. 49.0 in Sep. 2023 and 50.2 in Oct. 2022 YOY; **Euro Area Business Climate Indicator** was -0.33 in Oct. 2023 vs. -0.35 in Sept. 2023 and 0.78 in Oct. 2022 YOY



Transactions of pre-owned business aircraft in the first 9 months of 2023 were 1,661 jets and 857 turboprops, down 28% and 29% respectively YOY (JETNET as of Nov. 1, 2023; whole retail transactions only)



Business aircraft deliveries in 2023 YTD were 496 jets (including Cirrus and Boeing / Airbus single-aisle) and 283 turboprops (Source: JETNET through Nov. 26, 2023)

Business Aircraft OEM Book-to-Bills

Book-to-bill performance at the 5 largest business aircraft manufacturers have been rising and falling in tandem over the past several years. A measure of aircraft order and delivery performance, a book-to-bill ratio of 1-to-1 reflects a situation where order value (as measured, for example, by new contracts being written) is well matched with the value of aircraft deliveries in each period. A 1-to-1 book-to-bill implies that an aircraft manufacturer's firm order backlog has remained stable in a period.

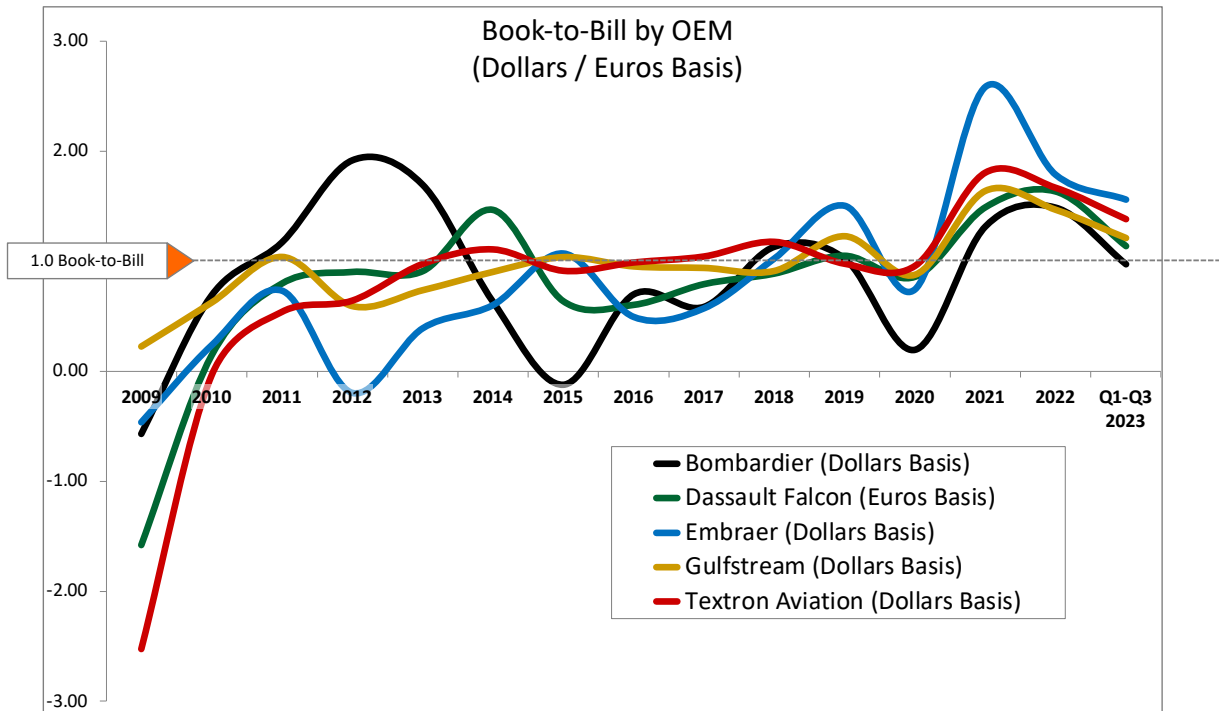
While rising backlogs (reflected in book-to-bill ratios above 1-to-1) are often viewed as a positive performance indicator

(i.e., sign of strong orders), they can alternatively reflect supply-side factors that could be constraining a manufacturer's deliveries. But which is it?

Understanding the details behind the headlines is key to making sense of the shifting forces that are driving today's market. Now in our 13th year of continuous publication, our quarterly JETNET iQ Reports are available as a subscription service to provide you with timely analyses, unique insights, and proprietary forecasts to help our customers make better informed decisions about the state of business aviation.

Book-to-Bill Performance

"Top 5" Business Aircraft Manufacturers



Source: Regulatory filings, company reports, JETNET iQ analyses and estimates; note that Gulfstream results reflect the performance of General Dynamics' Aerospace division, which includes both Gulfstream Aerospace and Jet Aviation

Securing Business Aircraft Flight Operations

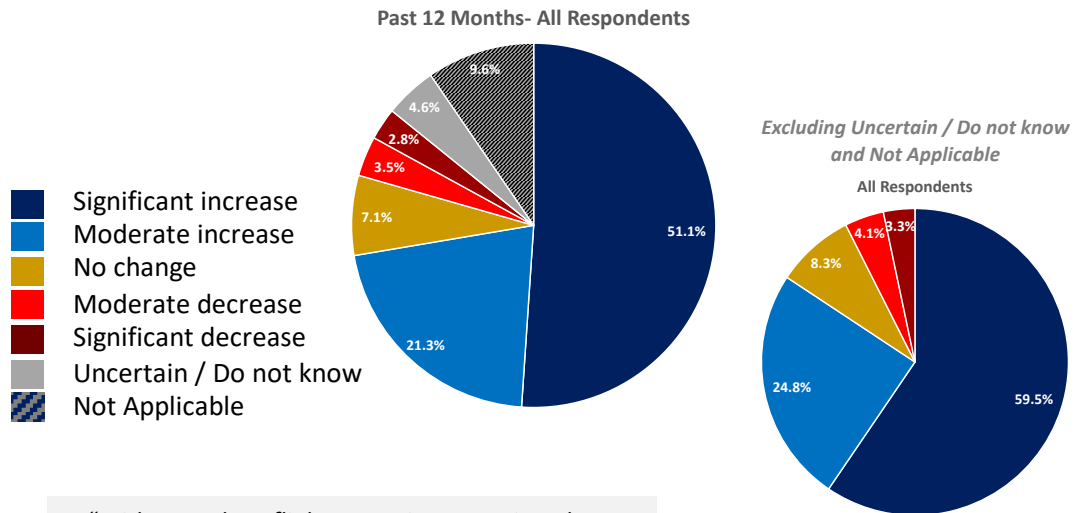
Many business aircraft owners and operators have felt compelled to increase their investments in aircraft security in recent years, in part due to several high-profile attacks on aircraft by what some refer to as “eco-terrorists”, particularly in Europe. EBACE 2023 in Geneva will long be remembered for the attacks by protesters who managed to break through the fencing at Geneva International Airport. While physical damage to aircraft was limited, protesters managed to make their mark by handcuffing themselves to airplanes and bringing along their own video and photography crews to record and rebroadcast their attacks in near real-time.

against innocent people and/or their property in the pursuit of an environmental objective. More than half of the Q3 2023 JETNET iQ Survey respondents indicated that they and/or their organizations have significantly increased their business aircraft security-related investments over the past 12 months. Excluding those who were uncertain or who indicated that they did not know, the proportion of respondents rose to almost 60%. Relative to commercial airliners, business and general aviation aircraft are particularly vulnerable to attack on the ground given their lower utilization combined with typically less stringent B&GA airport security.

Eco-terrorism is defined as acts of violence committed

Flight Operations Security

Q3 2023 JETNET iQ Survey – Investment Actions Over the Past 12 Months



“With regards to flight operations security, please indicate which of the following most applies to your investment actions over the past 12 months”

Source: Q3 2023 JETNET iQ Survey

High Watch: The Economy

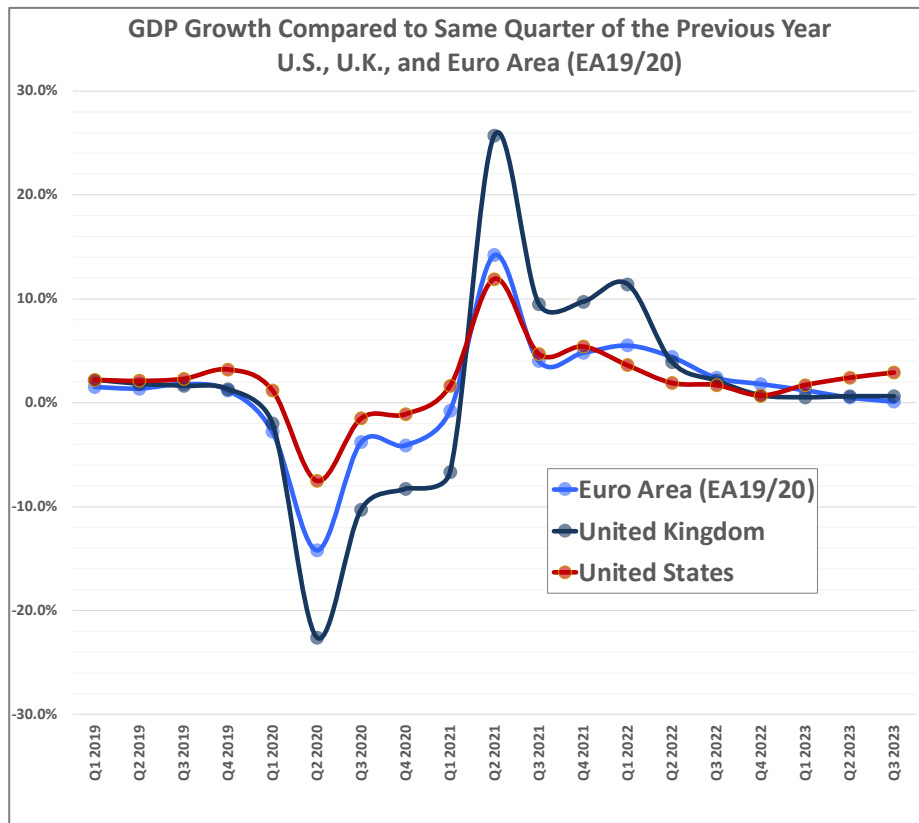
The COVID-induced V-shaped recession in Q2 2020 hit different regions and different business sectors differently. In the U.S., GDP plummeted to an annualized growth rate of -7.5%, a shock after 42 consecutive quarters of year-over-year (YOY) growth. We now know that the economic shock of COVID-19 was the largest peacetime setback to the U.S. economy since the Great Depression of the 1930s. In the 20-nation Euro Area, the COVID shock was even more profound, with the EA20 countries experiencing a -14.2% YOY collapse in their combined economies in Q2 2020. Buffeted by the combination of COVID and Brexit uncertainties, the U.K. economy plunged to a -22.6% growth rate YOY, a shock that still reverberates as it does in other

parts of the world.

While growth rates in 2021 and the immediate aftermath of COVID reflect the “easy comparable” of the Year 2020, U.S. GDP performance has diverged from Europe and other advanced economies so far in 2023, outperforming most pundit’s forecasts. Supply-side policy support, strong labor markets, continued consumer spending, and steady progress in lowering inflation have all aligned to support U.S. economic growth this year. The Year 2024 brings considerable uncertainty with flaring geo-political tensions, high interest rates and highly leveraged borrowers, and another contentious U.S. Presidential election.

GDP Growth Rates – Select Key Markets for Business Aviation

From Q1 2019 Through Q3 2023



Sources: Sources: U.S. BEA, Eurostat, U.K. ONS

About JETNET iQ

JETNET iQ is a business aviation market research, analysis and forecasting service consisting of three main elements:

- **JETNET iQ Reports** are the definitive analytical reference for business aviation, incorporating quarterly state-of-the-industry analyses, owner / operator surveys, and detailed delivery and fleet forecasts;
- **JETNET iQ Summits** are annual industry thought-leadership conferences providing unique data, insights and networking opportunities; and
- **JETNET iQ Advisory** provides customized research and analysis for clients on a project-by-project basis.

JETNET iQ Reports are available in various formats on a subscription basis, and are published regularly by JETNET LLC, 101 First Street, Utica, NY 13501 - **currently offered at 11 different levels**. JETNET iQ is a partnership between JETNET LLC of Utica, New York and Rolland Vincent Associates, LLC, of Plano, Texas.

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Since late 2010, JETNET has conducted quarterly surveys of the worldwide community of business aircraft owners and operators to gauge customer sentiment, brand perceptions, aircraft purchase, selling, and utilization expectations, and other factors. JETNET iQ Global Business Aviation Surveys are password-protected and by invitation-only. Potential respondents are drawn randomly from the JETNET worldwide database of business jet and business turboprop owners and operators; they are initially contacted by telephone and/or e-mail by JETNET's team of multilingual researchers. Target respondents include chief pilots, directors of aviation, and senior management. Each survey is targeted to include ~400-500 respondents in ~50+ countries each quarter, and respondents closely reflect the worldwide distribution of the business jet and turboprop community.

For more information on JETNET iQ, please contact:

Rolland Vincent, JETNET iQ Creator/Director
Tel: 1-972-439-2069
e-mail: rollie@jetnet.com

To subscribe to JETNET iQ Reports or inquire into sponsorship of JETNET iQ PULSE, please contact:

Paul Cardarelli, JETNET Vice President of Sales
Tel: 315-797-4420, ext. 254
e-mail: paul@jetnet.com