

Private Bank



Aircraft Market Update

Newsletter
Winter 2017



Welcome to the winter issue of Citi Private Bank's Aircraft Market Update. We recently attended the National Business Aviation Association's (NBAA) annual convention & exhibition, which was held in November in Orlando and, although there was not much change overall in the aviation industry, we present some candid insights and highlights, as well as take a closer look at Gulfstream's all new G500.

2016 NBAA Annual Convention & Exhibition

As anticipated, there were no major new program announcements from the manufacturers, but the NBAA provided an opportunity to hear the latest aviation industry intelligence on why recovery appears stalled, especially in the large cabin segment.

As 2016 has come to an end, most business aviation industry experts see the market for small and medium size jets stabilizing in 2017, but a similar improvement in the large-cabin sector is still 2 - 3 years off.

There is a consensus that North America, led by the US, is the region where activity and interest in buying and selling business aircraft can be described as healthy. As a corollary to that sentiment, activity throughout the rest of the world is stagnant and there is simply too much pre-owned large-cabin inventory to be absorbed by the US alone.

So, what else is contributing to the business aircraft doldrums?

The following three factors still persist:

Extreme Manufacturer Discounting

Bombardier, cash-strapped by delays in the C-Series airliner, led the way with Gulfstream and Dassault following suit. While this helps sales, it obviously has had an extremely negative impact on the pre-owned market.

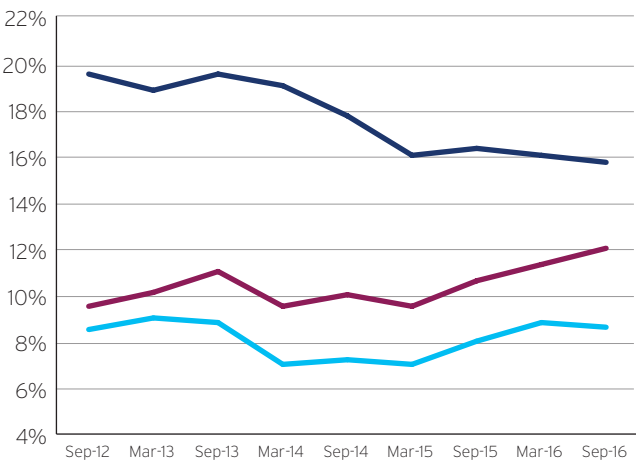
China's and other BRIC Countries' Cooling Economies

When the Chinese economy was going strong, the manufacturers experienced a period of robust sales that soon evaporated, leaving them with dozens of "white tails" – aircraft completed but with no buyer – to be sold at deep discounts.

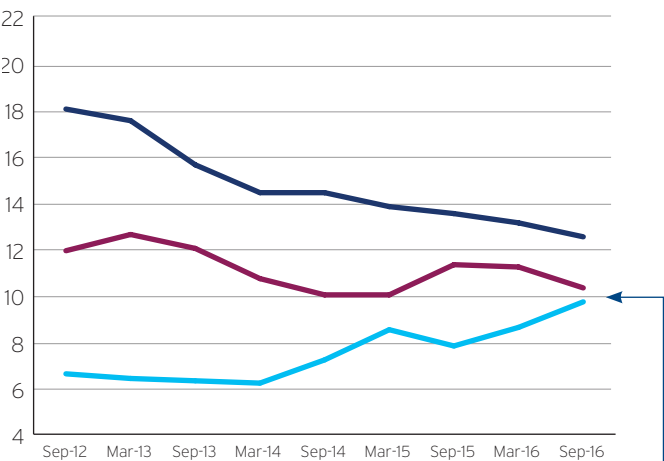
New Models

Despite a sluggish market, the Original Equipment Manufacturers (OEMs) are compelled to stay technologically relevant by bringing new models to market featuring more range, larger cabins and state-of-the-art avionics. As a result, the models they are designed to replace fall into relative obsolescence accompanied by sinking values. While the combined effect of these three factors is mixed in the "medium/super-mid-size" category, it is, unfortunately, most severely felt in the "heavy" jet sector - the large-cabin, long-range models that command the most money. As evidenced by the charts below, while the percentage of older and middle aged jets in the heavy category has, for the most part, declined over the past four years, the percentage of newer heavy jets has continued to rise.

Medium/Super-Mid-Size Jets
% for Sale by Age



Heavy Jets
% for Sale by Age



Legend - Age of Aircraft	
—	Old (>20 Yrs)
—	Middle (11 Yrs - 20 Yrs)
—	New (10 Yrs or Less)

The for-sale inventory of newer, large-cabin aircraft continues to rise.

Source: AMSTAT, November 2016

News from the Manufacturers at NBAA

Dassault

Shortly before the convention opened, Dassault announced the first customer delivery of its new 6,450nm Falcon 8X (a fully-completed 8X was on display at the convention). The feeling is Dassault may soon drop the slightly smaller 5,950nm Falcon 7X from its lineup.

Although the first test Falcon 5X vehicle was rolled out in Merignac, France in June 2015, issues with Snecma's Silvercrest engine have delayed the program by approximately 18 months with entry-into-service now pushed back to late-2019 or 2020.



Source: Dassault Falcon Jet Corp.

Gulfstream

Gulfstream officially announced the end of the hugely successful G450 program with the last customer delivery slated for early 2018. With flight testing of the new 5,000nm G500 well underway (see Model Highlight Synopsis on page 4), entry-into-service has been moved up from early 2018 to late 2017. Milestones for the larger, 6,200nm G600 are on schedule for close to a year behind the G500. Speculation is that, like the G450, Gulfstream will discontinue the G550 once the G600 is ready to enter the market.



© Gulfstream Aerospace Corporation

Bombardier

The long-awaited first flight of Bombardier's 7,400nm Global 7000 finally took place on November 4th. This "clean sheet" design will be the largest of all business jets and will feature four-zone seating and state-of-the-art systems. Entry into service is targeted for late 2018.

Rumors abounded concerning a re-engined Global 5000 and 6000, providing 3% to 5% range improvements but no official announcement was made.



Source: Bombardier Inc.

Cessna

Announced at the 2015 convention, more detail emerged this year regarding Cessna's largest jet. Engine selection will be the same Snecma Silvercrest chosen for Dassault's Falcon 5X. Assuming the development issues delaying the 5X program by two years are resolved, the Hemisphere scheduled first flight of late 2019 should not be impacted. Features will include 4,500nm range, Thales fly-by-wire flight controls and Honeywell Primus Epic avionics.



Source: Textron Aviation, Inc.

Model Highlight Synopsis

Gulfstream G500

On October 21, 2016, Gulfstream announced the end of production for the hugely successful G450, the last model in a line that began in 1986 with the GIV, continued in 1993 with the follow-on GIV-SP and, from 2005 through 2016, the G450 - an amazing run of over 870 aircraft with over 840 still in service! However, the announcement of the production halt came as no surprise to the business aviation community ever since Gulfstream launched the all-new G500 program at the NBAA convention in 2014.

Technical Highlights

- **Range/Operating Speed** - Using elements of the Gulfstream flagship G650's supercritical airfoil, the G500 is designed for economy cruise speed at Mach 0.85 (versus the seemingly now-outdated Mach 0.80), the new standard for the next-generation, large-cabin business aircraft. Non-stop city pairs will include Seattle < > Tokyo, Los Angeles < > London and Montreal < > Rio de Janeiro. At high-speed cruise (Mach 0.90), the G500 can fly between Paris and New York in about 6 hours, depending on winds aloft.



© Gulfstream Aerospace Corporation

Gulfstream G500 Range from Teterboro (TEB), New Jersey



© Gulfstream Aerospace Corporation, December 2016
All performance is based on preliminary data and subject to change.
Theoretical performance based on the noted assumptions.
Actual performance will be affected by ATC routing, operating speed, weather, outfitting options and other factors.

- **New Engines** - The G500 will be the first Gulfstream not to be powered by a Rolls-Royce engine. Instead, propulsion will be provided by two Pratt & Whitney Canada PW814GA PurePower turbofans, each capable of 15,114lb of take thrust at temperatures up to ISA+15°C. These engines allow the G500 to fly 18% farther and almost 30kt faster than the G450 with essentially the same fuel burn and substantially reduced carbon emissions.
- **Redesigned Cabin** - The interior will offer 2in more headroom, 7in more width at elbow height when seated and 8in more width at floor level than the G450. Net available cabin length is 4.5ft longer and usable baggage volume is increased to 175 cu ft. Windows are 16% larger (G650-size) and a seventh cabin window has been added on each side.
- **Avionics** - The new G500 will feature the Symmetry flight deck, Gulfstream's most advanced cockpit to date. It will be the first civil aircraft to be equipped with "active" sidesticks: move one and the other moves as though the two were tied together. Now, each pilot is immediately aware of any inputs by the other or by the autopilot. Ten touchscreen controllers slash the number of physical switches in the cockpit, automate many functions and provide unparalleled redundancy.

Following first flight on May 20th, 2015, the G500 is now in the midst of a rigorous flight test/certification program. All must be going very well since Gulfstream just moved the G500 entry-into-service date up from early 2018 to late 2017. According to Gulfstream, acquisition cost is approximately \$44.65MM.

Summary

Despite the continuing challenges in the business aviation industry, ultra high net worth individuals need, and want, private aircraft for both business and pleasure. Potential buyers can take advantage of weak pricing as there are bargains to be had.



© Gulfstream Aerospace Corporation



© Gulfstream Aerospace Corporation

John Basileo
Tel: (212) 559-1894
john.basileo@citi.com

Citi Private Bank Aircraft Finance
153 East 53rd Street, 23rd Floor
New York, NY 10022

Citi Private Bank is a business of Citigroup Inc. ("Citigroup"), which provides its clients access to a broad array of products and services available through bank and non-bank affiliates. Not all products and services are provided by all affiliates or are available at all locations.

All dollar amounts are denominated in US Dollars.

All credit products are subject to credit approval. Nothing contained herein is a commitment to lend by Citibank, N.A. or an affiliate.

The views expressed herein are those of Citi Private Bank Aircraft Finance and do not necessarily reflect the views of Citigroup Inc. or its affiliates. All opinions are subject to change without notice.

This document is for information purposes only. All opinions are subject to change without notice. Opinions expressed herein may differ from the opinions expressed by other businesses of Citigroup Inc., are not intended to be a forecast of future events or a guarantee of future results. Although information in this document has been obtained from sources believed to be reliable, Citigroup Inc. and its affiliates do not guarantee its accuracy or completeness and accept no liability for any direct or consequential losses arising from its use.

In Canada, Citi Private Bank is a division of Citibank Canada, a Schedule II Canadian chartered bank. Certain investment products are made available through Citibank Canada Investment Funds Limited ("CCIFL"), a wholly owned subsidiary of Citibank Canada.

Citibank N.A., London Branch (registered branch number BR001018), Citigroup Centre, Canada Square, Canary Wharf, London, E14 5LB, is authorised and regulated by the Office of the Comptroller of the Currency (USA) and authorised by the Prudential Regulation Authority. Subject to regulation by the Financial Conduct Authority and limited regulation by the Prudential Regulation Authority. Details about the extent of our regulation by the Prudential Regulation Authority are available from us on request. The contact number for Citibank N.A., London Branch is +44 (0)20 7508 8000.

Citibank Europe plc is regulated by the Central Bank of Ireland. It is authorised by the Central Bank of Ireland and by the Prudential Regulation Authority. It is subject to supervision by the Central Bank of Ireland, and subject to limited regulation by the Financial Conduct Authority and the Prudential Regulation Authority. Details about the extent of our authorisation and regulation by the Prudential Regulation Authority, and regulation by the Financial Conduct Authority are available from us on request. Citibank Europe plc, UK Branch is registered as a branch in the register of companies for England and Wales with registered branch number BR017844. Its registered address is Citigroup Centre, Canada Square, Canary Wharf, London E14 5LB. VAT No.: GB 429 6256 29. Citibank Europe plc is registered in Ireland with number 132781, with its registered office at 1 North Wall Quay, Dublin 1. Citibank Europe plc is regulated by the Central Bank of Ireland. Ultimately owned by Citigroup Inc., New York, USA.

In Jersey, this document is communicated by Citibank N.A., Jersey Branch which has its registered address at PO Box 104, 38 Esplanade, St Helier, Jersey JE4 8QB. Citibank N.A., Jersey Branch is regulated by the Jersey Financial Services Commission. Citibank N.A. Jersey Branch is a participant in the Jersey Bank Depositors Compensation Scheme. The Scheme offers protection for eligible deposits of up to £50,000. The maximum total amount of compensation is capped at £100,000,000 in any 5 year period. Full details of the Scheme and banking groups covered are available on the States of Jersey website www.gov.je/dcs, or on request.

For South African clients: Financial Service Provider, FSP 30513. In the United Arab Emirates and Bahrain Citi Private Bank operates as part of Citibank NA.

In Hong Kong, this document is issued by CPB operating through Citibank, N.A., Hong Kong branch, which is regulated by the Hong Kong Monetary Authority. Any questions in connection with the contents in this document should be directed to registered or licensed representatives of the aforementioned entity.

In Singapore, this document is issued by CPB operating through Citibank, N.A., Singapore branch, which is regulated by the Monetary Authority of Singapore. Any questions in connection with the contents in this document should be directed to registered or licensed representatives of the aforementioned entity.

© 2017 Citigroup Inc. All Rights Reserved. Citi, Citi and Arc Design and other marks used herein are service marks of Citigroup Inc. or its affiliates, used and registered throughout the world.