



White Paper

Why Are Airlines Leasing More Aircraft?

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I. The Role of Operating Lessors

Globally, airlines operate a fleet of more than 27,000 commercial jet aircraft valued at over \$696 billion (active and parked aircraft). Airlines rely heavily on third-party debt and equity to finance these capital-intensive assets. Third-party equity to finance the aircraft has increasingly been provided to the airline industry by aircraft operating lessors which acquire and lease aircraft to airlines as their lessees.

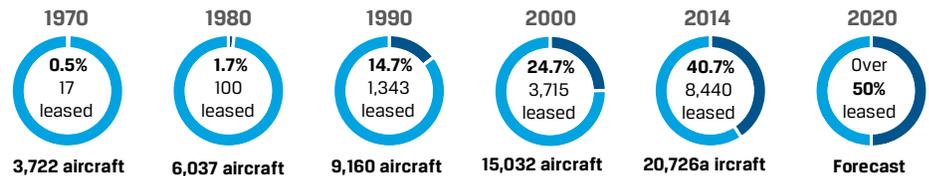
Today, over 13,300 commercial jet aircraft, valued at approximately \$331 billion, are owned by operating lessors and leased on this basis to the global airlines, representing more than 49% of the fleet by value.

An aircraft operating lease is a contract that permits airlines to use, operate and maintain the aircraft, but does not provide the lessee with ownership rights in the asset. For the lessor, the aircraft subject to lease are accounted for as assets and depreciated as such. For lessees, accounting has historically been off-balance sheet, without the recording assets or liabilities, which can improve financial ratios. An operating lease must not (i) transfer ownership to the lessee, or (ii) provide the lessee with bargain purchase options.

Under an operating lease, the lessor retains the risks and rewards of ownership, with the aircraft returned to the lessor at the end of the lease term such that there is no residual value interest, or exposure, for the lessee. Operating lessors rely on their ability to arrange several consecutive leases, and to sell the aircraft eventually, in order to cover their cost of capital and generate returns. The long-term competitiveness of the largest aircraft lessors is driven to a significant extent by aircraft purchase prices and financing costs as well as their agility in placing and trading aircraft.

Boeing Capital's latest forecast projects operating leasing will account for 50% of the in-service fleet by the end of this decade. With over 19,000 commercial jet aircraft needed by 2025, several sources of financing will be required to meet that volume, and lessors are expected to provide a significant portion of the financing required.

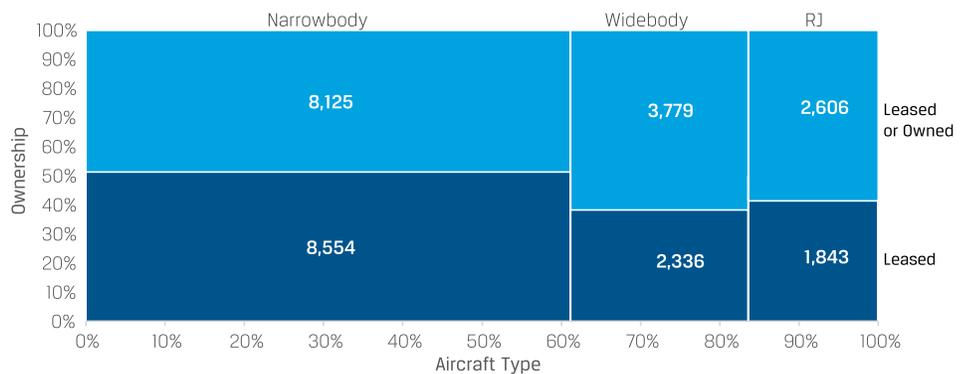
EXHIBIT 1. EVOLUTION OF OPERATING LEASE PENETRATION BETWEEN 1970 AND FORECAST BY 2020



Note: Active fleet includes narrowbody, widebody, and regional jets in commercial service.
 Excludes Russian-manufactured aircraft.
 Source: Boeing Capital Corporation 2014 Outlook

Operating leases, although more dominant for narrowbody jets at 51% leased (by volume), have also penetrated the regional jet (41%) and widebody segments (38%).

EXHIBIT 2. VALUE DISTRIBUTION OF GLOBAL JET FLEET BY AIRCRAFT TYPE AND OWNERSHIP (# OF AIRCRAFT)



Note: Includes narrowbody, widebody, and regional jets (RJ) that are in service or inactive.
 Source: ICF Analysis, CAPA, November 2017.



According to Sylvain Bourdain, Professor of Corporate Finance, and Catherine Muller-Vibes, Professor of Industrial Organization at the Toulouse Business School, in their paper, "Leasing and Profitability: Empirical evidence from the airline industry" and based on 73 airlines examined between 1996 and 2011, the ideal mix between leasing and owning aircraft for airlines is at 53.5% of the fleet on lease. This percentage is higher for low cost carriers and younger airlines as their access to aircraft purchase is more limited.

II. Growth in Number of Lessors

Established over 40 years ago by Tony Ryan (GPA) and Steve Udvar-Hazy (ILFC), and then refined by GECAS and ILFC in the 1990s, the aircraft operating lease industry has evolved to become a highly sophisticated and major segment of the commercial aviation landscape.

Historic aircraft operating lease penetration rate have grown from 0.5% in 1970 to approximately 41% in 2014, and is now the largest single source for financing new deliveries, at nearly 47% of the global fleet by volume.¹ This represents an average annual growth rate for the leasing sector of approximately 15%, compared to overall fleet growth of 4% over the same period.

The operating leasing industry has increased by a third in the past 10 years. With only about 9,300 aircraft on operating lease in 2009, the industry has grown to about 12,700 in 2017. Furthermore, the number of large lessors, with a fleet value of over \$1 billion, has also grown to become more than double that of 10 years ago.

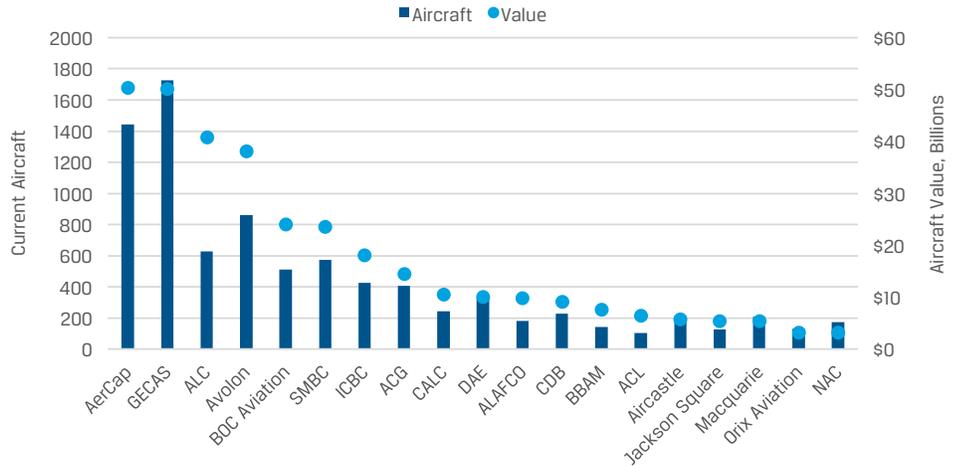
Led currently by GECAS and AerCap, a large number of lessors are involved in the sector. Despite a recent increase in merger and acquisition activity and consolidation in the sector, it remains relatively fragmented. The sector has and should continue to attract additional participants looking for competitive risk-adjusted returns on stable assets, many backed by new investors.

Evidence stems from a growing number of new leasing companies entering the aircraft leasing industry and amassing significant portfolios relatively quickly. Nonetheless, achieving scale in the sector is more challenging and while there has been a significant level of consolidation, the emergence of many new Chinese lessors has added to the fragmentation of the market.

¹ Source: Boeing Capital Corporation 2014 Outlook, CAPA, November 2017. Active fleet includes narrowbody, widebody, and regional jets in commercial service or parked

While there are more than 70 aircraft lessors with more than 25 aircraft in their portfolio, the 10 largest lessors, as measured by value of their current fleet, have aircraft portfolios valued at nearly \$150 billion, equal to nearly 50% of the total leased aircraft fleet, while the top 20 leasing companies own nearly 85% of the leased fleet.

EXHIBIT 3. TOP 20 OPERATING LESSORS (BY VALUE OF FLEET AND ORDERS)



Source: ICF Analysis and CAPA September 2017. Note: Includes in service and inactive, narrowbody, widebody, and regional jets that are subject to operating lease. Excludes unknown and undisclosed lessors. Orders include only firm orders.

*Avolon includes CIT and HKAC/HKIAL.

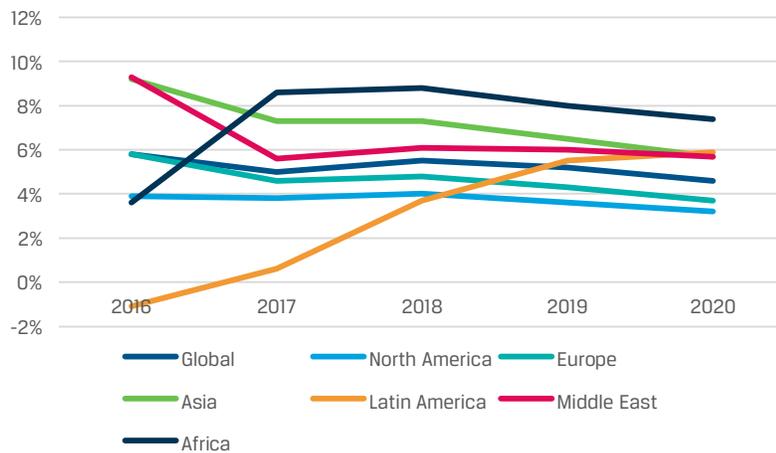
*AWAS is now part of DAE

III. Growth in Number of Aircraft

The demand for aircraft and aircraft operating leasing is ultimately driven by growth in air traffic. Air traffic growth in turn drives the airlines' revenues and ultimately cash flows, which are utilized in part to pay ownership costs for the aircraft, whether owned or leased.

Demand for new aircraft is determined by two primary factors, the need to replace older, less efficient aircraft and the need to accommodate increases in demand for air travel. Since 2011 airline traffic, as measured by growth in revenue passenger miles ("RPMs") has exhibited healthy gains, and as a result, airlines have ordered substantial numbers of new aircraft to meet this demand.

EXHIBIT 4. AIR PASSENGERS ANNUAL FORECASTED GROWTH RATE



Source: IATA, Air Passenger Forecasts, 2016

The current trend in traffic growth is expected to continue over the near term, with strong traffic growth, anticipated to accelerate between 2017 and 2018 and slow down in 2019-2020. Regionally, traffic growth is expected to be uneven ranging between 3.5% and 7.8% through 2020. The strongest growth is expected in Africa, Asia, the Middle East, and Latin America. The overall world trend is forecasted around the 4.8% average through 2020.

Aircraft orders have created an all-time high backlog for aircraft manufacturers. Boeing and Airbus have a combined backlog of more than 12,000 aircraft, and a wait of up to seven years for the most popular types. Both the narrowbody and widebody fleets have experienced accelerated deliveries since 2011. Boeing is forecasting a 3% increase by value of aircraft deliveries in 2017 compared to 2016. Of the total deliveries, lessors have increased their portion to about 45%. Boeing reports that 49% of its deliveries to lessors are direct purchases and 51% are through sale-leasebacks.

Boeing forecasts deliveries of 41,030 jet aircraft (including regional jets) between 2017 and 2036, while Airbus forecasts 34,900 deliveries (excluding regional jets). With the rise of aircraft demand, aircraft financing volumes will also increase and will be provided by cash, commercial bank debt, capital markets, export credit financing, and leasing. According to Boeing, airline capital investment has doubled between 2010 and 2016 with aircraft capital spending accounting for the majority of the spending. Aircraft capital spending, which was at \$122 billion in 2017 is expected to reach \$189 billion in 2022.

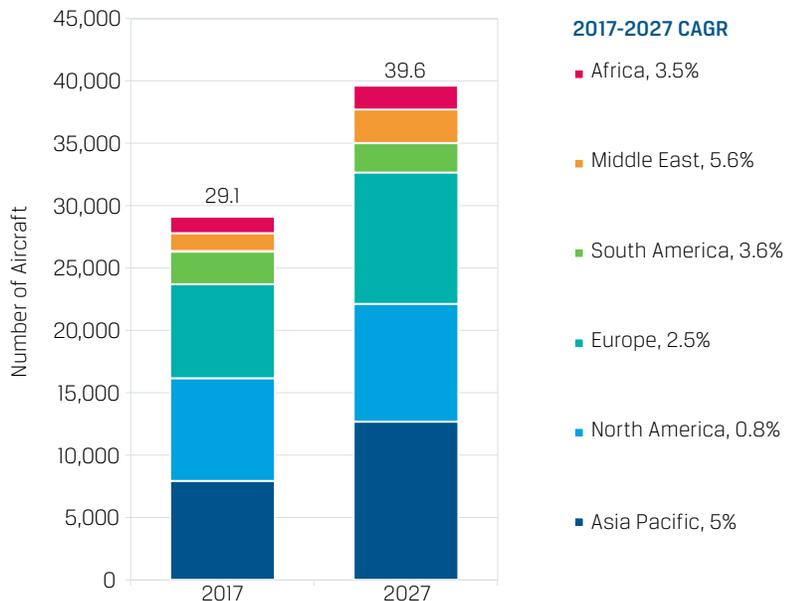
EXHIBIT 5. BOEING INDUSTRY AIRCRAFT DELIVERY FINANCE OUTLOOK



Source: Boeing Capital Corporation 2018 Outlook.

Between 2016 and 2026, each region will have a different need for new aircraft. Led by the Middle East, with an average CAGR over the decade of 5%, the overall world new aircraft needs will average an increase of 3.2% over the decade studied.

EXHIBIT 6. TOTAL AIRCRAFT NEEDED BY REGION



Source: ICF Analysis, 2016

Note: Data labels in thousands



IV. Operating Leasing Benefits to Airlines

Airlines find multiple advantages in leasing as one of their multiple aircraft financing tools. Operating leases are generally offered for durations between 6-14 years, with shorter terms for older aircraft. At the end of the lease, the airline can renew its lease or return the aircraft. Most lease contracts include deposits, maintenance reserves, and return conditions.

The financial benefits of operating leases include:

- No capital outlay is required
- In particular, leases are often preferred for start-up carriers because they lower the capital requirements for entering the market, which are especially important in many emerging markets
- No residual value risk
- No ownership risk
- Off balance sheet as lease rental payments are recorded as expenses (although pending changes under US GAAP may remove this benefit)
- Raise liquidity with Sale Leaseback on new aircraft or unencumbered used aircraft
- Cash preservation
- Diversification of funding
- Capital is invested to finance growth and business
- Avoid pre-delivery payments for new aircraft orders

The operational benefits include:

- Fleet planning flexibility: Airlines can meet short-term demand or variations.
- Ability to manage changing capacity and seasonality and have a more dynamic capacity management where airlines manage their lease terms and returns.
- Leasing allows airlines to meet interim capacity or unanticipated demand.
- Leasing also allows access to key slot deliveries from lessors' order book and flexibility in deliveries. Lessors often secure early deliveries for new types of aircraft as they have more leverage than small or medium airlines to adjust slots positions and obtain better purchase pricing.
- Access to new technology aircraft with more fuel-efficient engines

V. Operating Leasing Benefits to Investors

While operating leases have grown in popularity with airlines, investors have equally found the business to be attractive, supporting the lessors with significant volumes of equity and debt.

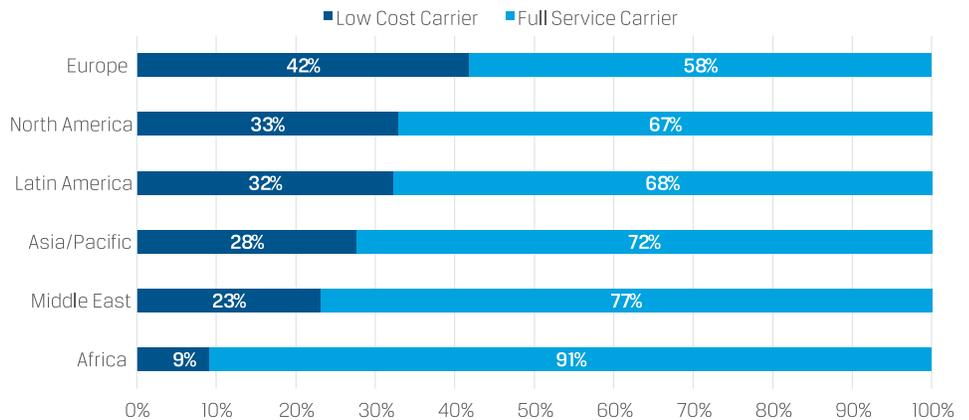
The aircraft leasing industry represents a higher-yield investment opportunity, attracting investment in the order of \$50 billion per year of investments. It is a global business with attractive growth dynamics, driven particularly by the traffic growth in the Asia Pacific markets and emerging economies.

Predictable cash flows of aircraft subject to lease throughout industry cycles have supported stable risk-adjusted returns for the industry. Long-term debt and equity investors are attracted by the stable risk-adjusted returns presented by larger, well-managed lessors, and the retention of asset value over time from their fleets, which are typically dominated by young narrowbody aircraft in high demand from a broad and diversified global airline operator base. Top lessors frequently have aircraft portfolios with long, evenly spread lease maturities, assured growth from strong, near-term order books of new technology aircraft, in addition to dynamic trading strategies and active asset management that maximize economic returns.

VI. The Growth of Low-Cost Carriers ("LCCs") – A Large Consumer of Operating Leases

Depending on the regions, LCC penetration varies but has reached about a third or more of the airlines in North America, Latin America and Europe.

EXHIBIT 7. LCC SEAT SHARE BY WORLD REGION, 2017

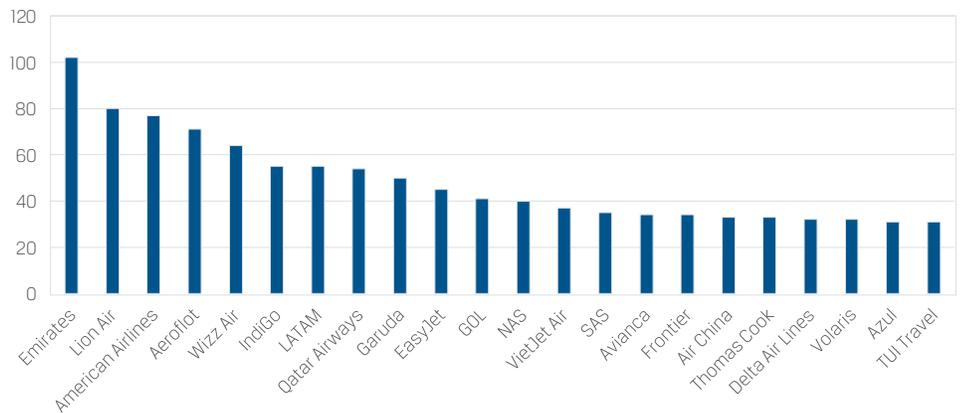


Note: Includes in-service passenger narrowbody, widebody, and regional jets. Excludes aircraft with unknown operator region.

Source: Paxls/OAG, ICF Analysis, 2017

Low Cost Carriers are often new startup airlines with little capital available and/or no credit history to benefit from lending opportunities or capital markets. With the reduced availability of Export Credit financing, many LCCs have turned to Sale Lease-backs to finance new deliveries of aircraft. While still placing volume orders to benefit from scale and reduced pricing, Sale Lease-backs have allowed some airlines to raise funding and make trading gains as they sell the aircraft upon delivery to lessors. In trying to avoid pre-delivery payments that may be difficult to finance, airlines sell their positions earlier in the delivery process. Without the demand of the Sale Lease-back market, many LCCs would not have been able to cope with fast growth and benefit from new and efficient modern aircraft. New LCCs such as Lion Air, VietJet, Wizz Air, Indigo, Volaris, and Air Asia are among the top airlines leasing aircraft.

EXHIBIT 8. CURRENT AND HISTORIC FLEET ON SALE-LEASEBACK [30 OR MORE], BY AIRLINE



Source: Airfinance Journal, December 2017

Note: Count includes all historic transactions for aircraft, which may be currently retired

VII. Regional differences: Latin America has the largest proportion of leased aircraft

Latin American airlines have the largest proportion of leased aircraft, with 59% of their total fleet on operating lease. Europe also has a significant level of penetration, driven by a large number of LCCs. As North American airlines have a wider access to Capital Markets, the proportion of leasing is the lowest in the world.

EXHIBIT 9. CAPA FLEETS, NOVEMBER 2018

Region	Owned Fleet	Leased Fleet
Latin America	41%	59%
Europe	48%	52%
Middle East	58%	42%
Asia/Pacific	58%	42%
Africa	70%	30%
North America	70%	30%

Source: ICF analysis, CAPA Fleets, November 2017

Note: Fleet includes active and inactive commercial jet aircraft

VIII. Future Growth of Aircraft Operating Leasing Industry

While all sources of funding will remain available for airlines, including capital markets and commercial bank loans, operating lessors could become the largest source of aircraft financing within a few years. The lessors themselves fund their acquisitions through capital markets (for about 38%), cash (about 25%) and commercial debt (about 30%). The large availability of capital, coming from private equity firms, institutional investors or Japanese investors, and the parallel emergence of new lessors, particularly from China, play in favor of the airlines which receive competitive offers and low lease rentals, encouraging them to initiate more sale lease-backs.

With demand for travel still growing at a strong pace, relatively low fuel prices, low inflation, and manufacturers' healthy backlog, the role of operating leases in the airlines' financing strategy will only accelerate. Over the next five years, ICF expects the value of jet aircraft deliveries to average more than \$135 billion per annum, split approximately evenly between narrowbody and widebody jets, with regional jets taking a small share.

ICF expects the emerging economies of China, India, and Africa to drive the greatest passenger growth with CAGR of approximately 7-8% in each region. In 2036, ICF believes that the Asia Pacific region will account for more than 43% of total passenger traffic, largely fueled by the expansion of LCCs, economic growth, and an emerging middle class. Strong forecast traffic growth and the corresponding need for lift in the Asia Pacific region is expected to sustain operating lease growth in this area.

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Mylène Scholnick offers more than 25 years of aviation experience in commercial and business aviation with expertise in management, international business development, aircraft financing, strategy, marketing, and sales. Mylène has worked at Paribas, Metrojet, NetJets, and SkyWorks Capital and has been involved in complex projects, advisory mandates, and aircraft transactions. Mylène's network spans across the globe and includes lessors, investors, financiers, OEMs, airlines, operators, airports, insurance, law, banks, private equity firms, and hedge funds. Mylène's expertise includes aircraft financing debt syndication and sale leasebacks, aircraft remarketing, and strategic advisory. She has been involved for the past 11 years in advisory services to airlines, operators, investors, and OEMs in strategic marketing and sales, market analysis, new market entry, growth strategy, aircraft sourcing, international business development, and feasibility studies. Mylene has a Masters of Public Administration from the Institut D'Etudes Politiques de Paris/ Sciences-Po Paris.



Angus Mackay specializes in aviation sector asset appraisal and aircraft asset management, including market analysis and transaction support, aircraft remarketing and sourcing. Angus has extensive operational line management and project management experience, and a strong background in logistics operations, aircraft fleet planning, and aircraft performance analysis. He is also an FAA-licensed commercial pilot and flew with a regional airline in the Northwest United States and a major Australasian airline. Angus is a member of the International Society of Transport Aircraft Trading (ISTAT) and is an ISTAT Senior Appraiser. He has an MBA from Victoria University.



Anala Ravinarayan is experienced in performing valuation analyses and due diligence investigations. Prior to joining ICF, Anala worked at CB Capital Partners and her role included assisting with mergers and acquisitions, among other duties. Anala also previously worked at Airbus where she assessed and controlled the credit risk on a portfolio of 40+ customers, thus ensuring the security of 300+ aircraft deliveries. She also upgraded Airbus' internal credit rating model, thereby increasing the robustness of its risk prediction ability. Anala's experience also stems from her work at Moody's Investor Services, Sovereign Risk Group. Anala holds a Master of International Affairs, International Finance and Economic Policy from Columbia University, as well as an MSc, Financial Markets and Investments from Skema Business School in France.

