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Global air transport industry profits are predicted to reach $33.8 billion in 2018, according to the International Air Transport Association (IATA), versus a $38.4 billion forecast in December 2017.

The 12% downgrade is mainly due to higher fuel prices and labour costs. This year's net profit will translate into 4.1% net margin, the lower net margin recorded by the airline industry since 2015.

Overall revenues are predicted to total $834 billion, versus $754 billion in 2017. But while revenues will be 10.7% up from last year, expenses will grow at 11.5%.

For airlines, controlling the costs is the issue, going forward. IATA says inflation pressures are starting to emerge at this late stage of the economic cycle and airlines are facing 'significant pressures' from rising fuel and labour costs in particular.

The organisation expects the full-year average cost of Brent Crude to be $70 a barrel. This will be up from last year's $55 a barrel (IATA predicted $60 a barrel in 2018).

Jet fuel prices are expected to rise to $84 a barrel. This will represent a 26% increase for airlines and as a result fuel costs will account for 24.2% of total operating costs (up from a revised 21.4% in 2017). Over the past 10 years, fuel costs have represented 27.7% of total operating costs on average.

Overall unit costs are forecast to rise 5.2% this year, after a 1.2% increase in 2017. This four percentage point increase will be significant for airlines.

The industry keeps ordering aircraft

At this year's Farnborough air show, all five major manufacturers announced orders and commitments, with some more strategic than others.

Indian carrier Vistara, a joint venture of Tata Sons and Singapore Airlines, continued to commit to the Airbus narrowbody family, but because it is about to start international operations, the carrier selected the Boeing 787-9 model.

Privately owned Vietnamese low-cost carrier Vietjet selected the Max 10 model, through a memorandum of understanding (MoU) for 80 units (along with 20 Max 8s) complementing an existing commitment for 100 737 Max 8s. Vietjet operates 28 A320s, 30 A321s (and has a backlog for another six), as well as one A321neo (with another 72 on backlog). Vietjet also ordered an additional 50 A321neo aircraft at the air show. Nguyen Thi Phuong Thao, Vietjet's president and chief executive officer, says this dual-aircraft original equipment manufacturer (OEM) strategy provides a degree of protection against delivery delays.

During the show, Airbus won new business for 431 aircraft (93 firm orders and 338 MoUs). Those comprised 60 A220-300s, 304 A320-family aircraft, 42 A330neos and 25 A350s.

The European manufacturer notably announced 42 commitments for the A330neo, including both the -800 and -900 models. Boeing announced 673 orders and commitments, reflecting a continued resurgence in demand for freighters and strong order activity for the 737 Max and 787 passenger aircraft.

The US manufacturer secured 48 orders and commitments for the 777F, notably five for the 747-8F model. Embraer had a good show with sales, options and Letter of Intent (LoI) commitments for a total of 300 aircraft.

In the North American market, the Brazilian manufacturer continued to sell the E175 model. United Airlines signed a firm order for 25 E175 jets in a 70-seat configuration. Including this new contract, Embraer has sold more than 420 E175s to airlines in North America over the past five years. Republic Airlines signed an LoI for a firm order of 100 E175s, with the right to convert to E175-E2 aircraft, and purchase rights for an additional 100 E175s. E2 commitments are coming in but not at the pace most people expected. At the show, Embraer announced three commitments for the E195-E2 model and one E190-E2 commitment.

The market was quieter for turboprop aircraft, with ATR announcing three firm orders and 13 commitments. Bombardier announced a new customer for the CRJ900 model: Uganda Airlines.

There was an unusual amount of undisclosed announcements at this year's show, especially from Airbus. Of the 1,424 total undisclosed announcements represented 417 aircraft, or 29.3%.

No financing issues

Financiers and investors continue to be attracted to the aircraft market.

Boeing's Current Aircraft Finance Market Outlook (CAFMO) expects commercial bank debt to continue its resurgence in 2018 as new global banking regulations drift further into the future.

The banking sector remains heavily involved in financing with China expected to finance almost 28% of this year's jet aircraft deliveries. The Japanese banks are expected to take almost half of China's output with 17%, followed by Germany with 16%, France with 9% and Australia with 8%, the USA with 7% and the UK with 5%.

Bank debt emerging from Japanese banks is expected to show the largest increase. "The growth in Japanese banks' role in aircraft finance is attributable to two factors: first Japanese regional banks are joining Japanese global banks in financing aircraft and second, year-over-year higher deliveries to Japanese airlines," said Tim Myers, president of Boeing Capital (BCC) in an interview with *Airfinance Journal*.

According to the outlook, China's involvement is expected to reduce in terms of percentage points this year. "In 2017, Chinese airlines reduced their appetite for financing their deliveries in reminbi and increased US dollar-denominated financing as a result of currency movements. This made Chinese banks' pricing more in line with other global banks and allowed more non-Chinese banks to participate in financing deliveries into China. We are still seeing a trend of 'China funding China' due to the interest in the market and growth of passenger travel in the region," said Myers.

Boeing forecasts continued strong demand for new commercial aircraft in 2018, resulting in about $139 billion in deliveries by major manufacturers. The annual aircraft financing requirements is expected to grow to $189 billion by 2022.

In 2018, a quarter of new aircraft deliveries will be funded with cash from airlines. This compares with 27% in 2017 and 24% of deliveries cash-funded in 2016.

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Good times, bad times

Aviation might still be enjoying its supercycle, but that does not mean there is nothing bad waiting around the corner, writes Bert van Leeuwen, with contributions from Albert Muntane Casanova and Steven Guo, DVB Bank SE.

In last year's industry review, we reluctantly revived the term "supercycle" to describe the state of the industry. Now, more than halfway through 2018, we can conclude that indeed the good times are still continuing in the commercial aviation business in a way never seen before.

Traffic volumes in revenue passenger kilometres (RPK) have been growing more than 5% a year since 2010 and over the first half of 2018 global traffic increased by a very robust 7%. In addition, airlines are still enjoying higher load factors. Over the first half of 2018, the load factor improved to 81.3%, a level not deemed possible only a few years ago.

After some fairly high-profile airline defaults during the past few years, and recognising that many airlines are still struggling, the bottom-line results of the world's air transport providers looks healthy, with positive net operating results every year since 2010 and even decent returns on invested capital for the past four years.

The International Air Transport Association (IATA) did adjust its forecast for the industry's 2018 profit from $38.4 billion (December 2017) to $33.8 billion (June 2018) because of expected increases in fuel, labour and interest costs, but even at the new lower level this still is an excellent result by industry standards.

Order volumes for new aircraft reached a peak in 2013-14 but ordering continues at high levels. Today, the industry backlog for western-built commercial jets is about 50% of the in-service fleet of about 28,000 aircraft. This backlog is equivalent to almost nine times the 2017 level of production. In reality, the backlog can be fulfilled quicker because 2017 production levels were restricted by (engine) supply problems for some of the more popular aircraft types.

Clearly, not all airlines are profitable and not all manufacturers have reasons to celebrate. Sales volumes for the Airbus A320 family and the Boeing 737 have reached unprecedented levels, but twin-aisle sales are definitely not as strong while in the regional jet market, a relatively large group of manufacturers, is competing for a relatively limited number of new aircraft orders.

The regional jet landscape, however, is changing dramatically. Airbus took over the Bombardier CSeries programme and renamed the aircraft Airbus A220. In response, Boeing revealed plans to take over the commercial jet unit of Embraer. Should this deal materialise, the market will see Airbus and Boeing competing head-to-head over virtually the full range of commercial jets with more than 100 seats. It seems, however, the North American-Brazilian link up (that clearly was a response to Airbus's move to take over the CSeries) is mainly driven by Boeing's desire to access Embraer's engineering resources and benefit from lower production costs in Brazil – more so than the desire the become a regional jet player.

On the money side of things, the industry continues to attract new investors and financiers which are looking for yields unavailable in their traditional markets. As a consequence, the aircraft finance market is extremely competitive, which translates in low margins and, for lessors, very low lease-rate factors.

In addition, it seems terms for airlines and aircraft lessors are becoming increasingly borrower-friendly. While in the past competition outside of the mainstream new aircraft market was limited, today market niches, such as aero-engines, freighters, predelivery payment financing, older equipment and end-of-life assets, enjoy the interest of a good number of financiers and investors. Fortunately, trading volumes are high and, because of the combination of strong demand, restricted supply and low fuel cost, airlines are generally willing to extend leases, even for slightly older-technology aircraft.

So, are there no clouds in the sky at all for the industry? Certainly not. There is still a number of airlines in trouble. The future of Alitalia remains uncertain and the recent pressure on selected emerging market currencies, in particular Turkey, but also Argentina and South Africa, could cause problems for the local carriers. The spreading protectionism, trade tensions and the political unpredictability of certain countries have not made any major impact on the airline business yet, but these factors will be cause for concern for some time.

On the equipment side, while the manufacturers cannot produce enough A320s and 737s, it seems the larger widebody segment is struggling and the current-generation Airbus A330 and Boeing 777 may come under more pressure once the temporary demand to replace grounded Rolls-Rolls-powered Boeing 787s disappears.

Investors with significant positions in large twin aisles, such as the Airbus A380 or even 777s, probably look at future lease terminations with some concern. While some A380s returned by their previous owners continued as flyers (but at what terms?), others were parked in Tarbes, France, and only seem to serve as part donors (including the high-value engines).

The title of the most recent (July 2018) update of the International Monetary Fund's (IMF) World Economic Outlook clearly has a less optimistic tone compared with the July 2017 edition. While last year the theme was "A firming recovery", this year the report's subtitle is "Less even expansion, rising trade tensions". While the IMF maintains that the pickup of the global economic growth remains about 3.9% both in 2018 and 2019, the organisation also notes that the expansion is becoming less even, that expansion in some major economies has peaked and that risks to the outlook are mounting.

Projected oil price increases have been adjusted downwards for 2019. The average oil price was $42.8 a barrel in 2016, $52.81 in 2017 and the IMF now projects an average of $70.23 (adjusted from $59.9 in the January 2018 World Economic Outlook) for 2018 and $68.99 (adjusted from $56.4 in the World Economic Outlook) for 2019.

It seems demand for air transport services is still sufficiently strong, even without the stimulus of lower ticket prices. However, despite generally strong yield figures, rising oil prices have already had an impact on the bottom line of a number of airlines. Disruption of global trade and industrial production as well as further – unexpected – rises in oil prices are obviously potential threats for commercial aviation, and under a negative scenario could put the prolongation of the supercycle at risk.

As mentioned in the headline of IMF's July 2018 report, expansion levels differ per region. Advanced economies are projected to grow by 2.4% in 2018, before easing to 2.2% in 2019. Emerging markets and developing countries are at 4.9% and 5.1%, respectively. The US is expected to enjoy a temporary strengthening because of a combination of fiscal stimulus with the existing strength of the private sector. Unemployment is at very low levels. Growth in the US is projected at 2.9% in 2018 and 2.7% in 2019.

Growth numbers in the Euro area were adjusted downward to 2.2% in 2018 and 1.9% in 2019 as a result of activities softening in the first quarter in Germany, France and Italy.

Also Japan has been revised downward 1% in 2018 and 0.9% in 2019 as a result of weak private consumption and investment.

Emerging countries, according to the IMF, experienced the impact of rising oil prices, high US yield levels, a strengthening US dollar, trade tensions and geopolitical conflicts. The updraft on oil exporters from the improving fuel prices was largely offset by the drag this caused on other economies. Emerging and developing Asia is expected to grow at no less than 6.5%, with China, however, seeing a drop from 6.9% in 2017 to 6.6% in 2018 and 6.4% in 2019. Growth in India is expected to rise from 6.7% in 2017 to 7.3% in 2018 and 7.5% in 2019.

In developing Europe, growth of the Turkish economy is expected to slow down significantly from 7.4% in 2017 to only 4.2% in 2018 and 3.9% in 2019.

Growth in Latin America remains modest at 1.6% in 2018, increasing to 2.6% in 2019. While for commodity exporters the higher prices provide some support, tighter financial conditions and the need for policy adjustments in Argentina as well as strikes and political tension in Brazil explain the more subdued outlook. Renegotiation of the North American Free Trade Agreement and the collapse of the economy in Venezuela are other negative factors.

Intensifying geopolitical conflicts and the need for fiscal consolidation in the Middle East are compensated by the improved outlook for oil. Consequently, growth is projected to strengthen from 2.2% in 2017 to 3.5% in 2018 and further to 3.9% in 2019, numbers that were adjusted upwards from the earlier April economic outlook.

In sub-Saharan Africa, growth figures have been adjusted upwards thanks to rising commodity prices, from 2.8% in 2017 to 3.4% in 2018 and 3.8% in 2019. Finally, the IMF expects a stabilisation of growth at about 2.3% for the Commonwealth of Independent States, implying an upward revision to 2.3% in 2018 and 2019. Russia and Kazakhstan both should benefit from stronger oil prices.

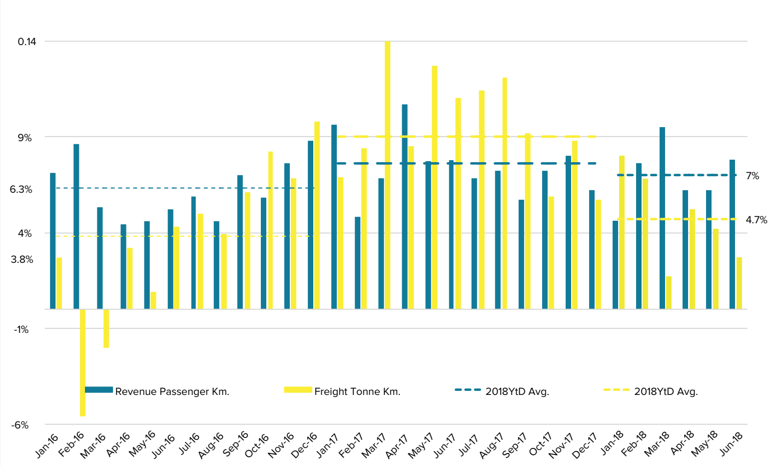
Overall, the IMF notes for the global economy that the downside risks have become more salient, most notably the possibilities of escalating and sustained trade actions and tighter global financial conditions. Financial conditions face the possibility of abrupt shifts because of the market's reassessment of fundamentals and risks.

The global aviation industry has proven remarkably resilient to many geopolitical and other non-economic shocks in recent years. According to the United Nations World Tourism Organisation (UNWTO) World Tourism Barometer, global travel and tourism remained relatively strong over the first four months of 2018 as international tourist arrivals increased by 6.2%. Over the full-year 2016, international tourist arrivals increased 3.9%, while full-year 2017 saw a 6.8% increase.

There were big differences among the various regions. Africa and Europe grew by 9% and 8.4%, respectively in 2017 but both saw a drop to 5.6% and 6.8%, respectively over the first

Recent monthly traffic developments

Source: IATA Air Passenger and Freight Analysis



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months of 2018. The Americas had 3.3% more tourist arrivals last year, with 3% so far this year. Asia-Pacific seems to be speeding up, from 5.6% in 2017 to 7.8% in early 2018, while the Middle East remains stable, going from 4.6% last year to 4.5% now.

In terms of total tourism spending, China takes the top position with $258 billion, followed by the US with $135 billion, Germany with $84 billion, the UK with $63 billion and France with $41 billion.

The top net earner from global tourism is the US with $211 billion, followed by Spain with $68 billion, France with $61 billion, Thailand with $57 billion and Italy with $44 billion.

It is a far cry from the 1960s when international tourist arrivals reached only 69 million. By the year 2000, this number had increased to 669 million: that had almost doubled by 2016 to 1.23 billion. For 2018, another increase to 1.8 billion is expected.

Last year, air transport had a share of 55% of all tourist arrivals, followed by 39% for road transport. Water (4%) and rail (2%) are relatively insignificant. Confidence in international tourism remains high, according to UNWTO. Its expert panel's outlook for the May-August period this year is one of the most optimistic in a decade, with sentiments particularly upbeat for Africa, the Middle East and Europe.

Over the first half of 2018, global RPKs increased by a solid 7%. According to Iata, this growth level still illustrates the strength of underlying demand, despite a slight slow down versus the 7.9% achieved during the first half of 2017. This year the industry has not been able to lower airfares to stimulate demand because of rising input costs, most notably fuel prices.

The average return fare (before surcharges and taxes) in constant (2018) US dollars dropped to $394 in 2016 from $380 in 2017 but is anticipated to remain at this level in 2018. A stabilisation of airfares would be relatively unusual, taking into account that between 1998 and 2018 fares dropped by 59%. The main factor ending this period of falling ticket prices is obviously the cost of fuel because it has mainly been the lower fuel price that enabled airlines to lower ticket prices. Fuel cost for the global airlines dropped dramatically – 22.1% – especially between 2014 and 2015. Between 2015 and 2016 another significant drop of 24.1% could be noted but between 2016 and 2017 the fuel bill increased by 10.3% and for the year 2018 another increase by no less than 26.1% is projected. The average annual fuel price in dollars a barrel dropped by 41.9% in 2015 and 21.9% in 2016 but increased again in 2017 by 28% and for 2018 another 25.9% increase is anticipated. Between 2017 and 2018, fuel cost as a percentage of total operating cost is set to increase to 24.2% from 21.4%.

The projected total spend on air transport in 2018 is anticipated to be about $834 billion, 10.7% higher compared with the $754 billion from 2016. In real volume terms, both the RPKs and the number of passenger departures are projected to increase. The RPK volume will rise from 7.75 billion in 2017 to an estimated 8.29 billion this year, a 7% increase. The number of passenger departures will increase by about 6.5% to 4.36 million.

The airline industry is offering its customers an increasing range of direct connections. Over the past 20 years, connectivity increased by 108%, and today the world's airlines offer connections between well over 21,000 unique city-pairs.

From a financial perspective, the airlines entered a new era in 2015. Before then, global airline operating profit margins would be about 3% to 4% at best and generally any profitable year would quickly be followed by one or more years with break even or negative results. In 2015, the profit margin suddenly skyrocketed to 8.6% and this level could be maintained in 2017. Preliminary figures for 2017 indicate a slight reduction to 7.5%. For 2018, the expectations are even more modest with a forecast for 6.8%. Clearly, as a result of increasing (fuel) costs the industry has passed the peak of the profitability cycle, but compared with previous cycles, there seems to be no short-term risk of the global airlines diving into the red.

It should be noted that the main cause of this swing in profitability has been the structural changes in the North American airline landscape. The main contributors to the global airline profit numbers are without doubt the North American carriers. It is interesting to compare the absolute post-tax profit per region and the profit per passenger. By both criteria, North America stands out.

Comparing net profit figures, the system-wide global commercial airline profit reached $38 billion in 2017. Just over 48% of this, or $18.4 billion, was generated by North American airlines. Almost 27% came from the Asia-Pacific, overtaking their European competitors to take second position. European airlines contributed 21%, the Middle East just under 3%, Latin America just over 1% and African airlines lost $100 million, so not contributing to industry profitability.

For the year 2018, the relative positions are not expected to change a lot. North America is projected to

Crude Oil & Jet Fuel - Price Development

As of Aug. 21st : WTI = $66,50 / BBL; Brent $71,11 / BBL ; Jet Fuel $2,077 / Gallon

account for 44% of the anticipated $33.8 billion net profit, Europe and Asia-Pacific each about 24% to 25%, respectively. The Middle East carriers are expected to improve their results to $1.3 billion, or about 4% of the industry total. Latin America is projected to contribute just below 3%, while Africa will again be negative.

Comparing the profitability per passenger eliminates the impact of the relative size of each region. Asia-Pacific as an example has a share of 33.7% of global traffic, versus only 2.2% for Africa. Profitability per passenger as such reflects the performance of each region more fairly. For 2018, each North American airline passenger is projected to generate $15.67 net profit. In Europe, it is $7.58, with $5.89 in the Middle East and $5.1 in the Asia-Pacific. In Latin America, profit per passenger is a bit lower at $1.78 and African carriers, which subsidise each passenger, generate a negative $1.55 per passenger.

Apart from the benefit of lower fuel cost, the North American result can be explained by the increased (domestic) market power of the major airlines after a wave of consolidation. This has enabled improved pricing power, as well as higher load factors and more income from ancillary services.

Traditionally, when airline profitability goes up, the new order volume for commercial aircraft increases also. In the past years, this relationship has been broken. While the industry profit doubled between 2014 and 2015 and subsequently stayed at a near record high level in 2016-18, the number of new aircraft gross (net) orders dropped from about 3,500 (3,100) in 2014 to about 2,400 (2,100) in 2015 and 2,200 (1,750) in 2016 to just under 2,600 (2,300) in 2017 (new orders for western-built jets).

Over the first seven months of 2018, the trend in new ordering seems to continue up again with about 1,100 (1,000) orders versus just about 800 (700) over the same period in 2017. It has to be taken into account that counting orders is not always straightforward, because of different contract types. Apart from firm orders, manufacturers also announce memorandums of understanding (MoUs), letters of intent (LoIs), options and option LoIs. As an example, during the 2018 Farnborough air show a total of 1,464 order commitments and options were announced by the manufacturers, of which only 400 (27%) were firm orders.

Both the 737 and the A320 continue to be the most popular commercial jet types by far. According to the Flightglobal Ascend database, Boeing sold about 450 737 Max aircraft during the first seven months (75 cancellations) of the year, including orders announced at Farnborough. Airbus sold more than 200 A320neos during the same period. Despite reliability problems and production delays around the new single-aisle engines, it is clear that the 737NG and A320 are coming to an end. Boeing received orders for only 13 more NGs, while Airbus's orders totalled 22 A320s.

After the transfer of the CSeries family of large regional jets from Canada's Bombardier to Airbus, a firm order for 30 aircraft was received (excluding any LoIs or options, etc). Bombardier sold another 30 CRJ900 regional jets.

Despite a flurry of different types of commitments at Farnborough, Embraer has only a limited firm order volume. So far this year, the old Embraer E1 version is still outselling the new E2. Japanese manufacturer Mitsubishi's MRJ has not had much sales success this year.

Widebody aircraft sales volumes are still relatively low, but improving. Boeing sold about 105 of its 787 types, while Airbus placed about 58 A350s. While Boeing also sold about 33 777s, the vast majority of these sales were for the freighter version of the aircraft. In addition, Boeing sold 14 747-8 freighters and 20 767-300ER freighters. Airbus sold 14 A330s, of which the majority was for the re-engined A330-900neo version. Emirates Airline also placed orders for another 20 A380s, giving the type a shot in the arm.

Kerosene-type jet fuel prices were up by 38% in August 2018, compared with a year ago. Despite the fuel price increases during the past months, and oil at about $70 a barrel no longer cheap, it seems that airlines are still comfortable with extending leases on existing old- and current-technology aircraft, rather than making a massive switch to new-technology equipment. By doing so, airlines can benefit from the highly competitive situation among aircraft lessors and operate low capital cost (or low lease rate) aircraft without paying a huge penalty in the form of a massively higher fuel bill. As generally airlines expect a gradual increase in fuel cost, the market has not seen massive cancellations of the new-generation aircraft; however, reportedly aircraft lessors are not able to generate significant lease-rate premiums for the new-technology aircraft compared with the older types, where short-term availability is at a premium.

After having fluctuated between about $2.8 and $3 in 2013-14, jet fuel (US Gulf Coast, FOB) reached a low in January 2016 at just over $0.8 a gallon. Subsequently, the price showed a generally upward trend to a peak of $2.22 in May this year and, in August, kerosene fluctuated between $2 and $2.1 per gallon.

Apart from the still modest price of jet fuel, it seems the new order volume is held back by the record backlog already on order and the resulting significant lead times for the delivery of the more popular jet types. Overall, the backlog for western-built commercial jets (all civil operations) is equal to about eight-and-a-half times the number of jet deliveries made in 2016. As production is set to increase in the coming years (bar any supplier constraints, such as engines and interior parts), burning off the backlog may not take as long.

The launch of a new aircraft type can have a stimulating effect on order volumes. Compared with the boom years in the first half of the decade, major new product launches were almost absent during 2015-17, not counting some significant product variants (such as the Airbus A321neo LR). Most developments that were announced focused on range increases and high-density interiors, by applying slimline seats, more compact galleys and toilets and reconfigured emergency exits.

However, the importance for aircraft orders of the launch of a new aircraft type was vividly illustrated during the 2017 Paris air show, when Boeing launched a new stretched version of the 737 Max family, dubbed the Max-10. Shortly after the launch of this new version, Boeing booked more than 360 commitments, 260 orders plus over 100 LoIs and options. It must be noted that the majority of these orders were changes in variants.

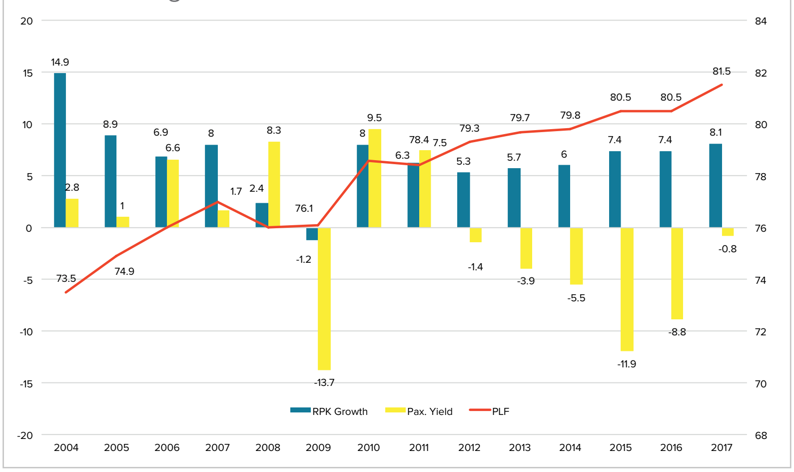
The year has not seen any major new aircraft launches, apart from a rebranding of the former Bombardier CSeries CS100 and CS300 as the A220-100 and A220-300, respectively. It can be argued that even this change sparked additional interest in the type because immediately after the announcement some major commitments followed, after some years of relative calm in the orderbook.

Another fairly low-profile development is the intended redesign of the 787-8. While this launch version of the 787 enjoyed good sales success in the early phase of the programme, later on the spotlight moved to the bigger 787-9 and -10 and the orderbook for the 787-8 slowly dried up.

In April, American Airlines placed an order for 787s, surprisingly including the -8 version. It turned out this was for a structurally different -8, compared with the earlier aircraft. Reportedly, the aft fuselage commonality between the 787-8 and 787-9 is relatively low, only 30%, while commonality between the -9 and -10 is almost 95%. Apparently, this resulted in relatively high production cost for the -8, making this version less attractive to sell for Boeing, compared with the more lucrative -9 or -10.

With a more common design, the manufacturing cost of the -8 will go down, which will improve the profit margin on future sales. Interestingly, while this will also strengthen Boeing's competitive position versus the A330neo, the improved 787-8 design plus the 2017-launched 737 Max-10 could, in theory, limit the open space in the market for a future Boeing New Midrange Aircraft (NMA). This middle-of-the-market NMA – and Airbus's response to it – probably is the most exciting potential new aircraft design of the moment, and the subject of many industry debates. Boeing released a rendering of the NMA this year, and reportedly is thinking about

IATA Passenger Market Data



two versions, probably called 797-6X and 797-7X. Any launch decision will only be made in 2019, interestingly while maintaining the entry-into-service date in 2025.

Like in 2017, during the first months of 2018 any airline or leasing company looking to finance its fleet purchases had ample choice from a range of funding sources. Both debt funding and equity is abundantly available at historically low cost and offered by a broad range of lenders and investors worldwide. The only traditional sources of funding that have not been available for about three years has been export finance for Airbus and Boeing products.

Both the Export-Import Bank of the United States (Eximbank) and the European export credit agencies (ECA) had their problems. While Eximbank's charter was reauthorised for five years at the end of 2015, the US Senate did not nominate three new board members, essentially taking away the bank's ability to approve big-ticket $10 million-plus transactions.

Last year, Scott Garrett, a former congressman, was nominated to lead the bank, but the Senate Banking Committee rejected his nomination.

In July, President Trump nominated Kimberly Reed to serve as president of Eximbank after her nomination as first vice-president was withdrawn earlier in the year. In August, Reed's nomination got support from the Senate Banking Committee. Other nominees for the board of directors are Spencer Bacchus, Judith Prior and Claudia Slacik. Senator Pat Tooney, however, said he would continue to block a quorum on the bank's board, so the bank will still not be able to approve big-ticket transactions.

Interestingly, ECAs from Italy and the UK guaranteed credit lines for local suppliers to help financing for Boeing products. As an example, Lot Polish Airlines has taken two 787s on finance leases with guarantees from UK Export Finance (UKEF). These aircraft are the first 787s to be guaranteed by UKEF under a programme in which the UK's export credit agency offers support for (Rolls-Royce-powered) aircraft with a significant UK content.

As an alternative to export credit, Boeing, together with Marsh & McLennan and Aircraft Finance Consortium, developed the Aircraft Finance Insurance Product (AFIC). This is a syndicate of insurance companies (Allianz, Axis Capital, Endurance/Sompo International and Fidelis) providing a default or non-payment insurance for banks and capital market investors funding new aircraft purchases from Boeing. The premiums and advanced rates are inspired by the terms set forth in the 2011 Aircraft Sector Understanding. The structure has already been used to finance more than $1 billion-worth of commercial jets. While AFIC reportedly has no immediate plans to support Airbus aircraft, there seems to be no specific reasons why the European manufacturer could pursue a similar solution.

In Europe, the problems were of an entirely different nature. In April 2016, UKEF, Coface (France ECA) and Euler Hermes (German ECA) halted all guarantees and export support for Airbus aircraft. Alleged “inaccuracies” in applications for export credit financing relating to information provided in respect to consultants and other third parties were the reason for this suspension of support. In early 2018, Airbus reached an agreement with the ECAs on a process under which it would be able to apply for UK ECA support again this year and, in April, the company was reported as having received European export credit support for two A330s going to Rwandair.

Air transport market – first-half 2018

After a couple of years of good times, could it be that the tide has already turned? After all, one of the most used terms in quarterly and half-year reports from airlines during the first half of 2018 was “fuel price increase”. Despite some negative impact on the results of many airlines, passenger growth still remains very strong, and this has enabled airlines to adjust their pricing upwards. Maybe surprisingly, the continuous political uncertainties worldwide are not having much of an impact on demand – although it would be interesting to know how much higher passenger demand would have been had those uncertainties not been there.

Less than a year ago, as an example, Japanese hotels were warning their guests there could be North Korean rockets. After three years of RPK growth between 7.4% and 8.1%, the forecast for 2018 is slightly below at 7%, which is not enough to signal a real change in the trend yet.

In 2017, airlines delivered the highest-ever profits as an industry and, according to Iata, they generated a record net profit of $38 billion (5% net margin), which would translate approximately into a net profit of $9.3 per passenger.

These were a result of a very strong demand, where RPK grew 8.1% on a 6.7% available seat miles (ASK) growth and, as a result, airlines experienced their highest-ever load factors, reaching an average of 81.5% on a global basis. Passenger yields were down 0.8% versus 2016, but this yield development shows a remarkable improvement compared with previous years. As airlines were experiencing an increasing fuel cost, they seem mostly to have been able to pass on those increases to passengers.

As can be observed from the chart, profitability in 2017 has been consistent with 2016 levels across all regions, with again North America maintaining the lion’s share of net profits, followed by Asia-Pacific and Europe. Forecasts for 2018 based on first-half data show a bit of a reversing trend in the first two regions, but apparently keeping or increasing its levels in Europe. Last year, at this same time, the forecasts for 2017 profits were $31.4 billion, and airlines and Iata updated their forecasts after mid-year to a record $38 billion in order to reflect better-than-expected second-half demand.

Initial information for July 2018 is showing a very strong performance in terms of load factors, but given the pressure on the costs side (fuel and wages) and potentially negative foreign exchange effects for some airlines, it is too early to foresee a reviewed 2018 forecast.

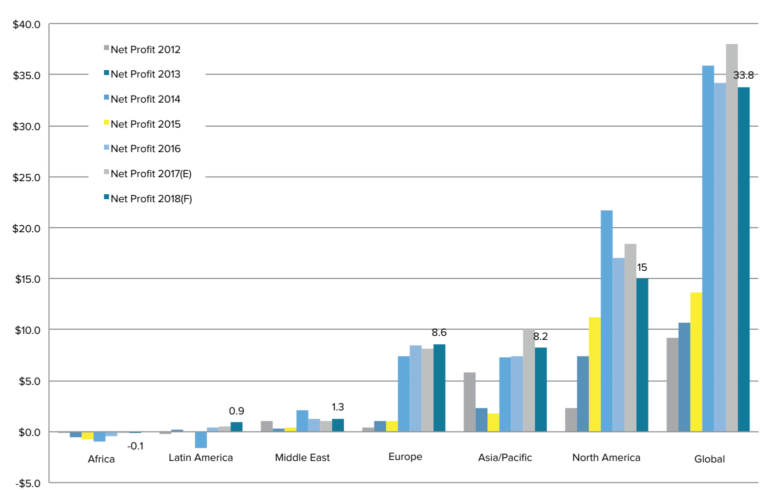
Using data from The *Airline Analyst*, we performed a more granular analysis on airline profitability in 2017. Using a sample of 160 airlines (including both passenger and cargo), we see that the majority of those (79%) were profitable – ie, they had positive net results – and only 21% posted negative results. If we then look at earnings before interest, taxes, depreciation, amortisation and rent cost (Ebitdar) levels, these airlines delivered on average a 19% Ebitdar margin. This compares positively with 14% in 2010, the first year when the industry had positive net results after the global crisis. While not evenly distributed, and with the potential caveat of the fuel price, the 2017 Ebitdar figures seem to suggest that the majority of airlines are proficient and capable to manage their operations profitably.

However, if we look at these same airlines at net profit levels, we clearly see that the biggest portion of last year’s profits come from a reduced number of airlines, and many others are only capable of delivering small results.

Nevertheless, the picture looks a bit brighter if we put these numbers in relation to the respective airline revenue sizes.

As we can see in the chart, airlines are showing a solid improvement in managing their operating margins (Ebitdar) and also have managed a significant reduction in their debt levels, which results in lower adjusted net debt/Ebitdar ratios. This combination of better operational results and financial metrics give us some comfort in the resilience of the airline industry in a potential downturn.

Airline Net Profit (Post Tax, in US$ bln.) by IATA Region



Meanwhile, airlines seem not too worried about a potential downturn and they continue to order and lease aircraft to accommodate the continuous growth of demand. Measured in ASK, Asia-Pacific is leading such growth in both 2017 and 2018, followed closely by Europe and Latin America. The Middle East, however, has slowed its past impressive growth rate. North America shows a stable growth rate at about 4%, very much in line with previous years.

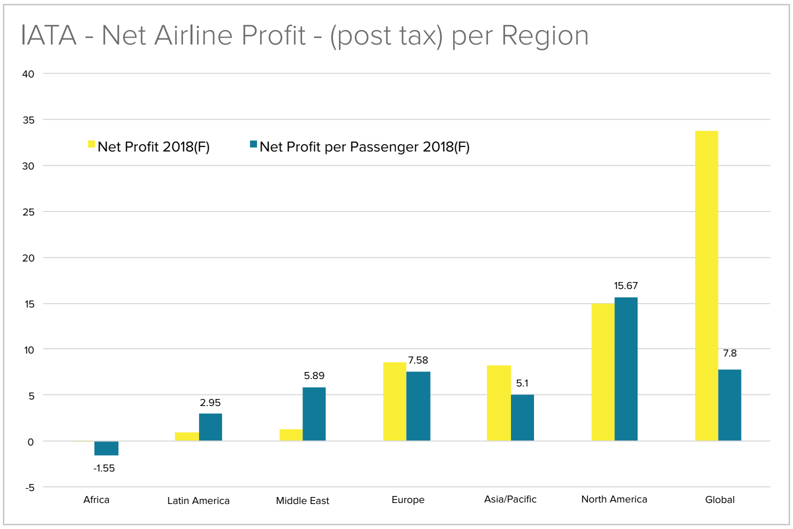
The most relevant fact, though, remains that all regions are forecasting a growth in demand above growth in capacity (RPKs are above ASKs in all regions) for the current year, and some regions are showing a massive capacity growth in the first quarter of 2019.

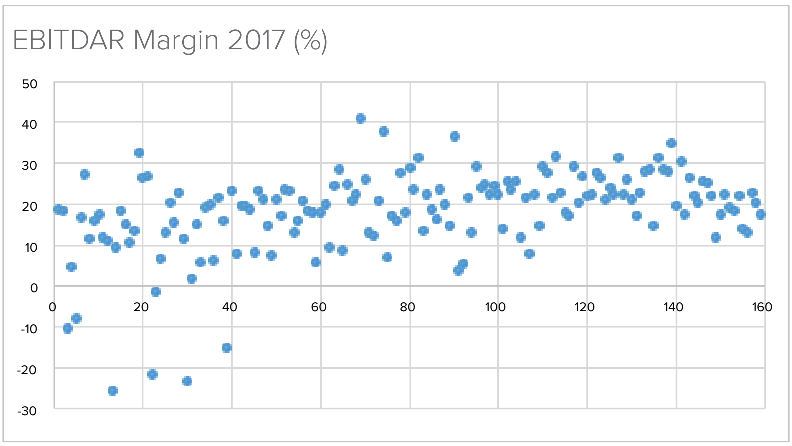
Taking a different angle, and according to schedules and capacity data from Diio/SRS Analyser, if we look beyond the regional focus we find that capacity has been growing at a higher rate in non-hub airports than in traditional hubs.

Perhaps not surprisingly given the saturation of some of the largest hubs and the ever-present growth of the low-cost carrier (LCC) model, capacity at non-hub airports measured in ASK accounts already for 55% of the total production of passenger airlines. With growth rates that are almost twice of those in hub airports, the gap between non-hubs and hubs continues to expand.

If we look at the seat capacity distribution per airline groupings, we can clearly see that on a global level, LCCs account already for almost one-third of the seats available, and taking into account that traditionally this type of operator reaches higher-than-average load factors, it can safely be assumed that LCCs already carry one-third of all passengers. In any case, LCCs continue to grow faster than their traditional competitors.

It is comforting to see that the recovery in the airfreight market continued to be strong throughout 2017 and – albeit at a more moderate pace – also in the first half of 2018. This slowdown in the upward trend mainly reflects the fact that the inventory restocking cycle is adjusting downwards and also that export



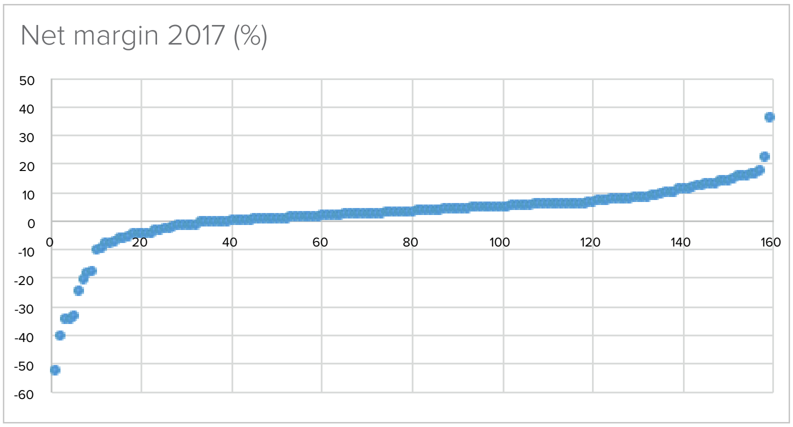


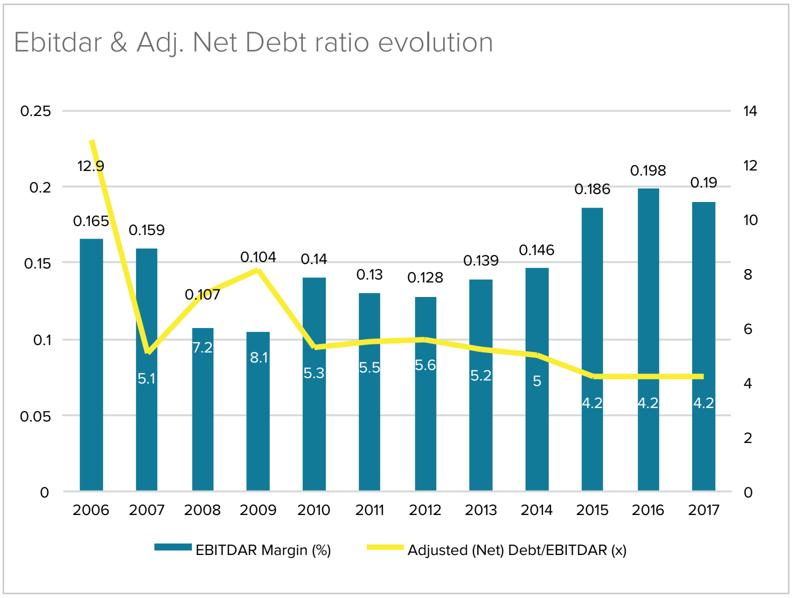
orderbooks of manufacturing firms are also experiencing some moderation in their development because of the political frictions arising from protectionism and tariffs. This is visible in the export orderbooks of several countries (China and the US, but also Germany, Japan or South Korea), and therefore could be indicative of a global slowdown in global trade conditions. Nevertheless, industry freight tonne kilometres (FTK) grew 4.7% in the first half of 2018 and the forecast for the entire year is 4%, but unlike in the previous years, available freight tonne kilometres grew more than FTK, resulting in a lower load factor of 44.7% (down 0.6 points against the first half of 2017).

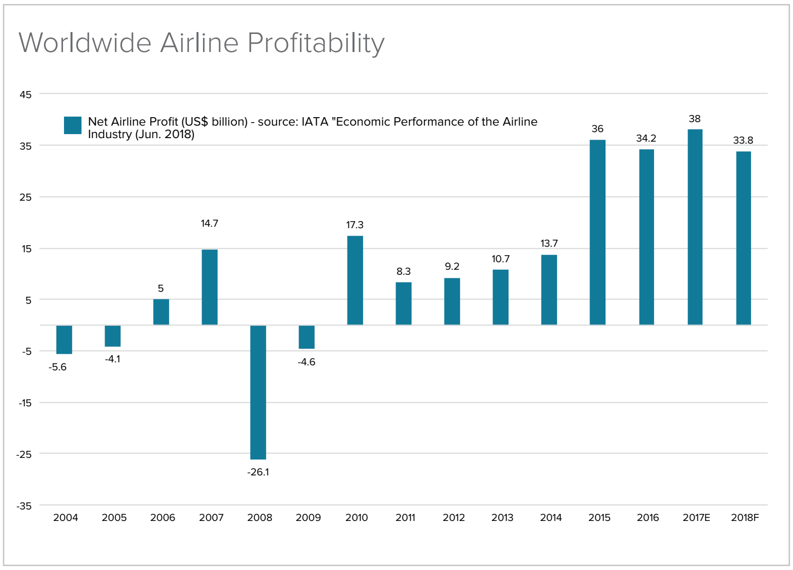
At regional level, Asia-Pacific (which is the biggest air cargo market with about one-third of the total) experienced a growth of 4.6% on a 6.8% increase of capacity, which resulted in a decrease of 1.1 points of load factor.

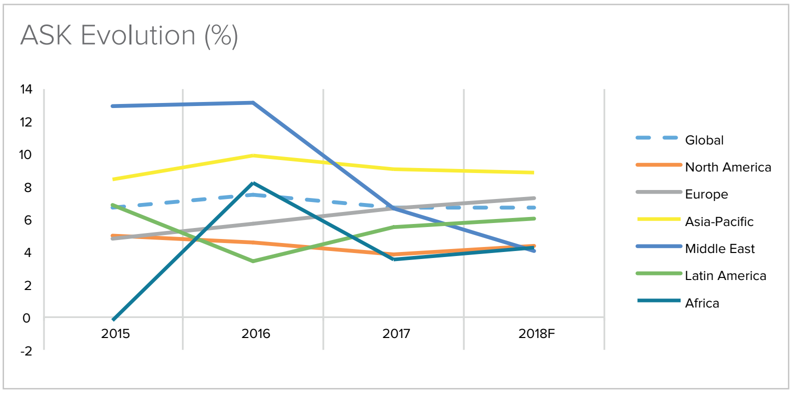
While demand is growing below capacity, the continuous positive development of cargo yields has helped the performance of revenues in the first half of 2018, as yields reached $1.8 to $2 a kilo, up from the $1.55 to $1.6 both in 2016 and 2017. Nonetheless, the outlook for the rest of 2018 is less optimistic, and there seems to be a consensus that world trade is weakening, with these developments visible not only on airfreight markets but also on containerised trade, where container throughput index reached peak growth rates of close to 8% in third quarter of 2017 but is now down to below 4% levels.

It is worth highlighting the role that developing and/or emerging economies have in passenger demand and, therefore, on aircraft demand. A key element of the air traffic growth over the past 20 years has been the establishment of new routes or city-pairs, particularly by LCCs. During that time the number of city-pairs has gone from about 10,000 to 21,000, enabling passengers travel options not even fathomable a few years ago. Where in mature markets the traffic growth used to be a multiple of between 1.3 and 1.7 times GDP growth, in new markets (new routes), and provided some minimum requirements are met (infrastructure, payment methods), the first driver of growth is the capacity deployed – ie, the number of seats available – and therefore the resulting traffic growth is not correlated with GDP, but rather with new aircraft flying those previously non-existing routes.

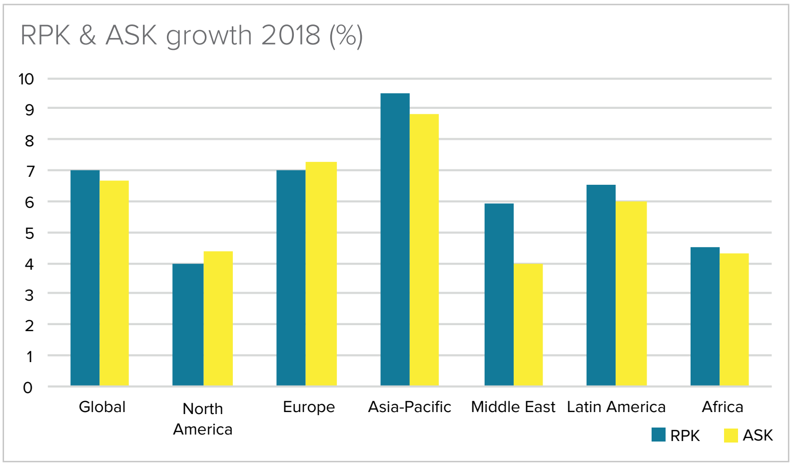




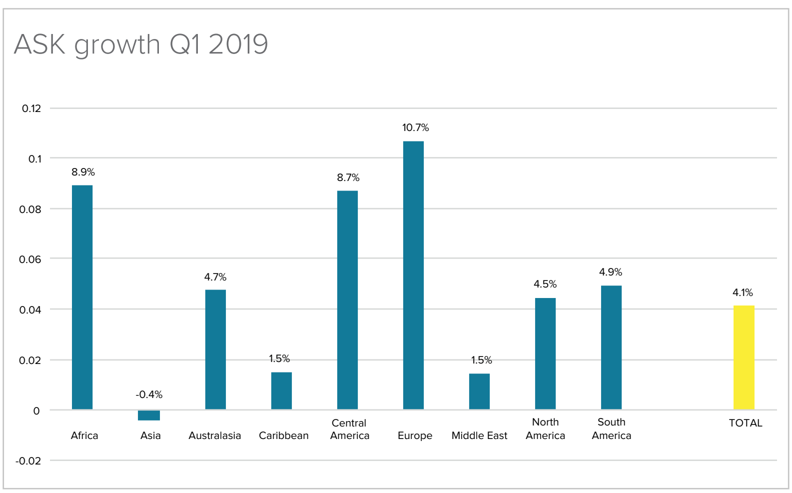




ASK Evolution (%)



RPK & ASK growth 2018 (%)



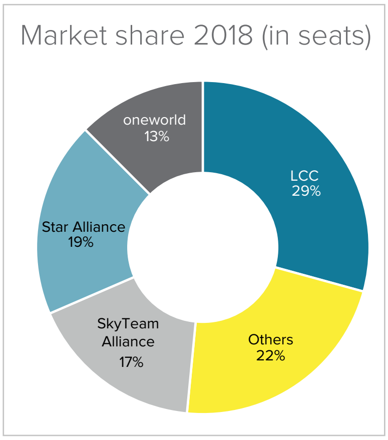
ASK growth Q1 2019

This leads to the following question: how far can this generation of new city-pairs go? Likewise, the second key factor for this traffic development is the introduction of low fares by airlines to the public. Some airlines have been pioneers at developing the LCC concept, but even those seem to have reached the bottom when it comes to unitary costs, and it might be difficult for them to improve further that cost advantage in order to generate traffic. Hence, the next question: how much traffic can be stimulated by low (but not lower) fares?

On the costs side, fuel remains a key driver, and with current prices up 37.5% compared with one year ago, it is certainly a threat to profitability that airlines need to manage. The second main cost driver is labour, where pressures are mounting not only on the salary side but also on the access to flight crews, which is quickly becoming an issue for many airlines (and which no doubt unions will try to use in order to obtain concessions from airlines' management).

The third main cost driver is the cost of aircraft, where airlines seem to be enjoying a benign enough environment given a) the increased competition among aircraft providers (original equipment manufacturers and lessors) and b) increased competition among financiers because of low interest rates, and, as a result, airlines can achieve lower aircraft costs, which they might lock in for the next couple of years.

Even if we are only halfway through the year, it is reasonable to assume that the final financial results for the global airlines in 2018 will be below those of 2017. Demand remains extraordinarily strong, with record load factors across the system and with yields showing a stable development, but unit costs are growing because of fuel prices and labour pressures. Nevertheless, 2018 results will still be overly positive and 0.9 points above the cost of capital (WACC), with Iata forecasting $33.8 billion net profit for the year. While this is below 2017 figures ($38 billion net profit and two points above WACC), it is still a quite remarkable figure that somehow shows that the industry can – at least for the time being – still generate shareholder returns in a higher cost fuel environment. The bigger players in the industry have shown a very distinct focus in managing profitability, and this focus seems to be slowly extending throughout the industry. We must not forget that one way of achieving this profitability is through the acquisition of competitors, and even if at a relatively slow pace, consolidation is also developing in Europe – and to a lesser extent in Asia. Needless to say, one of the benefits (at least in theory) of acquisitions is also the acquisition of assets. However, taking into account the current profitability levels, some



potential acquisition targets might be deemed too expensive, and the bigger players in the industry have certainly the financial capability and strong strategic positioning to be able to wait until the next downturn and buy at potentially distressed prices.

Equipment market

After several years of increasing sales volumes, a temporary commercial jet order slow down started in 2015. This downward trend continued into 2016 as well as over the first 11 months of 2017. In December 2017, however, the industry witnessed an order explosion, predominantly Airbus aircraft. Industry speculation suggests the December miracle was effectively the last hurrah from Airbus's retiring super salesman John Leahy, who in his final year with the European manufacturer was eager to beat Boeing in terms of annual sales volume.

According to the latest Flight Fleets gross order figures (western-built jets, airlines, finance and professionals) at the end of July, order volumes exceed 2017's level at the same point in time by about 40% and the 2016 level by only 4%. As it seems unlikely a similar order boom will occur in the second half of 2018, it may end up about 2,200-2,400 for full-year 2018. Obviously, a few mega-orders can change this number dramatically. The number of commitments and options placed during the 2018 Farnborough air show was close to the level placed at the very successful Paris air show in 2013. If all these LoIs, MoUs and options are firmed up the second half of 2018, the end-year total could also bring a surprise.

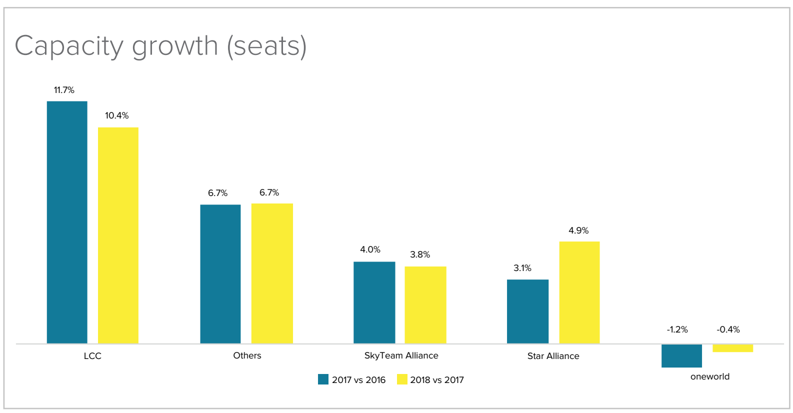
According to the Flight Fleets data, over the first seven months of 2018, a total of 1,112 commercial aircraft was sold, of which 678 were single aisles, 263 twin aisles, including widebody freighters, 129 regional jets and 42 turboprops.

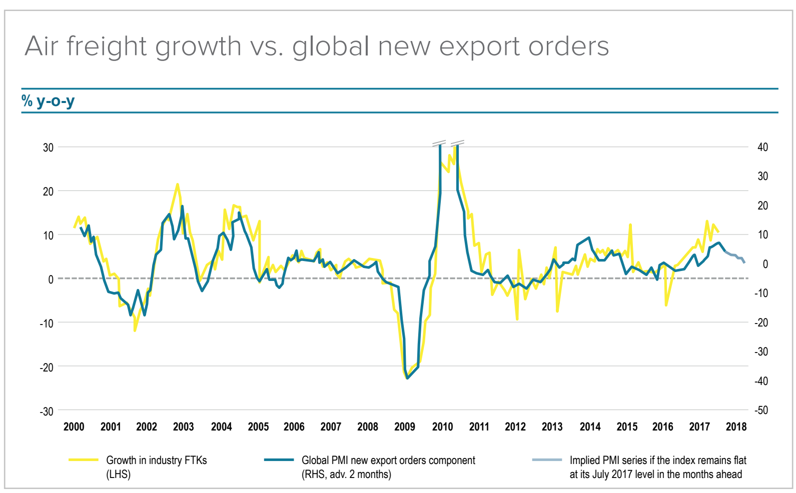
The already full orderbook, as well as the low fuel price, could be used to explain the slight softening of the new equipment market last year. It could be argued that now that fuel prices seem to be on the rise again, another order wave for new aircraft is building, especially against the background of traffic growth of 7% or better.

This year has seen only a few new aircraft types enter service. Qatar Airways received the first A350-1000 in February, while in March, Singapore Airways got the first 787-10. In the same month, Thai Lion Air received the first 737 Max-9, while, in April, Wideroe completed the first commercial flight of an Embraer E190-E2. Egyptair took delivery of the first converted A330-200 P2F freighter and West Atlantic the first Boeing-converted 737-800 (BCF) freighter. The first delivery of an A330-900 to TAP has been postponed until September.

In terms of sales successes the 737 Max and A320neo family still dominate the scene. Boeing received sizable orders for the Max from Southwest Airlines, Ryanair, UTAir, Gol, and lessors Jackson Square and Goshawk Aviation. The Neo booked double-digit orders from SAS, Jetblue Airways, Aegean Airlines, and lessors Macquarie, Goshawk and China Aircraft Leasing. The E-Jets got bigger orders from United Airlines and Envoy for the E175 scope clause special and from Wataniya Airways for the new E195-E2. Unfortunately, Embraer also lost an important order from Air Costa. PSA and Skywest selected the competing Bombardier CRJ900.

In the twin-aisle segment, Boeing sold significant numbers of the 787s





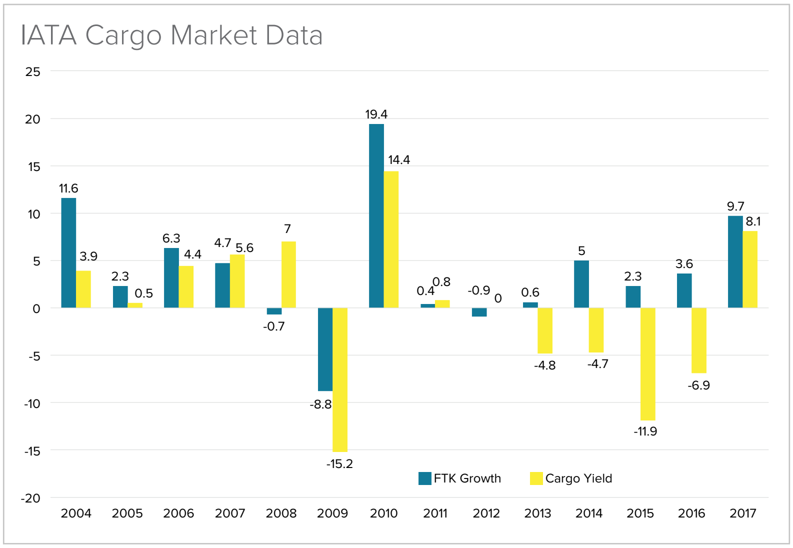
to American Airlines, Turkish Airlines and Hawaiian Airlines. Also for the Boeing freighter types, the first half of 2018 brought good sales volume from especially the integrators, among others with orders for the 767-300ERF from FedEx, the 777-200LRF from DHL and the 747-8F from UPS.

Airbus also booked good order volumes outside the A320 family. The original equipment manufacturer (OEM) booked double-digit twin-aisle orders from Turkish Airlines and Sichuan Airlines for the A350 and Emirates threw a lifeline for the A380 in a year when used aircraft of this type encountered mixed fortunes. Some were taken over by Portuguese charter airline Hi Fly for continued operations, while others were parked in Tarbes, maybe permanently.

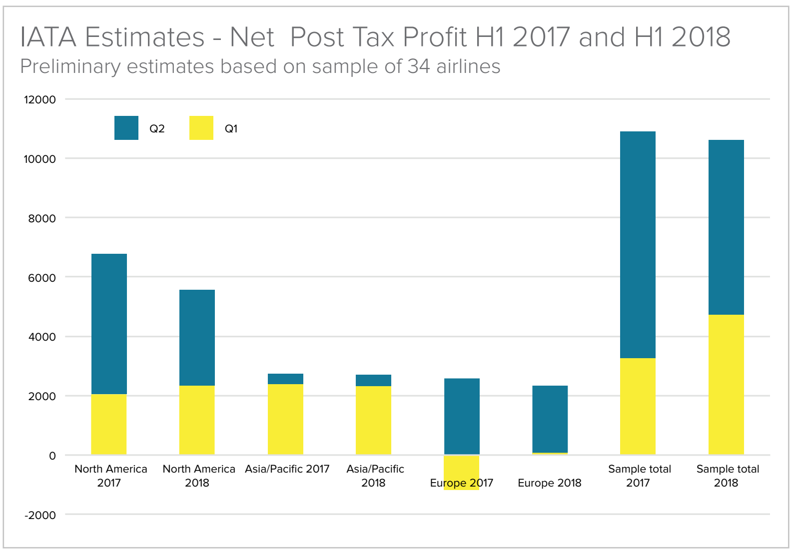
Looking beyond the most recent sales successes, how are the various programmes progressing? The table, which includes a small number of corporate jet and (semi) military versions as well, shows the current backlog by aircraft family and main versions or variants. Overall, the backlog is still impressive, with almost 14,000 firm orders plus 3,000 options. With about 5,700 orders outstanding, the A320neo family clearly remains the top-seller in the market. Within this family, the A320neo is the most popular version, followed by the A321neo, both in the old version and in the new, increasingly popular Airbus Cabin Flex (ACF) version. The CFM LEAP-powered A320/A321neos are in the lead over the Pratt & Whitney Geared Turbo Fan (GTF) version, but a large number of orders have an undecided engine selection.

The A320neo engines have been a hot topic during the past months. Production volumes of, in particular, the Pratt & Whitney PW1100G GTF was behind plan and the entry into service has been plagued by a number of technical problems. While Airbus is planning to ramp up production to 60 a month in two years, still only 154 A320neos were delivered (of which 96 were LEAP-powered).

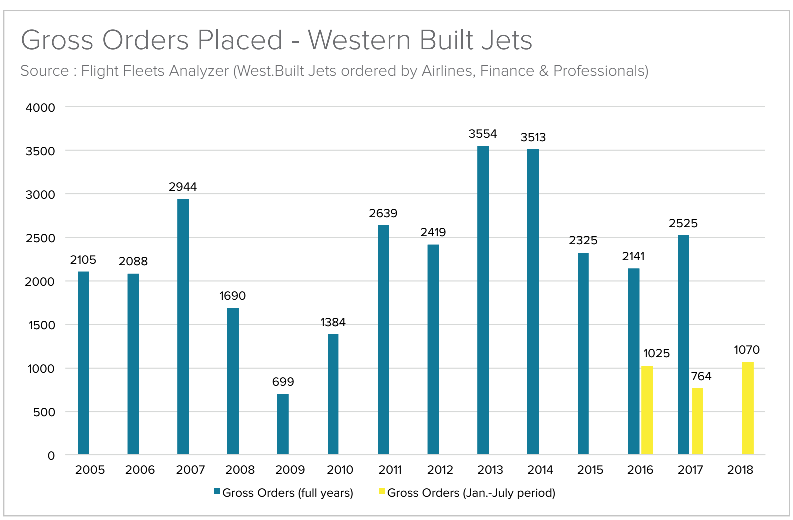
Demand for spare engines is high because of technical problems plaguing in-service aircraft, such as rotor-bow, prematurely deteriorating combustor liners and carbon seals and, in some cases, in-flight shut



IATA Cargo Market Data



IATA Estimates - Net Post Tax Profit H1 2017 and H1 2018
Preliminary estimates based on sample of 34 airlines



Gross Orders Placed - Western Built Jets
Source : Flight Fleets Analyzer (West.Built Jets ordered by Airlines, Finance & Professionals)

Gross Orders Placed Jan-July 2018

(Source : Flight Fleets Analyzer)

Single Aisles		**678**
737 Max 8	125	
737 Max 10	3	
737 Max	321	
A319neo	26	
A320neo	129	
A321neo	52	
A319ceo	5	
A320ceo	15	
A321ceo	2	
Regional Jets		**129**
A220-300 (CS300)	30	
E175 E1	44	
E195 E2	3	
E195 E2	13	
CRJ900	39	
Twin Aisles / WB Freighters		**263**
767-300ERF	20	
787-8	26	
787-9	79	
A350-900	58	
A330-200	2	
A330-300	1	
A330-900neo	10	
777-200LRF	31	
777-300ER	2	
747-8F	14	
A380-800	20	
Turboprops		**42**
ATR 42-600	13	
ATR 72-600	10	
DHC-8-400 (Q400)	16	
DHC-6-400	2	
Do 228NG	1	
Total		**1112**

downs. P&W indicated that later in new – redesigned – parts would be introduced to solve some of the problems. Some airlines decided to stick to the proven A320 for the time being. While the backlog for the type is still meaningful at more than 250, order intake is slowing down. The same goes for the 737NG, for which the backlog is about 230.

Its successor, the 737 Max, has a backlog of well over 4,400 aircraft with another 600 on option. The market share of the 737 Max family in the single-aisle market seems to be falling behind the A320neo, although admittedly the 737 Max was launched some months after its European competitor. With open commitments of about 5,000 units, however, this should not worry the Seattle-based manufacturer too much.

Within the 737 Max family, the Max-8 is clearly the most popular version. Its backlog of more than 2,100 units (2,350 including the Max 8-200) dwarfs the backlogs of the Max-7, Max-9 and the new Max-10. Effectively, the launch of the Max-10 has diluted the position of the Max-9 because a significant number of version swaps was reported. Unfortunately, there is no clarity about 1,400 737 Max orders, for which the exact version remains undecided or unannounced.

With a still modest – relative to the mainstream single aisles – backlog for the regional jets, the A350 and 787 twin-aisle families take third and fourth position in the current backlog chart. While this market was very soft last year, 2018 saw a modest firming up, albeit partly thanks to freighter orders. The A350-900 XWB features a backlog of 536 aircraft, supplemented by 164 orders for the stretched -1000 XWB. Airbus had to face reality for the A350-800 XWB and that version was aborted.

Within the Boeing 787 family, the -9 is clearly the most popular version, and with a very limited order inflow in the past few years for the shorter -8, the -9 is likely to become the standard version, similar to the -300ER as the standard version of the old 767 family. A redesigned version of the 787-8 that potentially could be offered at a more competitive price could revive the fortunes of the smallest member of the 787 family. The redesign seems mainly a defensive measure against the A330. The double-stretched 787-10 is likely to become a bigger sales success compared with its equivalent in the 767 family, the 767-400ER, but with a sales volume of only 165, there is still some ground to cover.

In the regional jet market, Bombardier's position is not totally clear. After spinning off the CSeries to Airbus, all that remains are two very mature products, the CRJ regional jet, effectively now only the CRJ900, plus the Q400 turboprop. Both face strong competition, and it is difficult to see how these two products are enough to ensure Bombardier's position as a commercial aircraft manufacturer, or if the future of the Canadian OEM will see it focus purely on corporate aircraft.

While Embraer lost an important customer (50 E2s) when Indian carrier Air Costa suspended services, the Brazilian manufacturer announced

Western Built Jets - Backlog as per 25, August 2018

Source: Flight Fleets Analyzer

Type	Versions / Variants					
	E170	E175	E190	E195		
Embraer E-Jets E1	0(6)	110(142)	40(55)	6(2)		
Embraer E-Jets E2		100(0)	46(40)	94(35)		
	MAX7	MAX8	MAX8-200	MAX9	MAX10	MAX?
Boeng 737MAX	65(0)	2127(260)	235(75)	131(100)	436(10)	1483(158)
	-700	-800	-900ER			
Boeing 737NG	3(0)	188(6)	38(0)			
	B747-8F					
Boeing 747	22(0)					
	B767-300ER					
Boeing 767	68(40)					
	-200LR	-200LRF	-300ER	-8	-9	-8/9
Boeing 777	0(2)	58(0)	42(5)	53(0)	263(56)	10(12)
	-8	-9	-10	-?		
Boeing 787	93(35)	407(105)	165(24)	0(66)		
	-100	-300	-?			
Airbus A220 (CSeries)	115(96)	246(131)	0(20)			
	A319	A320	A321	A321ACF		
Airbus A320NEO	55(0)	3766(619)	1474(386)	421(0)		
	A319	A320	A321			
Airbus A320CEO	20(0)	119(29)	117(0)			
	-200	-200F	-300	-800	-900	
Airbus A330	16(4)	4(8)	38(0)	0(6)	224(0)	
	-900	-1000	-?			
Airbus A350	536(114)	164(23)	0(66)			
	-800					
Airbus A380	102(26)					
Bombardier CRJ	-700	-900	-1000			
	1(0)	57(28)	6(0)			
Embraer ERJ135	13(10)					
Mitsubishi MRJ90	213(174)					
Overall Total :	13990 (2974)				Firm Orders (Options)	

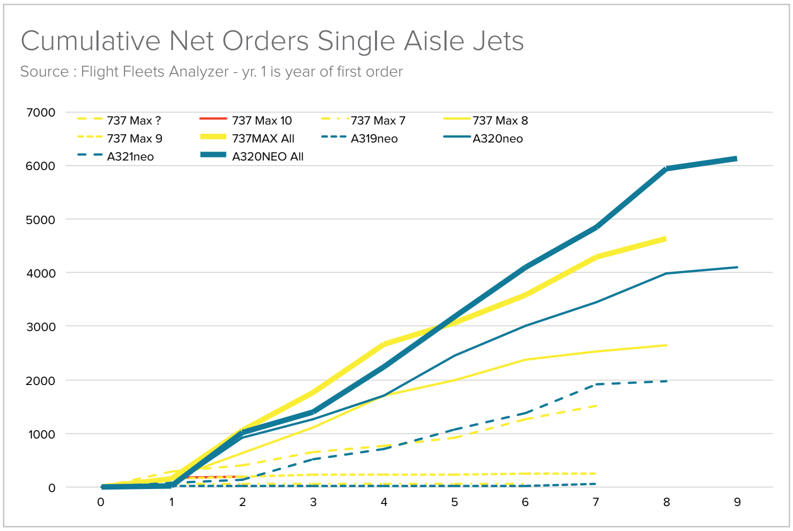
an impressive number of new commitments during Farnborough this year. Given the arguably increased competitiveness of the CSeries in its new A220 guise, it is more important than ever for the Brazilian manufacturer to establish its E2 products. The total order backlog of 240 aircraft plus 75 options is fairly evenly spread over the three versions, E175-E2, E190-E2 and E195-E2. The E2's predecessors, the original GE CF34-powered E-Jet E1, still enjoy a backlog of 200-plus aircraft. The E175, especially, remains popular with the US regional airlines.

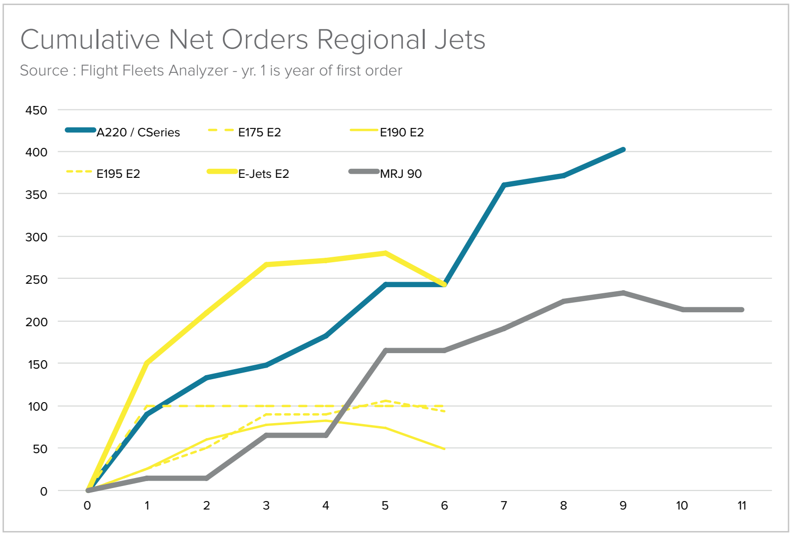
Unfortunately for Embraer, the E175-E2 is not scope-compliant. Under current scope clauses, the E2's maximum take-off eight (MTOW) is slightly too high. Scope clauses limit the number and capacity as well as the MTOW of aircraft that are operated by commuter airlines on contracts with the US major operators. These scope clauses are negotiated between the US major airlines and the pilot unions. Embraer hopes that during the next contract negotiations, scope clauses will be more liberal, but initial responses from the unions indicate this may be a tough fight.

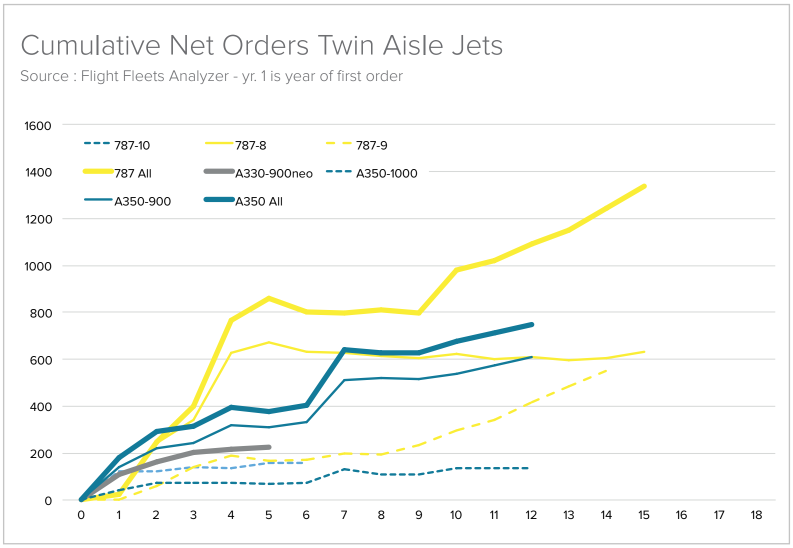
United will be the next US major to negotiate pilot contracts in early 2019. The scope clause in United's deal with the Air Line Pilots Association limits it to 255 large regional aircraft (up to 76 seats and MTOW of 86,000lb). Delta will follow in December 2019 and American at the end of 2020.

The same issue is causing Mitsubishi Aircraft Corporation headaches with its MRJ90. The type can be configured with up to 90 seats, although also in a two-class configuration to meet the 76-seat scope clause restriction. It will be more difficult to meet the MTOW restriction. The MRJ90's MTOW ranges from 87,300lb for the MRJ90STD to 90,300lb for the MRJ90ER and just over 94,000lb for the MRJ90LR. Restricting the MTOW to 86,000lb would result in a clear range shortfall with passengers on board.

The MRJ90's backlog has dropped to 213 since last year: Eastern Airlines cancelled 20 aircraft and no new orders have been announced in recent months. Given the scope clause issue, it is interesting to see if







anything happens to the orders from Trans States Holding and Skywest. Taking the time since the launch of the programme into account, the MRJ is losing ground versus the A220 and the E2 products. The first MRJ delivery to All Nippon Airways is still scheduled for mid-2020. As an alternative for the MRJ90, the Japanese company may also refocus on the smaller MRJ70, which will not be scope clause-restricted, or even a larger MRJ100X version.

In the larger twin-aisle category, the A330's backlog is now reduced to about 58 aircraft. The majority is for the A330-300HGW and a few more -200s. During the first half of 2018, the order stream for the A330-200/-300 almost dried up. The A330 still is a workhorse for many operators. Some airlines expressed the desire to acquire additional used A330s to supplement their fleet. With prevailing market values and the low fuel cost, the A330 is an excellent entry-level twin aisle, with the -200 and -300 HGW variant producing decent long-range performance.

Airbus launched the A330neo to plug the gap left behind by the cancelled A350-800 XWB. At that time, fuel costs were still relatively high and the fuel cost savings offered by the A330neo looked favourable, especially in combination with a relatively low capital cost, compared with modern hi-tech long-range aircraft such as the 787 and A350.

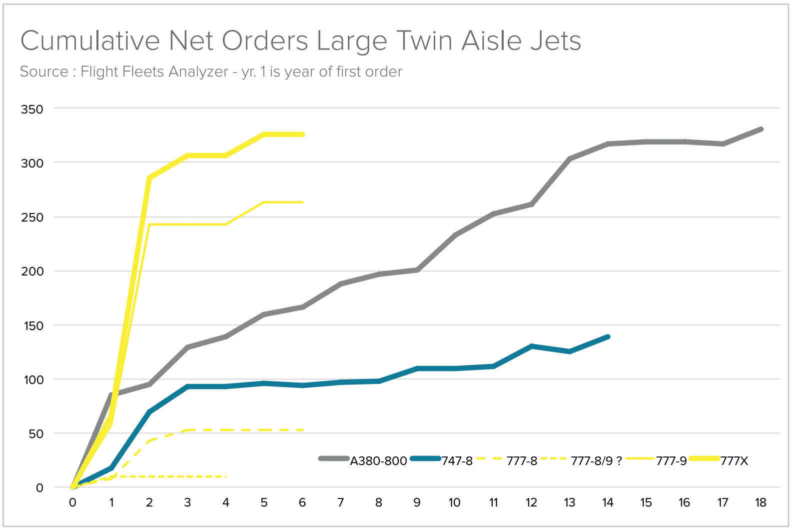
The launch success of the A330neo was impressive, with 110 net orders in the second half of 2014. However, in 2015, the net order intake dropped to 52. In 2016, Airbus sold only 42 A330neos, of which 28 of the Rolls-Royce-powered aircraft are destined for Iran Air. Ten more Neos were sold in 2017 and another 10 during the first half of 2018 (excluding the additional 34 Airasia X aircraft).

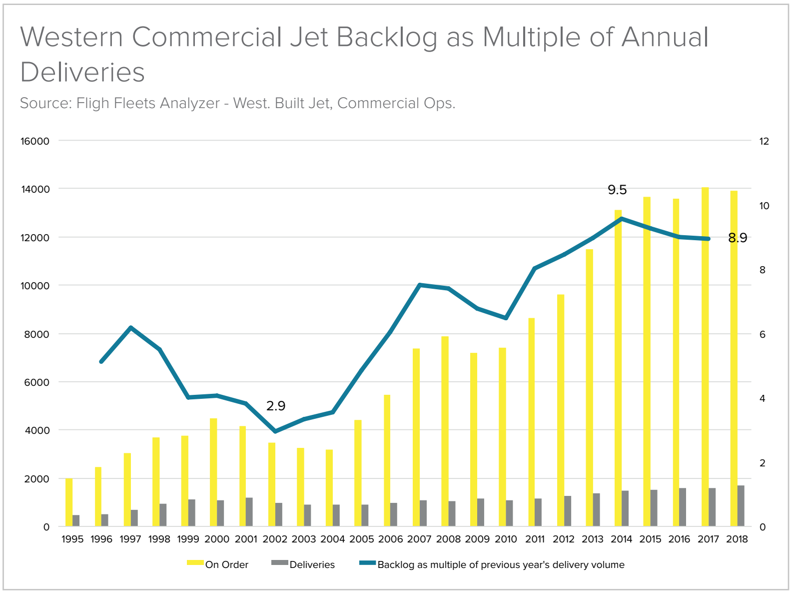
Fortunately for the European manufacturer, the Neo's biggest customer, Airasia X, reconfirmed its order for 66 A330-900s and added 34 more in July after initial indications the Asian airline contemplated a switch to the 787 models. The shorter A330-800 does not seem to be too popular, with only one order, for two aircraft, from Uganda Airlines after all other orders were cancelled. Does it really make sense to build an aircraft for effectively one customer?

The A330-900 enjoys some popularity with the lessor community as Air Lease (ALC) and Avolon (including CIT) committed to the type. Airasia X (100) and Delta (25) are the largest A330neo customers after Iran Air (28).

Like the transition in the A330 product range, Boeing is facing a similar change for its large twin-aisle 777 family. Since January, Boeing has booked 26 net orders for the 777 classic. No less than 31 freighters have been sold, plus two passenger versions to Swiss. Unannounced customers cancelled seven 777-300ERs. As long as no freighter versions of the new-technology twin aisles are announced, the 777-200LRF will be the preferred long-haul heavy freighter by many airlines. It remains unclear if Boeing or Bedek IAI will eventually launch a P2F-conversion programme for the 777-200LR, and in recent months there was speculation about a potential 777-300ER P2F programme. The potential feedstock for a -300ER conversion will probably be more plentiful compared with the niche -200LR.

The new-generation Boeing 777X has already clocked up an impressive





number of orders for such a large aircraft. However, out of the total of 326 orders, the vast majority, 235, is coming from the three big Middle East carriers, with Emirates Airline having signed up for no less than 150 of the type. Cathay Pacific (21), ANA (20) and Lufthansa (20) are the main non-Middle East customers. There were also 30 ordered from unannounced commercial operators. Singapore Airlines preferred the 777-9X to the A350-1200 XWB in a 2018 campaign and became the latest customer for the type.

Should the big quads, the 747 and A380, follow the other quads and trijets into the aviation history books? Boeing once more dominates the top end of the market with the 777-9X. This could change should Airbus decide to launch the stretched A350-1200 XWB. Such an aircraft would require new or upgraded engines and would probably be another nail in the coffin of the current A380, which makes this a tough decision for Toulouse.

In the top segment of very large aircraft, Boeing has the 747-8I as a contender next to the future 777-9X. Airbus puts the mighty A380 against this duo. Both the 747-8I passenger jet and the A380 are struggling to find new orders. The Boeing product survives on orders for the -8F (freighter version), but the US manufacturer announced that the 747 production will be reduced to half an aircraft a month, which with the 22 aircraft-strong firm backlog plus LoIs for 16 more, implies production ending in about three years' time.

Airbus announced it would reduce A380 annual deliveries to 12 units in 2018 from 27 last year. It plans to deliver eight A380s in 2019. The backlog counts 102 firm aircraft plus 26 options, of which 58 are destined to go to Emirates. Amadeo has committed to 20 aircraft, Qantas to eight more and an unannounced customer to 10. Realistically, it is difficult to see Amadeo taking all of these aircraft unless playing a role as a finance vehicle for Qatar or another airline. Given the current discussion around residual values and three A380 parked in Tarbes, it seems unlikely that investors would be eager to take asset risk on this aircraft type.

Qantas has reportedly said it does not intend taking delivery of the aircraft, and some customers seem to be special purpose companies, so, overall, a realistic backlog may be about 70 aircraft. A new version – the A380plus – was proposed during the Paris air show last year. The A380plus features a modified wing, bigger winglets, a lighter and improved waste system, new fuel pumps, new interior options, new belly fairings, plus a three-ton increase in MTOW. It remains to be seen if this plus package will be enough to revive the market interest in the A380 – the type was absent from Farnborough this year, despite Airbus's expectation to sell another five of six in 2018.

It seems the used Doric/ex-Singapore A380 taken by Hi Fly is very popular in the ACMI and ad-hoc charter market at the moment, mainly to replace grounded 787s that are awaiting repair, exchange or modification of the problematic Rolls-Royce Trent 1000 Pack B and C engines. It was reported that, in mid-2018, no less than 44 Rolls-Royce powered 787s were parked because of IP turbine and compressor blade problems. Indications are that the problems will not be solved until the second half of 2019 at best.

With encouraging sales volumes in the first months of 2018, the manufacturers do not have to worry too much because the global fleet is still growing fast. The rise of Airbus has been spectacular and it is worth speculating whether 25 years from now a major Russian or – more likely – Chinese OEM will feature in the list of major manufacturers and if Bombardier and Embraer will still be around or if they will follow McDonnell Douglas, Fokker, Lockheed and others into the history books.

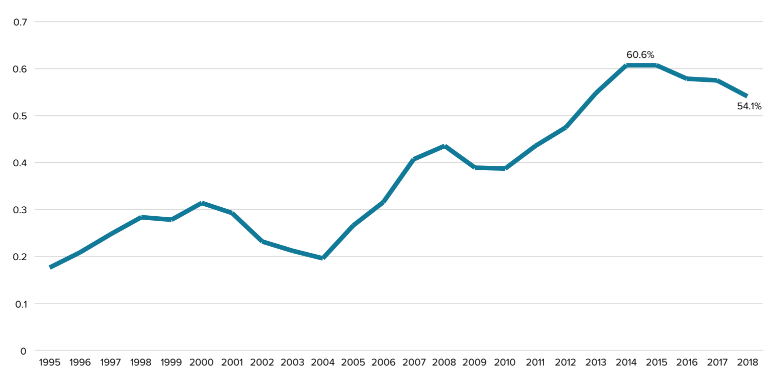
In the shorter term, Airbus and Boeing and, to a much lesser extent, the regional jet manufacturers can enjoy a backlog, equal to 8.9 years of deliveries at 2017 levels. That figure, however, is slightly down from the 9.6 multiple achieved a few years ago, but this is the result of a slightly lower backlog combined with increasing delivery volumes. Deliveries are expected to increase significantly in coming years as the OEMs regain control over their suppliers and the engine manufacturers are able to deliver the required volumes.

The limits in production capacity is one of the major elements that protects commercial aviation. The commercial jet backlog stands at 54.1% of the in-service fleet, significantly lower than the peak level of about 60.6% at end 2014-early 2015.

Whatever the cause, huge backlogs, a lack of new aircraft introductions, modest fuel prices, over-ordering or economic headwinds, there are now strong indications that the new equipment market is past its absolute peak but so far there are no indications of a real downward trend in demand. For the first seven months of 2018, a total of 855 deliveries (western-built jets, commercial operations) was recorded, slightly up on the 837 over

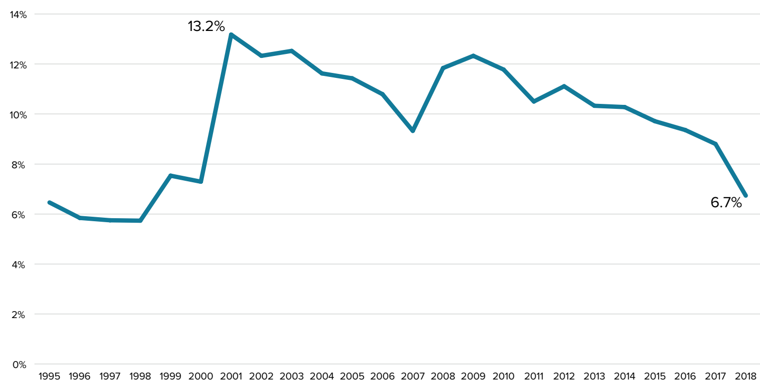
Number of Aircraft on Order as % of In Service Fleet

Source: Flight Fleets Analyzer - Western Built Jets - Commercial Ops.



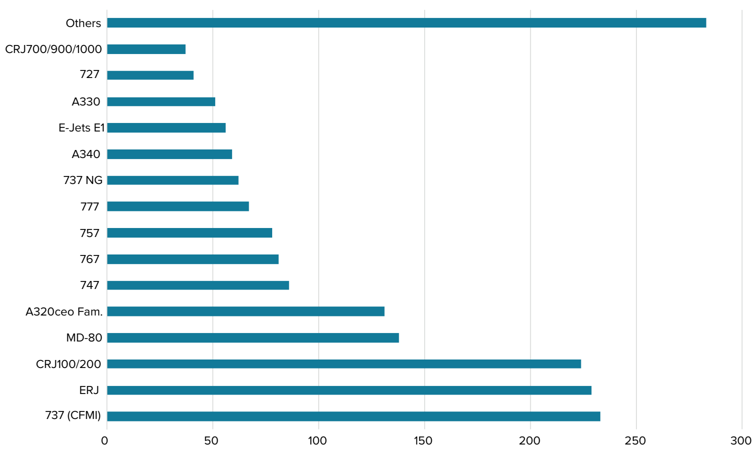
Aircraft in Storage as % of In Service + Stored Fleet

Source: Flight Fleets Analyzer - Western Built Jets - Commercial Ops



Total Western Built Jets In Storage

Source: Flight Fleets Analyzer - Western Jet, Commercial Ops.



the same period last year and 849 in 2016. Much of this seems to be related to the volume of PW1000G and LEAP 1A and B engines that Pratt & Whitney and CFMI are able to deliver to the A320neo and 737 Max assembly lines.

The first months of 2018 also show a picture that seems to indicate fundamentally the equipment market is still healthy from order deferrals and cancellations. While the numbers for 2018 are still low, both deferrals and cancellation events (cancelled order, options, LoIs, etc) are slightly up against 2016 and 2017. Obviously, there is no complete transparency regarding order deferrals and cancellations, and it is unlikely all agreements to cancel or defer are included in the published industry statistics. In the past, orders from, for instance, defaulted carriers such as Kingfisher Airlines or Air Costa stayed on the orderbooks for a longer time (months, sometimes years), probably for legal reasons. Based on available data, the number of cancellations for the first seven months of 2018 increased to 402, versus 322 during the same period in 2017 and 527 in 2016.

Out of the 402 cancellation events, 263 were originally announced as firm orders. Jet Airways cancelled no less than 91 737 Max aircraft, defaulted Air Costa cancelled 50 E2 jets, UT Air will not take 30 Boeing 737NGs for the same reason. Other noteworthy cancellations included Virgin Atlantic's six A380s, Hawaiian's six A330-800s and Norwegian's six 787-9s. American cancelled 25 A350-900s, Transasia's order for six A321s was cancelled and so was 9 Air's order for six 737-800s. Sun Express cancelled seven -800s as well, while Air Europa cancelled four 787-9 aircraft.

For mid-life and ageing aircraft, the number of retirements went down from the already very low 442 recorded during the first seven months of 2017 to 245 in the same period of 2018. It should be taken into account that increasingly retirements occur because for an aircraft lessor, or investor, the sum of the return compensation (for aircraft that do not meet the agreed maintenance condition) plus the proceeds from a part out are more attractive than re-leasing the aircraft to a second-tier lessee. This is especially the case if the new lease requires a cash out to pay for a new or refurbished interior.

Over the past 12 months, 61 MD80/90s have been retired, 27 A320-family aircraft, 23 CRJs, 23 747s, 17 737 Classics, 27 767s, 11 757s and 14 A340s. More modern types were also cut up, including 14 737NGs, seven 777s and three A330s.

The number of aircraft in storage went down further to 1,856 (August 2018) compared with 2,360 at the same time last year. If expressed as a percentage of the in-service fleet, it is now 6.7% against 8.8% in 2017.

Aircraft leaving storage can be good news, if redeployed, or bad news, if broken up, so no conclusions can be drawn from small changes in the storage numbers. The type most prominent in the world's storage areas is the 737 Classic, followed by the 50-seater regional jets CRJ100/200 and ERJ135/145. Next is the MD80, followed by the 747, 767 and 757. The number of stored A320s and 777s is starting to increase as well. Storage figures for the 787 are also remarkably high, but these aircraft are temporarily stored awaiting engine repairs.

Used equipment market

In the used equipment market, the "sky is the limit" seems the current maxim, especially for financial investors and lessors. However, for this group it still seems important to remain realistic and analyse what the impact of the ongoing generation change is – or will be – on the used equipment market and, in particular, on aircraft values, especially should the industry eventually be confronted with a cyclical downturn.

If a new aircraft design offers better fuel burn and/or maintenance cost levels, the only way the older-technology aircraft can remain competitive is by lower capital costs – ie, lower purchase prices or lower lease rates. In the current situation with relatively low fuel prices, the monetary savings in terms of operating costs offered by a modern, fuel-efficient aircraft are relatively modest. Ignoring other benefits of the new-generation types (range, maintenance cost, passenger appeal, environmental impact, etc) the premium of the new-generation jets over the older products should be more modest, compared with the high-fuel environment of a few years ago.

On aircraft pricing, there are no public domain data concerning, for example, average net transaction price levels. As a proxy, we use independent appraiser data, in this case data from Flightglobal's Ascend. We have reflected the difference between estimated mid-year market values and lease rates for the years 2016 and 2017 and 2017 and 2018. In the used equipment market, it seems an increasing gap is developing between aircraft with leases attached and naked aircraft.

With significant appetite among financial investors for commercial aircraft, those types with a solid longer-term lease currently commend a premium. The potential buyers' group for these income-generating assets is significantly larger compared with the number of potential buyers for off-lease aircraft. Off-lease aircraft sales may be targeted at airlines which are looking for short-term fleet expansion or sophisticated lessors/traders which have the capability to arrange a new lease for the aircraft.

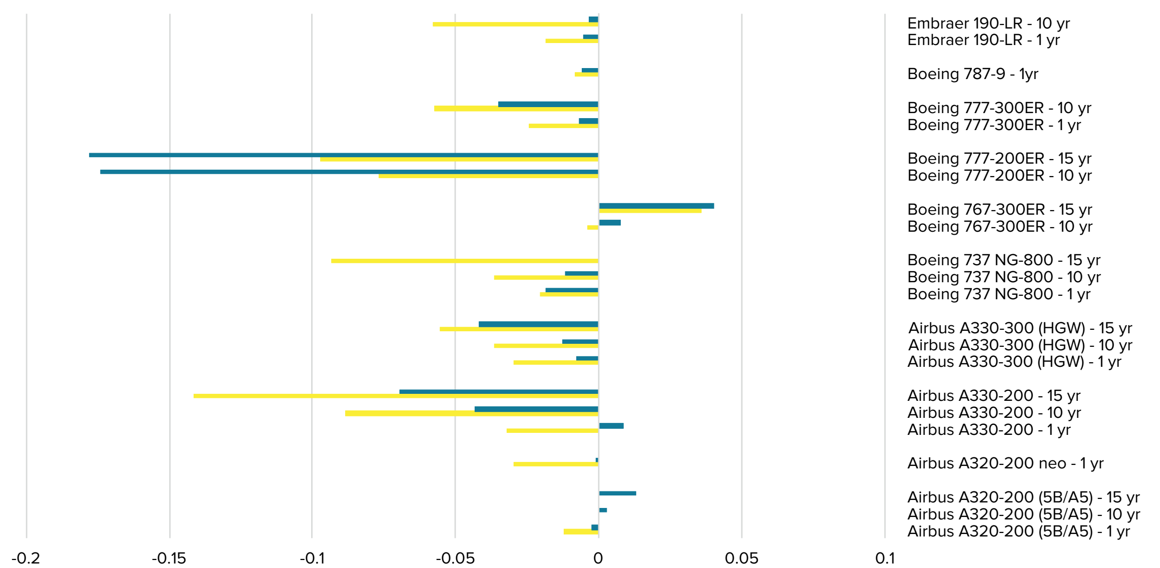
To analyse used equipment prices, we have compared Flightglobal's published current market value estimates for the mid-year points in 2016, 2017 and 2018. In the graphs, we have used constant age values for hypothetical aircraft of an age that can be seen as benchmarks for young to mid-life aircraft (one, 10, 15 years old) of the type. Consequently, the value dynamics do not take value effect of the physical ageing of an aircraft into account.

Given the various forms of transactions, it is difficult to quantify the size of the used equipment market. It seems simple airline-to-airline transactions are a minority now. In the lessor/investor market, individual aircraft with lease attached are traded, but also control over the asset-owning entity (for example, a special purpose company) can be transferred, leaving the legal owner unchanged. Next to individual aircraft, portfolios consisting of multiple aircraft are traded among lessors and investors and, finally, entire leasing companies are traded.

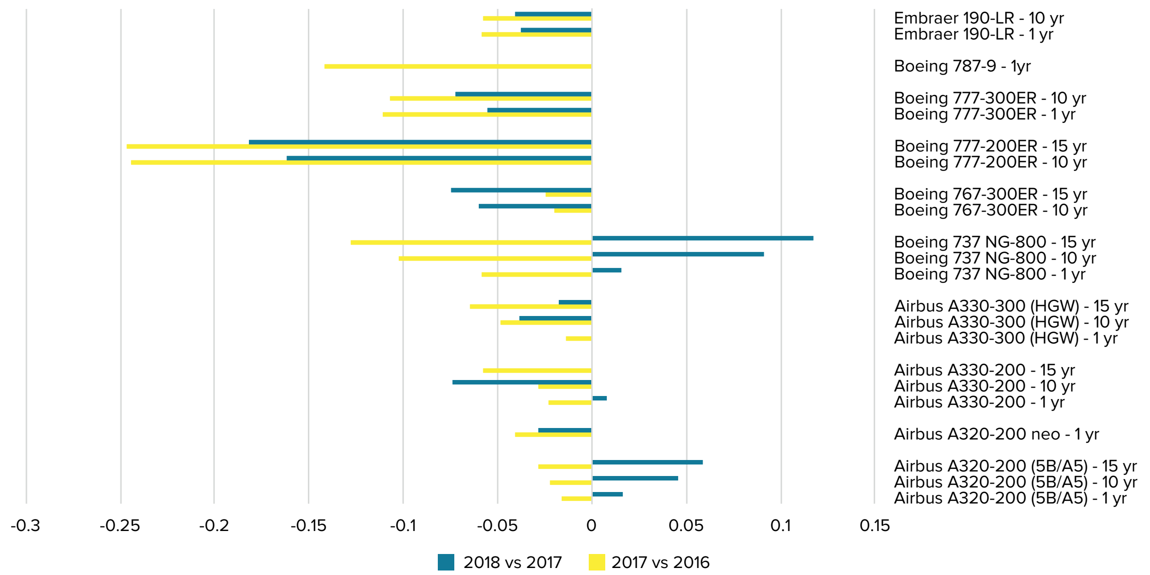
Just focusing on the simple metal market, it seems that over recent months, the market for modern single aisles has been strong. According to the Flightglobal lease rate data, current-technology aircraft such as the 737-800 and A320 have seen good improvements in lease rates. While the increased fuel price as such is a negative factor for these less fuel-efficient older-technology aircraft, the continuing high passenger growth, together with the delays in deliveries of the 737 Max and, in particular, the A320neo, is proving positive. Consequently, short-term availability of single aisles is at a premium and lease rates have been driven up. This is in contrast to, for example, the A320neo's availability further into the future.

Fuel prices are not yet at levels that the full premium lease rates – as expected when the programmes were launched – can be realised. In

Changes in Ascend HL Market Values 2018-2017 (constant age aircraft)



Changes in Ascend Lease Rates 2018-2017 (constant age aircraft)



addition, the problematic engines can cause significant headaches to operators because the required modifications or even replacement can cause significant downtime.

In the regional jet market, there is increasing pressure on, for example, E190s. Looking at the market for E-Jets, it seems that already we have seen a number of aircraft parted out at a relatively young age and an increasing number of E-Jets have difficulty finding new operators. A number of E-Jet operators have announced they will replace their fleets in coming years. Generally, this means a fragmentation of these fleets, which implies a significant number of new (smaller) operators need to be identified to take over the larger fleets.

Another issue with the first-generation E-Jets seems to be the relatively high maintenance cost, in particular the CF34 engines. Probably this is one of the reasons why young E-Jets have been parted out. For the future further value and lease rates, adjustments seem likely as the supply of used E-Jets increases.

In the twin-aisle segment, the unplanned grounding of significant numbers of 787s powered by Rolls-Royce Trent 1000 Package B and Package C engines has created demand for alternative lift. With the growth in passenger demand keeping all current-technology aircraft very busy, we have seen some airlines replacing 787s with the 747, A340 or even an A380. In particular, young A330-300s are still very popular in the twin-aisle segment. This cannot be said about the 777. The 777-200ER is the type that has seen the biggest negative lease-rate adjustment, albeit the market situation is different for Rolls-Royce-powered aircraft versus P&W- and GE-powered aircraft. An increasing number of 777-200ERs will be phased out and replaced by younger, more-efficient aircraft types. This increasing supply will require further lease-rate adjustments.

The 777-300ER is clearly still in an earlier phase of its life cycle, but also this type will see an increased supply as some of the larger operators replace it with more modern aircraft. While this development may take some time, it seems almost inevitable. One potential opportunity could be the development of a 777-300ER P2F cargo conversion programme, but the viability of this seems not to be a given yet.

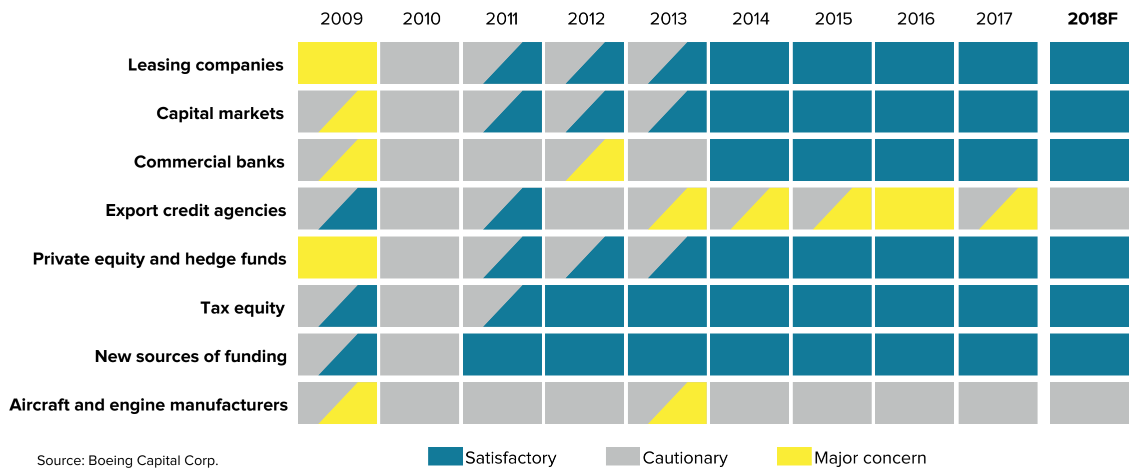
Moving from the lease-rate indicators to market values, once more the 777-200ER is the type that has been hit most, according to the Ascend numbers. The second-worst performing type here is the A330-200, in particular the older aircraft. It should be taken into account that with an increasing number of twin-aisles in the hands of investors and lessors, decisions around re-lease or part out increasingly becomes a matter of risk/reward calculations. The transfer of twin-aisle from one operator to another often requires significant investment in maintenance and interiors. As credit strength of secondary lessees will in many cases be inferior to the original lessee, investors run the risk that this – lessee-specific – investment cannot be recovered in case of an early termination of the lease because of a lessee default.

A winner is the 767-300ER. While this type seemed to be written off with the introduction of the 787 and A330neo, it still enjoys popularity with a number of operators. In addition, the type is enjoying increased appeal as feedstock for P2F cargo conversion. A number of integrators and e-commerce companies see the 767-300ERSF as an ideal platform for their operations.

Finance environment

As in previous years, to form a picture of the current aircraft finance

Boeing Capital Corp.: Aircraft Financing Environment



Source: Boeing Capital Corp.

market environment, the best source of information seems to be the major OEMs. They clearly are best positioned because they are the only ones which know all the details of the majority of transactions. Boeing Capital annually publishes some data about the finance environment.

This strong – some would say "overheated" – aircraft finance market ensures that aircraft with decent leases attached continued trading at very high levels. This is a completely different market from the metal market, where naked aircraft are bought and sold. Referring to Boeing's benchmark traffic-light chart for the aircraft finance market, for the first time in a decade there are no red lights and, except for export credit and OEM-financing, all lights are bright green. Clearly, OEM financing can hardly be expected to turn green because the manufacturers see their role mainly as providing a back-stop facility in case no other (commercial) financing is available.

Export credit obviously is difficult at the moment. While there are opportunities again to finance through non-American agencies, US Eximbank is still closed for what looks like political reasons. Boeing data reveals that before the financial crisis, the share of Eximbank export financing in Boeing deliveries fluctuated between 16% and 20%. During the crisis years, this jumped up to 30%, effectively as a solution to the feared and much discussed funding gap. After 2013, Eximbank financing went down, initially to pre-crisis levels, but in 2016, to a low of 4%. Boeing expects that for 2018, Eximbank financing may reach 5%, with the replacement product provided by AFIC adding about 5%.

One thing is beyond discussion: there is no more funding gap in the aviation industry. In the Boeing chart, effectively "leasing companies", "capital markets", "private equity/ hedge funds" and "commercial banks" could be printed in the brightest green available. A 2017 Boeing survey indicated that industry insiders expect that, over three years, operating lessors will be the largest source of aircraft financing. Currently, lessors manage about 41% of the commercial jet fleet in service, 45% of the aircraft in storage and only 22% of the jets on order. Based on the survey, there apparently still is room for growth in aircraft leasing. According to Boeing data, lessors acquire their products for 49% via direct purchases and 51% via sale and leasebacks.

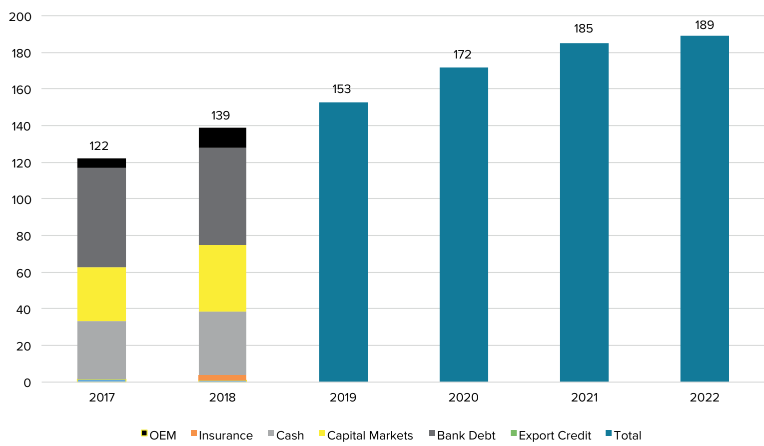
Commercial bank debt is projected to account for 35% of the value of Boeing's 2018 deliveries, followed by the capital markets that fulfill 29% of the finance need, with the remaining difference largely made up by cash (26%). It should be taken into account that lessors rely largely on capital markets (36%), bank debt (34%) and internally generated cash (25%). For 2018, export credit is seen at an insignificant 3% of total market funding for lessors, next to 2% coming from insurance (AFIC). Boeing also concludes that because of improved lessor ratings, 72% of their borrowing is now unsecured, against 28% secured.

GECAS is number one by fleet size in the latest lessor rankings, whereas AerCap takes the crown for most valuable aircraft portfolio. Avolon is ranked at number three in both charts. The prize for lessor orders currently belongs to ALC.

In recent years, there has been a demonstrable shift in the size of operating lessors, with a trend towards upscaling to achieve better economy of scales. This has fuelled M&A activity in the sector beginning with AerCap's ground-breaking acquisition of ILFC in December 2013. The merger with Hong Kong Aviation Capital in 2016 and the acquisition of CIT Leasing in 2017 has propelled Avolon to the third-largest lessor in just seven years. In the past 12 months, there have been numerous large portfolio sales between lessors, as some of the larger lessors took advantage of the attractive pricing driven by the robust market. AWAS sold 40 aircraft to Macquarie in 2015 ahead of its full sale to DAE Capital in 2017. Goshawk Aviation, owned by Chow Tai Fook Enterprises and NWS Holdings agreed to buy a unit of Sky Aviation Leasing International in June. In August, Japanese financial

Financing Need Global Commercial Jet Deliveries (US$ B)

Source : Boeing Capital Corp.



services group Orix agreed to pay ¥250 billion ($2.2 billion) to buy 30% of Avolon's outstanding voting share from China's HNA Group, probably a result of financial challenges faced by this Chinese group. GECAS eventually survived the restructuring of GE's financial products activities this year, but it was rumored that SMBC had been interested in the $25 billion GECAS portfolio sales. The growth ambition of SMBC was evident when its shareholders announced plans to pump $1 billion into the company by 2019.

It seems unlikely that lessor consolidation will continue through the kind of large-scale deals that the industry has witnessed during the past few years, unless a change in market conditions presents new opportunities. An interesting case is the development of the Chinese leasing business. There are probably more than 100 Chinese operating lessors but maybe only 15 that have gained sufficient momentum to make an impact in the market. That leaves another 85 companies, sometimes with strong backing, which need to find their place, which seems only possible via future M&A deals. On the other hand, the Chinese government's latest policy to curb capital outflow puts restrictions on large transactions.

The sale and leaseback market remains very active and is dominated by the more commodity-type single-aisle aircraft. Smaller Chinese and Asia-Pacific-based lessors, many of them new participants, are becoming serious investors in new aircraft sale and leaseback deals in what many participants see as an already overheating market. The new entrant lessors have been criticised for driving down lease-rate factors, particularly in the sale and leaseback market in recent years as they build market share seemingly at any cost. Nevertheless, there are some companies where low levels of return may make sense because of their low cost of funds. Some of the (implicit) residual value assumptions seem to be very aggressive and it remains to be seen if all investors realise their expected returns. If and when the industry enters a downturn, this could result in big problems, especially for those new entrant leasing companies with little experience of a stressed market environment and without their own remarketing organisation.

Fund managers are investing more and more in the aviation sector, specifically aircraft leasing, because of the relatively low default rate and stable returns in an otherwise low-yield environment. More private equity funds, hedge funds, sovereign wealth funds are evaluating investment opportunities in the aviation sector. For example, Singapore sovereign wealth fund GIC purchased a 30% interest in aircraft leasing giant BBAM in late 2017. Meanwhile, China- and Japan-based lessors are emerging as key drivers of the global aviation finance market.

The banking market remains open for lessors and the majority of deals are in the structured space, rather than traditional balance sheet financing, which with Basel IV puts more regulatory pressure in the next few years. New entrants, with balance sheet capacity, mainly from Asia, drive liquidity for commercial bank financing products.

Lessors are certainly taking advantage of the robust capital markets for funding aircraft as more companies seek to access unsecured funds to provide easier aircraft

	Manager	Total In Service	Total In Storage	Stored as %	Total On Order	Average Age	Total Operators
1	GECAS	1107	121	9.9%	389	13.2	229
2	AerCap	1003	38	3.7%	397	10.8	214
3	Avolon	554	3	0.5%	309	7.3	165
4	BBAM LLC	448	7	1.5%	0	7.4	111
5	SMBC Aviation Capital	423	3	0.7%	202	6	130
6	Nordic Aviation Capital	374	66	15.0%	51	7.9	76
7	DAE Capital	349	11	3.1%	4	7.9	114
8	BOC Aviation	326	4	1.2%	181	4.1	102
9	ICBC Leasing	324	0	0.0%	130	4	78
10	Air Lease Corporation	317	1	0.3%	362	5.7	114
11	Aviation Capital Group	274	1	0.4%	155	8.7	104
12	Aircastle Limited	241	0	0.0%	25	11.2	94
13	ORIX Aviation	236	0	0.0%	0	8.8	71
14	Unconfirmed Operating Lessor	219	8	3.5%	0	11.9	112
15	CDB Aviation Lease Finance	206	5	2.4%	205	5.1	62
16	Macquarie AirFinance	199	2	1.0%	60	10.3	99
17	Apollo Aviation Group	195	3	1.5%	0	16.5	99
18	Boeing Capital Corp	184	17	8.5%	97	17.4	32
19	BoCom Leasing	178	0	0.0%	30	4.1	49
20	Castlelake	165	7	4.1%	0	16.7	64
21	Jackson Square Aviation	152	2	1.3%	30	4.1	55
22	Standard Chartered Aviation Finance	132	4	2.9%	0	5.1	41
23	China Aircraft Leasing Limited	116	1	0.9%	207	4.1	36
24	Goshawk	107	1	0.9%	40	4.2	45
25	Deucalion Aviation Funds	100	2	2.0%	0	13.4	60
Top 25		7929	307	3.7%	2874		
Others		3232	673	17.2%	608		

Source: Flight Fleets Analyzer

transitions. Equally, more mid-life lessors have tapped the secured markets – notably the asset-backed securities (ABS) market – both as a refinancing tool and to facilitate portfolio sales.

According to credit rating agency KBRA, 2017 was a record year for aircraft ABS issuance, with 12 transactions totalling more than $6.5 billion completed. Aircraft lessors which issued aircraft ABS paper during the past years used securitisation as a means either to finance a portion of their aircraft fleet or to sell aircraft in order to manage portfolio concentrations. After an eventful 2017 of ABS issuance, KBRA anticipates 2018 will continue at a similar pace. It expects to see repeat issuances by certain sponsors and also new issuances by several issuers to enter the market. Lessors will continue to tap the capital markets in ever-greater numbers, so long as they remain open and an efficient source of debt financing.

Sources of equity capital remains a challenge but within that market too there are deep pools of capital from Asian investors, although there are signs that this market is cooling a little and may present more challenges in the future. The demand for funding is rising steadily as the new-technology aircraft are delivered, which drives the constant search for new capital sources. Lessors are also at the forefront of financial innovation. Intrepid has taken advantage of the new insurance-guaranteed product offering by Marsh's AFIC. China International Aviation Leasing Services is raising funds using crowd funding in China as a source of equity.

So, commercial banks have to compete against a wider and deeper group of alternative funding sources, with the emphasis on Asia.

Within the commercial banking world things are changing as well. Decades ago, when aircraft financing was still in its infancy, big US banks dominated the market. Later the centre of gravity moved to Europe, and then Japan. According to Boeing Capital estimates, China will be the major source of bank debt for commercial aircraft deliveries in 2018 with 28% of the market. Japan will still be a respectable second (17%),

	Manager - lessor	Total Indicative Fleet Value (US$ billion)	Average Value per Aircraft (US$ million)
1	AerCap	$30.72	$29.51
2	GECAS	$22.72	$18.50
3	BBAM LLC	$19.18	$42.16
4	Avolon	$17.37	$31.19
5	SMBC Aviation Capital	$15.23	$35.75
6	BOC Aviation	$13.65	$41.39
7	Air Lease Corporation	$13.43	$42.25
8	ICBC Leasing	$12.80	$39.64
9	DAE Capital	$10.28	$28.57
10	Aviation Capital Group	$7.20	$26.18
11	CDB Aviation Lease Finance	$6.80	$32.27
12	BoCom Leasing	$6.71	$37.73
13	ORIX Aviation	$6.21	$26.32
14	Jackson Square Aviation	$5.96	$38.71
15	Nordic Aviation Capital	$5.80	$13.20
16	Unconfirmed Operating Lessor	$5.59	$24.74
17	Aircastle Limited	$5.30	$22.00
18	Amedeo	$5.00	$104.25
19	Standard Chartered Aviation Finance	$4.47	$32.87
20	Macquarie AirFinance	$4.34	$21.62
21	Goshawk	$3.90	$36.19
22	China Aircraft Leasing Limited	$3.86	$33.04
23	Arctic Aviation Asset Ltd	$3.48	$44.63
24	International Airfinance Corporation	$2.92	$57.31
25	CMB Financial Leasing	$2.71	$39.39
26	ALM - Aircraft Leasing & Management	$2.68	$33.18
27	Apollo Aviation Group	$2.63	$13.32
28	Doric	$2.55	$65.63
29	CCB Financial Leasing	$2.54	$38.56
30	ALAFCO Aviation Lease and Finance Company	$2.25	$36.41
31	Altavair	$2.20	$44.04
32	MCAP/MC Aviation Partners	$2.07	$30.01
33	SKY Leasing	$1.98	$25.17
34	Accipiter	$1.94	$28.98
35	Castlelake	$1.93	$11.22
36	Deucalion Aviation Funds	$1.87	$18.39
37	Tokyo Century Corporation	$1.87	$35.29
38	VEB-Leasing	$1.78	$27.89
39	VTB-Leasing	$1.72	$24.35
40	GTLK - State Transport Leasing Company	$1.72	$23.34
41	Boeing Capital Corp	$1.69	$8.45
42	FPG Amentum	$1.57	$31.45
43	GOAL German Operating Aircraft Leasing	$1.49	$25.28
44	Novus Aviation	$1.43	$79.53
45	Banc of America Leasing Ireland	$1.38	$47.67
46	SPDB Financial Leasing	$1.31	$41.09
47	Changjiang Leasing Company	$1.25	$19.27
48	Sberbank Leasing	$1.20	$20.04
49	Titan Aviation Leasing	$1.19	$42.53
50	AVIC International Leasing	$1.13	$23.22

Source: Flight Fleets Analyzer

followed by Germany (16%). France (9%), Australia (8%), the US (7%), the UK (5%) and others (10%) will take care of the remaining demand for debt.

Outlook

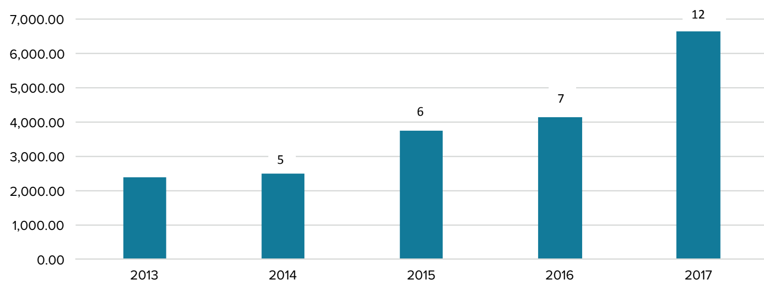
So, with all of the above in mind, can we now answer this simple question: where are we in the cycle? Like previous years, this remains difficult. Industry observers and consultants for a number of years have proclaimed that the "bubble is about to burst". Well, if it is a bubble we are living in, it seems to be made of shatterproof glass. Over the past years neither political unrest, nor (the threat of) wars, nationalism, terrorism nor the increasing fuel price have been able to make the bubble burst. Air traffic continues to grow at above-average levels, air cargo has recovered and is now stabilising, aircraft ordering has continued and airlines are generating near record levels of profitability, and investors and financiers are throwing billions and billions of dollars at the commercial aviation business.

Obviously some niche markets are less fortunate. Individual airlines are still failing, others are not even capable of generating decent profits under the current circumstances and still others are already warning that their results will start to suffer under the current high fuel prices. In the equipment market, the engine OEMs are upsetting their customers with what seems like an unprecedented wave of technical glitches and production problems. In the regional aircraft market and also in the twin-aisle jet market, some of the newly launched types have failed to find enough interest. Some of the existing types are struggling to fill the remaining open production slots and, in some, sad, cases, relatively young aircraft are not welcome anymore in the global skies and are awaiting an inglorious end in the desert until the scrap hammer puts them out of their misery.

In the single-aisle market, the A320neo has entered service and so has the 737 Max. Engine glitches and production delays, however, put a damper on airlines' enthusiasm for these fuel-saving derivatives. Looking east, the Russian MS21 and Chinese C919 will also take a few years before service entry but at least both types made their first flights.

Aircraft ABS Transactions

Source: KBRA



In the twin-aisle market, the 787 and A350XWB are in service and can be spotted at an increasing number of airports. The A330neo is suffering some delays but will most likely enter service in the coming months. Boeing's 777X is in production, although it will take a bit of time before the first customers can take delivery, even if the test flights go according to plan.

In the super heavy category, is seems the relatively young 747-8 and A380 are already past their prime and both face an uncertain future. While the 747-8 has a fall-back position in the air cargo market, the A380 can only rely on less than a handful of loyal fans who keep the production line going, which does not take away that used aircraft are difficult to place at acceptable conditions. In the regional jet market, Airbus and Boeing seem to be taking over and life for the few independent OEM's is not getting easier.

Overall, it can be concluded that we are past the halfway stage of the generation change, or, halfway through the technology cycle. The flipside of all the new aircraft introductions obviously is the fact that older-generation aircraft will reach the last-of-the-line stage soon. Based on historical experience, this group of late-production aircraft should lose value much faster compared with early- and mid-production aircraft of the same type. However, analysts that were preaching doom and gloom about these last-of-the-line aircraft so far have definitely not been proven right.

There are three elements that have upset the theory. First, demand for air travel is still growing at a solid pace and the normal cyclical downturn has not materialised. Second, modest fuel prices extend the viability of these – relatively less-efficient – aircraft for the time being. Third, low inflation should result in modest delivery price increases as the result of contractual escalation clauses. Although the cost index for the labour element is still increasing, material costs show negative index developments. Logically, delivery prices for last-of-the-line aircraft should not increase as fast as originally feared.

Finally, the supply of new aircraft did not increase at the pace everybody was expecting. Airlines that were counting on a significant number of new-technology aircraft suddenly had to look for older aircraft to maintain their schedules and consequently the replacement wave was postponed.

So, what could bring the supercycle to an end? Much to the frustration of many analysts, there are very few signs something like this will happen (famous last words?). Similar to a murder-mystery game, let us look at a few of the potential (hypothetical) killers of the supercycle.

Stagnant or negative demand growth

- significant increase in ticket prices: this could be caused by – most likely – strong increases in fuel prices, either because of a rise in the cost of crude oil or because of increased tax levels, which is probably one of the real threats. Operators of less fuel-efficient aircraft especially could come under pressure;
- drop in purchasing power: assuming

the world population will continue to grow, only a strong reduction in purchasing power could see demand for air travel fall away. Obviously, this would mean a 180-degree turnaround from the recent trend, where an increasing share of the world population reaches an income level that allows them to upgrade from bus or train travel (or no travel at all) to the aircraft;

- the fear factor: fear of flying could reduce willingness to travel, either because of concerns about safety of air travel, or because of a fear of terrorist actions, natural disasters, diseases, etc. While obviously the latter factors are impossible to predict, statistics show that flying is safer than ever before. It seems that because of frequent acts of terrorism, the public has, generally, become more immune to news about these events;
- regulatory or government-imposed restrictions: for various reasons, including environmental concerns or an expanding trade war, national governments could restrict their citizens in international (air) travel; and
- reasons to fly: alternative communication techniques such as video-conferencing, virtual reality experiences could reduce the need to travel. Alternative, superior transportation modes, such as a hyperloop could also make travellers switch. Some more experienced travellers complain that airport congestion and security checks are taking away the fun of travel. Long queues at major tourist destinations also reduce the enjoyment.

Airline profitability

- cost increases: if these cannot be passed on to the travelling public they obviously are a major threat to airline profitability and consequently economic viability. Fuel prices clearly are a cause for concern but also so is increasing labour costs (or reduced labour productivity because of strike actions). In addition, history has shown that when companies reach levels of increased profitability, other stakeholders, and in particular the national governments, are ready to increase taxes, usually pretending this is for the good of the nation or the environment;
- yield pressure: while low fuel cost (and high load factors) allowed airlines to lower ticket prices (and hence stimulate demand) in certain price-sensitive and/or highly competitive markets the reverse may be impossible. With the expansion of the LCC model from short and medium haul to long haul, the competition among airlines may well intensify. A new-technology aircraft such as the 787 seems to have opened an opportunity for LCCs to expand to, for example, transatlantic operations. While it is too early to tell, the introduction of long-haul single-aisles, such as the A321neo LR could intensify competition even more, while the introduction of the Boeing's much-debated 797 NMA could offer the airlines another instrument for aggressive expansion; and
- demand/supply equilibrium: currently airlines enjoy spectacular high load factors thanks to relatively modest capacity expansion. Should this change and aircraft overcapacity drives load factors down, this could impact both airline profitability and aircraft values and lease rates. Production restrictions so far have prevented this from happening, but should the plans of Airbus and Boeing to increase production of the A320 family and the 737 respectively become reality, with the Chinese C919 and Russian MS21 entering the market a few years later, an oversupply could easily materialise. Given the increasing political tension and the expanding trade war between the US and China, a scenario under which China and/or Russia would be able to rely on their local designs could spell problems for the western manufacturers.

Aircraft values

Most of the hypothetical scenarios sketched above will have a negative impact on the equipment market and consequently aircraft values and lease rates.

The current circumstances may have postponed the impact of the normal generation change on aircraft liquidity and values. It is unclear if – once production of the Neo and Max gain momentum, the industry will see milder, normal or more severe deterioration in the value of older-generation aircraft. In the twin-aisle market, it seems that certain types suffer significant value adjustments, while the impact on others is minimal. The same goes for regional aircraft, where E170s and E190s, for instance, are under increasing pressure, while demand for the (scope optimised) E175 remains very high. Given the fleet demographics of the E175, some observers are worried that, should scope clauses change, this type could see a scenario similar to that of the CRJ200 and ERJ family.

While the decisions justifying the injection into the aviation industry of billions or dollars from North American pension funds and private equity firms, as well as Asian investors, are taken by smart people, somehow this gives many observers an uneasy feeling. Historic examples that spring to mind include Tulip Mania in the mid-1600s, the dotcom bubble in the late 1990s, the sub-prime mortgage crisis of 2007 and the crisis in the shipping business after a synchronised boom that ended in 2008. While near term, there are very few signs of an aviation crisis, the adage "the higher they climb, the harder they fall" has to be kept in mind.

Our summary effectively can be the same as last year: "The industry continues to hover at great heights and there are hardly any real indicators of an imminent crash. Traffic growth is very robust, fuel remains modest, financing is plentiful and cheap and most airlines are profitable."

For the time being, and to answer last year's question, whatever happens in the near or distant future, there are enough arguments to support the statement that the commercial aviation business has for some years been in – and still is – an unprecedented supercycle. But riding a cycle also demands a continuous watchful eye on the other traffic. A supercrash could be just around the corner.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Untangling the growing web of aircraft transactions and values

There are many factors that influence aircraft values, but these factors can be complex, says boutique advisory firm Alton Aviation Consultancy.

All along the aviation value chain, a wide range of participants is revelling in the sustained favourable market conditions. This year is expected to bring a record ninth consecutive year of airline profits, and additional new investor interest in aircraft as an asset class.

As manufacturers churn out aircraft at record rates, airlines and lessors are buying and selling aircraft among and between each other in increasing numbers to curate what they perceive to be their optimal portfolios.

In the secondary markets, the normal transaction has evolved; singleton trades of aircraft on a standalone basis are few and far between. With the increased proliferation of aircraft operating leasing, the majority of aircraft transactions – on a unit and value basis – now involve attached leases.

The increasingly complex web of transaction types and the decreasing occurrence of single-aircraft pure metal trades, as well as confidentiality and opaqueness in transaction prices, mean market value is an increasingly elusive concept.

For different market participants, even the purpose of the valuation and intended use of the resulting figures may differ.

For an airline, an accurate valuation might be most pertinent for insight into residual value risk or for insurance purposes; for an investor, the income-generating ability of the asset – the stream of cash flows that can be expected, and with what risk, is paramount to values.

Over the years, aircraft valuation practices have been primarily focused on metal values but as the market has evolved, because few transactions are straightforward metal single-asset trades, there may be an increasing disconnect between these outright values and the real world.

This trend of increased trading of assets with attached leases is expected to grow given the increasing proportion of the global fleet financed by lessors, now exceeding 40%. Therefore, published blue book values are not sufficient for valuing most types of transactions. Another layer needs to be added; the value associated with future income as determined by the lease.

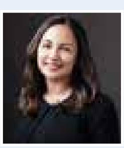
It is time that valuation practices kept pace with the growing and evolving aircraft transaction market. If more investment and new investors are to continue to be attracted to the market and participate in a well-informed capacity, then investors need to understand not only the appraised dollar value of the physical asset, but also the upside and downside risk of their investments. This involves logical but rigorous methodology; a wholistic approach that is the norm will make for more

About Alton Aviation Consultancy

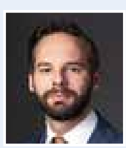
Alton Aviation Consultancy is a boutique advisory firm dedicated to serving the aviation and aerospace industries.

Our engagements span the aviation and aerospace value chain to include commercial, financial and technical aspects – from strategy and business plan development to operational improvement and implementation support. Clients include airlines, original equipment manufacturers (OEMs), maintenance, repair and overhaul and other service providers, lessors, lenders, and the broader financial and investment community.

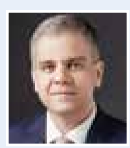
Founded by seasoned aviation industry executives and consultants, Alton's team is globally recognised for thought leadership, quantitative analytics and innovative solution development. Alton's professionals highly value personal relationships and continuously strive to deliver individual attention and white-glove client service.



Laetitia Achille
managing director



Enda Clarke
managing director



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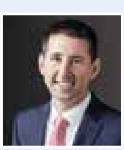

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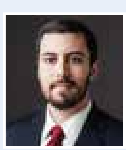
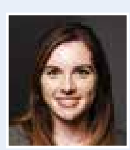


Adam Guthorn
director



Isobel Fenton
senior associate

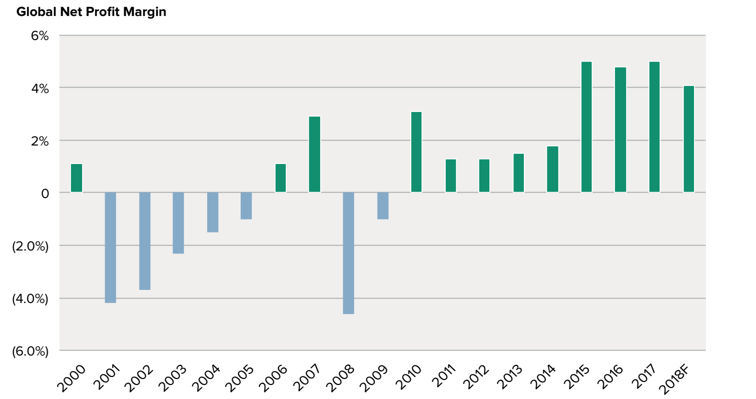
informed investors. Discussion on and understanding of lease encumbered valuations need to become as prevalent in the market as lease trades.

This multi-part paper provides:

1. An overall assessment of the industry;
2. Analyses observed trends in aircraft transactions over the past decade; and
3. Offers perspective to investors as they consider how to best ascribe value to today's transactions.

Exhibit 1. Global airline net profit margins, 2000-2018F

Source: Alton Aviation Consultancy analysis; Airlines for America; Iata industry statistics June 2018



Part 1: The air transport and leasing industries have enjoyed favourable dynamics

Recent airline profitability contrasts with historical trends.

Many industry participants question whether the renaissance of airline profitability has arrived: has there been a structural change in the industry that has formed a more stable foundation or are we just enjoying an above-average peak in the cycle?

The optimists include those that may have a vested interest in believing the former, such as airlines and enthusiastic airline industry groups; the International Air Transport Association (Iata) director-general and chief executive officer declared: "Airlines are defining a new epoch in industry profitability". But not everyone is singing the same tune; some are pointing to signs that the peak has passed, noting that, while still strong, 2018 profits are forecasted to be lower than the preceding three years.

While air traffic growth over the years has more than kept pace with economic growth, there has not always been such a correlation between economic growth and airline profitability. However, the challenging market conditions during and after the 2007-08 financial crisis forced airline discipline in mature markets, particularly in terms of capacity growth and cost management. Many weak airlines undertook restructuring, while others consolidated to make a stronger combined entity, better prepared for future turbulence. Continued replacement of older aircraft with younger, more fuel-efficient aircraft assisted airlines in managing through periods of volatile and elevated fuel prices.

Strong air traffic demand growth has been driven by sustained expansion of global economic activity and an increasing propensity to travel of the growing middle class, particularly in emerging markets.

Additionally, low-cost carriers (LCCs) have proliferated; enabled by their lower cost base to lure passengers with lower fares than full-service competitors. LCCs have stimulated new demand and driven down fares in the markets in which they operate.

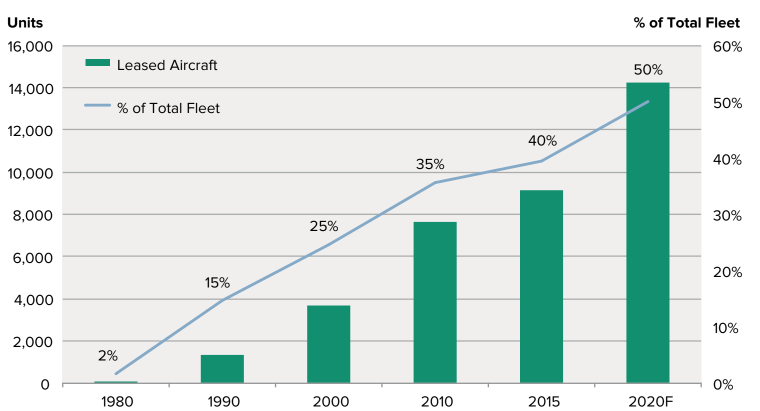
Leasing is booming, with appeal to both lessors and lessees

Aircraft leasing has evolved over the past decades from virtually non-existent in the 1970s, to gaining traction through the 1990s and accelerating through the 2000s. Today, aircraft leasing accounts for about 40% of the commercial aircraft fleet. Leasing is a major source of financing for aircraft; lessors are likely to finance some 35% to 45% of the current order backlog, including expected sale and leasebacks at delivery.

Leasing appeals to airline lessees and lessors with attractive but differing characteristics on both sides. For the airline lessee, the off-balance-sheet proposition of an operating lease frees up capital while keeping leverage down and alleviates aircraft residual value risk. It also allows flexibility in aircraft acquisition timing and capacity management, enabling trial of new aircraft and routes with lower commitment.

Exhibit 2. Changes in leased fleet as a proportion of total fleet over time

Source: Iata



Lessors, on the other hand, enjoy a margin between the cost of capital and the returns achieved through leasing, along with tax benefits. Bulk purchasing helps the largest lessors enjoy favourable pricing from OEMs while superior creditworthiness (frequently as a result of affiliation with large, stable financial institutions) provides large and established lessors with low financing costs. A mobile asset with a global customer base and often-large contractual future cash flows when a lease is attached makes aircraft an appealing investment.

Lessors pursue different strategies with their portfolio profiles. Some specialise in new or young aircraft, others in mid-life while some smaller lessors deal in niche categories, focusing on placing aircraft that are older, less liquid, or in less-active geographical markets.

Exhibit 3. Top 10 global lessors by estimated portfolio value, 2017

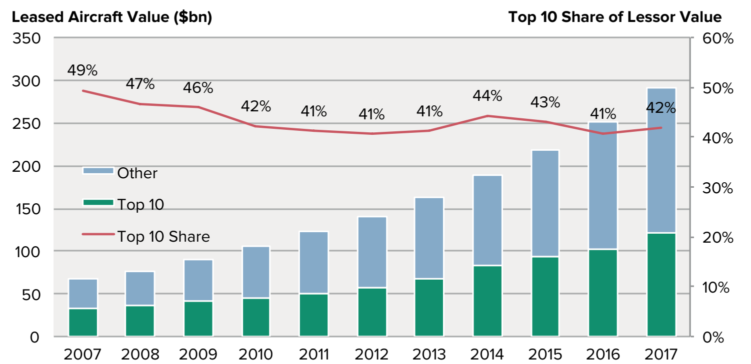
Source: Alton Aviation Consultancy analysis; *Airfinance Journal* Leasing Top 50, November 2017

	Lessor	Headquarters Country	Owner Country	Estimated Portfolio Value ($ billion)	Fleet Size
1	AerCap	Ireland	USA	$35.1	1,121
2	GECAS	USA, Ireland	USA	$28.3	1,271
3	Avolon	Ireland	China	$21.3	572
4	BBAM	USA	Multiple	$19.8	404
5	SMBC Aviation Capital	Ireland	Japan	$17.4	437
6	BOC Aviation	Singapore	China	$13.9	299
7	Air Lease Corporation	USA	USA	$13.8	278
8	ICBC Leasing	China	China	$11.8	250
9	DAE Capital	UAE, Ireland	UAE	$11.7	334
10	Aviation Capital Group	USA	USA	$8.5	274

Exhibit 4.Top 10 versus other lessor fleet portfolio values

Note: unless otherwise cited, fleet analysis is based on CAPA database.

Source: Alton Aviation Consultancy analysis



Scale of the largest lessors increases, but concentration does not

Within the leasing industry, some behemoths dominate. The two largest – AerCap and GECAS – are leagues ahead of their closest rivals, with fleets more than double that of the third-place holder, Avolon.

Lessors in Asia, particularly China, are relatively new capital providers to the leasing industry. Relaxed regulations a decade ago by the China Banking Regulatory Commission cleared the path and China's top banks promptly started developing their capabilities and formed dedicated aircraft-leasing divisions. They enjoy low cost of capital, increasingly so with size.

Top lessors are enjoying economies of scale and borrowing power to achieve wide margins on very large investments. According to *Airfinance Journal*, the average cost of debt for some of the leading lessors has been about 4% to 4.5% in the past few years, while some have achieved rates as low as 2.5% to 3%. Return on equity achieved by the top lessors has been in the range of 9.5% to 10% over the past three years.

Many of the largest lessors have achieved such scale through aggressive acquisition on top of organic growth – AerCap's acquisition of ILFC completed in 2014 remains the largest in the industry, and was followed by Avolon's acquisition of CIT Aerospace and DAE's acquisition of AWAS.

Despite the significant consolidation that has taken place, the overall share of the 10 largest lessors as a percentage of the total leased fleet is not meaningfully different today than it was five year ago.

More players have been attracted to the space, enabled by high liquidity and low interest rates and encouraged by the attractive returns the market leaders have achieved. They are comforted by the backing of an underlying hard asset and returns that have historically outperformed many other asset classes and demonstrated low volatility as well as low correlation to broader market indices. Aircraft liquidity has generally been viewed as positive for the most common aircraft types.

Part 2: Aircraft trading activity has grown in most market segments

While OEMs are sellers and specialist part-out companies are buyers in the market, airlines and lessors (and equity investors behind lessors) are both buyers and sellers. A web of primary, secondary and tertiary aircraft transactions take place between these market participants:

- primary transactions are those involving new aircraft sales direct from the OEMs to airlines and lessors;
- secondary transactions, between airlines and lessors, are those involving not only direct sales between the parties, but also sale and leasebacks between airlines and lessors (both new and used


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Exhibit 5. Aircraft transaction ecosystem

Source: Alton Aviation Consultancy

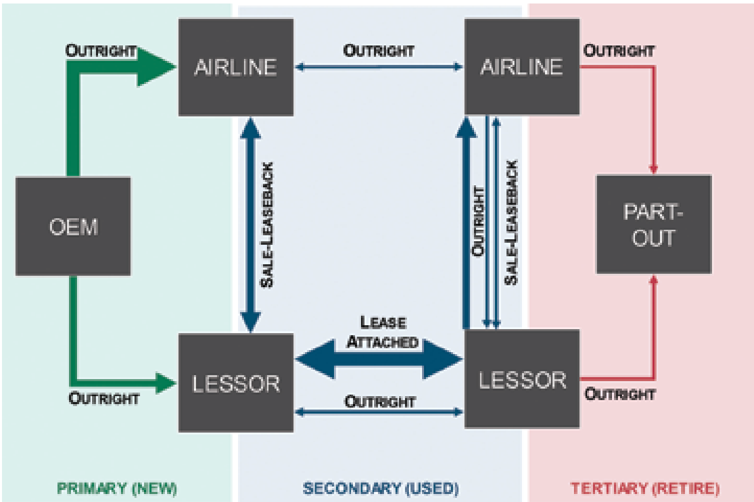


Exhibit 6. Aircraft transactions by market segment by aircraft value

Source: Alton Aviation Consultancy analysis

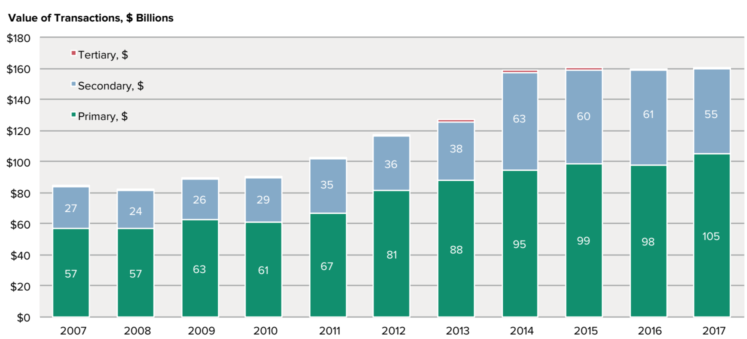
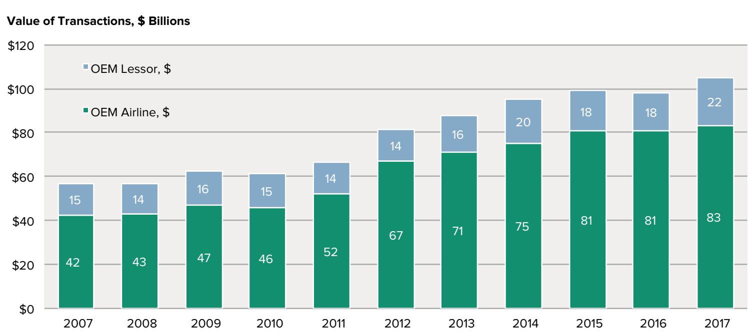


Exhibit 7. Primary market aircraft transactions by aircraft value

Source: Alton Aviation Consultancy analysis



aircraft) and sales with leases attached between lessors; and

- tertiary transactions typically involve airlines and lessors selling to specialised part-out companies at the end of an aircraft's life.

Overall transaction volumes have more than doubled over the past decade, amounting to more than $160 billion annually in the past few years, up from $84 billion in 2007.

Primary market transactions have expanded with industry growth.

In the primary market, the vast majority of the new aircraft sales by OEMs is directly to airlines, accounting for about 80% of the volume. Direct sales to aircraft lessors account for the remaining 20% of total delivery volume.

OEM sales to airlines

The most common aircraft sale and purchase transactions is directly between the manufacturer and the end user, the airline. While airlines of all types do acquire aircraft from the OEMs, those that purchase aircraft have a tendency to be larger, well-capitalised airlines which primarily intend to keep aircraft for the duration of the economic life, or airlines with strong growth aspirations or fleet-replacement requirements, requiring the certainty of securing aircraft capacity that comes from a larger orderbook. With increasing growth rates in terms of volume and value, OEM deliveries to airlines reached 1,298 units at a total value of $83.4 billion in 2017.

OEMs have enjoyed a non-concentrated airline customer base, with the largest 10 airline customers accounting for just 30% of total airline delivery value over the past 10 years, led by Emirates Airline, American Airlines and China Eastern Airlines.

OEM sales to lessors

While OEM direct sales to airlines have nearly doubled, direct sales to lessors have grown significantly as well over the past decade. In 2017, direct deliveries to lessors accounted for a volume of 401 aircraft at a value of $21.7 billion, an increase of more than 50% compared with a decade earlier, as measured by value.

The lessor customer base has been significantly more concentrated than that of the airlines, with the largest 10 lessor customers accounting for more than 70% of total lessor delivery value for the OEMs, led by AerCap, GECAS and BOC Aviation.

The still substantial but lower growth rates in sales to lessors may be attributed to dynamics at both the OEMs and lessors. While recognising the value brought by lessors to the market, OEMs have sought to manage the volume of the aircraft orderbook held by lessors so as to maintain aircraft availability for its end-user airline customers. OEMs have recognised the value in maintaining direct relationships with their end users, not only for the manufacturer-customer relationship aspect but also to manage pricing across the totality of their orderbook, since large lessors can enjoy particularly strong bargaining power and place speculative orders in bulk volumes.

For their part, savvy lessors, well aware of the transition underway in the OEM production from current-generation to next-generation aircraft, have had some hesitancy in acquiring the last-off-the-line models delivering in the past few years. Airlines with long anticipated hold periods for the aircraft have been less concerned, particularly when offered attractive pricing.

Secondary trading has increased significantly in the past few years

OEMs deliver new aircraft to airlines but have limited direct participation in the secondary market, where the airlines and lessors transact among themselves. In this secondary market, the vast majority of transactions involve lessors and come with attached leases – ranging from sale and leasebacks and portfolio sales to mergers and acquisitions.

Among these secondary transactions, the vast majority of trades have been with a related lease agreement.

Airline and lessor sale and leasebacks

New/young aircraft

The volumes of new/young sale and leasebacks have accelerated significantly since 2013, amounting

Exhibit 8. Distribution of OEM deliveries to airlines, by aircraft value, past 10 years

Note: includes new deliveries to acquired companies.

Source: Alton Aviation Consultancy analysis

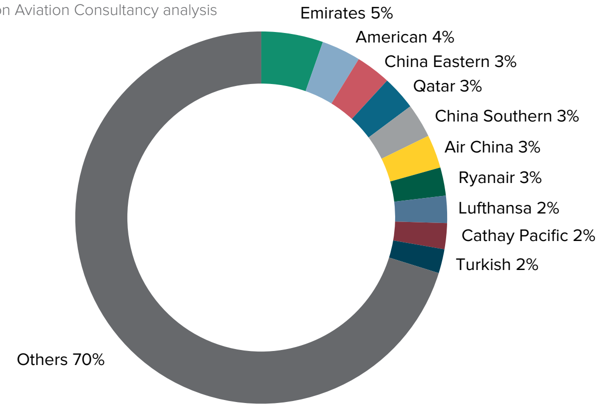


Exhibit 9. Distribution of OEM deliveries to lessors, by aircraft value, past 10 years

Note: includes new deliveries to acquired companies.

Source: Alton Aviation Consultancy analysis

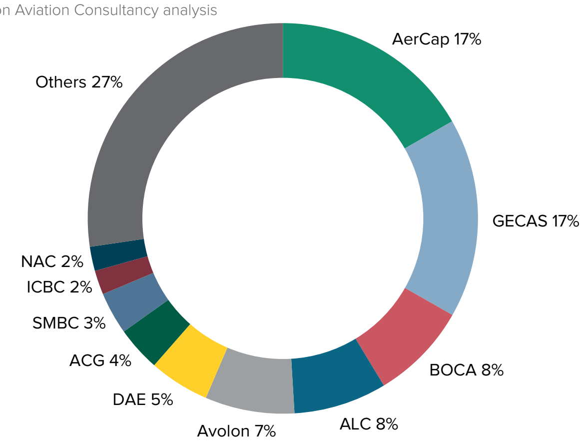


Exhibit 10. Secondary market transactions by aircraft value

Source: Alton Aviation Consultancy analysis

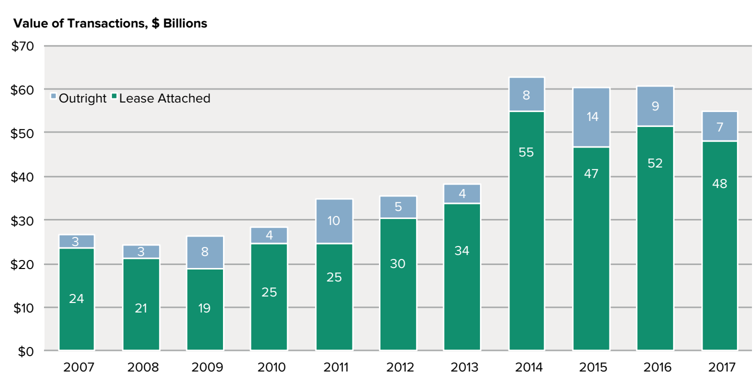
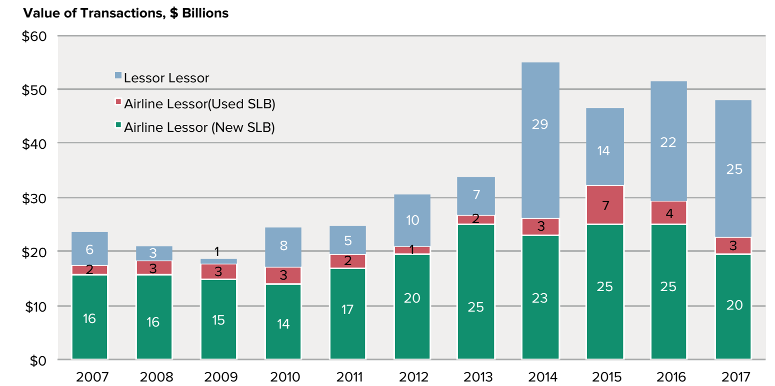


Exhibit 11. Secondary market lease attached transactions by aircraft value

Source: Alton Aviation Consultancy analysis



to 295 aircraft valued at nearly $20 billion in 2017. They have become an increasingly popular means for airlines to finance their fleet acquisitions. For large airlines with strong bargaining power, significant gains on the purchase price can be made through sale and leasebacks while using the transaction as a method of financing, releasing equity and removing the asset from the airline's balance sheet.

Sale and leasebacks free liquidity for an airline's operational needs so sale-and-leaseback activity can be seen to rise in cyclical downturns or invoked by individual airlines suffering challenging conditions and tight liquidity. The transactions have been attractive to lessors also given the predetermined customer and terms, compared with the speculative risk of an unplaced orderbook.

Used aircraft

Sale and leasebacks are primarily undertaken for new or young aircraft. Of the transaction types examined, the volume of used aircraft sale and leasebacks has shown the most volatility over the past decade, albeit off a relatively low baseline. In 2017, these transactions totalled 65 aircraft at a value of $3.2 billion.

The sale and leasebacks of a used or older aircraft is complex and unique. It is not only a function of the aircraft's age but also of its condition and the negotiated lease terms, such as maintenance reserves. These transactions are primarily undertaken by airlines wishing to manage their residual value risk or fleet capacity.

The well-publicised transaction between Easyjet and Aircastle for 10 Airbus A319s (about 12 years average age) in a rolling sale-and-leaseback plan as an exit strategy for the fleet is representative of these types of transactions.

Lessor-to-lessor lease-attached transactions

Sales between lessors have seen the most notable growth in recent years, a reflection of increased liquidity, trading and also merger and acquisition activity. In 2017, 844 aircraft with leases attached, valued at $25.1 billion, were sold between lessors.

Those sales occur often as a result of lessors' portfolio strategies. Lessors will sell aircraft as a means of rebalancing their portfolio to increase or decrease exposure to a certain credit or aircraft type, to manage their fleet age, as well as to demonstrate the appropriateness of their depreciation policies. SMBC Aviation Capital, in adhering to its young, modern fleet strategy, sold a 20-narrowbody aircraft portfolio to Aircastle in 2017 as the aircraft passed a target age threshold. Aircastle sought value from diversifying its fleet mix, particularly with the geographical diversity of 13 of those aircraft and their leases in place.

Some lessors have raised dedicated funds to focus on aircraft-leasing opportunities, frequently acquiring assets from a range of other lessors, and then efficiently financing them through asset-backed securitisation vehicles. Apollo Aviation Group, which specialises in mid-life, in-production aircraft, acquired 59 aircraft in 2017 from other lessors such as AerCap, Orix Aviation and Incline Aircraft Holding – all with leases attached – for a gross purchase price of $965 million.

Year-to-year fluctuations in overall trading are principally the result of the timing of large portfolio transactions. There was a spike in activity in 2014 as a result of AerCap's acquisition of ILFC while, in 2016, Avolon's acquisition of CIT drove higher volumes, followed by DAE's acquisition of AWAS in 2017.

Exhibit 12. Secondary market outright transactions by aircraft value

Source: Alton Aviation Consultancy analysis

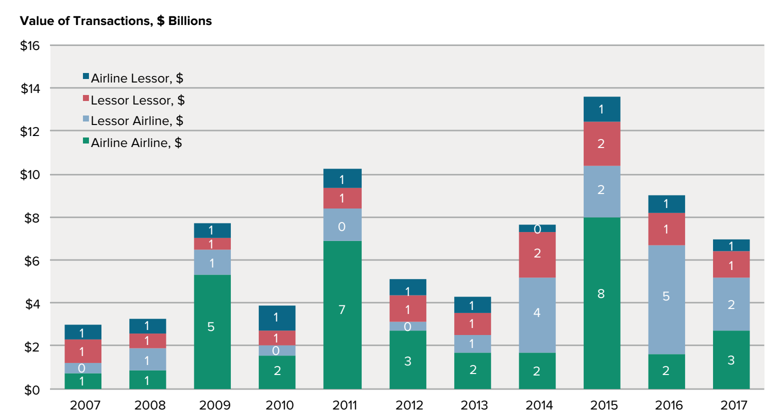
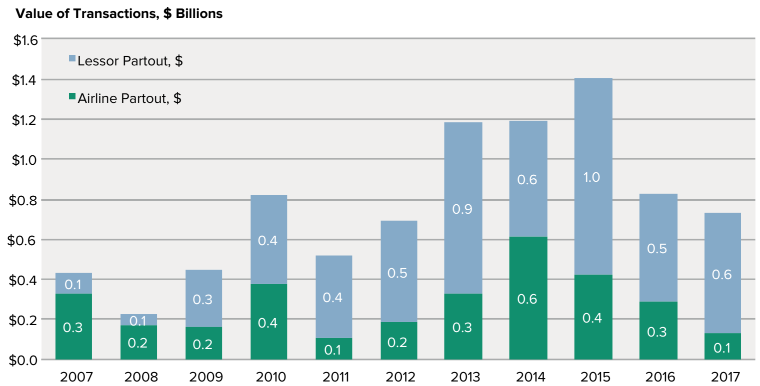


Exhibit 13. Tertiary market aircraft transactions by aircraft value

Source: Alton Aviation Consultancy analysis



Few outright transactions in secondary market

The volume of aircraft transactions in the secondary market sold on an outright basis is substantially lower than those sold with leases attached. These transactions involve airlines and lessors acting as buyers and sellers, with no particularly type of transaction dominating.

Airline-to-airline transactions

Transaction volumes between airlines are volatile and seemingly uncorrelated to the industry cycle, with significant bumps coming in years where large mergers and acquisitions have closed. In 2017, just 225 such transactions were recorded, at a value of only $2.7 billion, with a low average value indicative of the older age profile of the aircraft involved.

Airlines may wish to offload a certain aircraft or model not aligned with future fleet and network plans. In many instances, aircraft flown by carriers in developed markets have a preference for younger aircraft, and sell to carriers in emerging markets where the aircraft still has significant operational life remaining.

Some airlines have employed this as a primary fleet-acquisition strategy. Until 2016, Allegiant Air exclusively purchased used aircraft (initially ageing McDonnell Douglas MD80s and subsequently Airbus A320s) from other airlines and thereby built its fleet opportunistically as these came on the market. In contrast, Air Berlin's aircraft were sold recently under bankruptcy conditions with speculation that one of the largest purchasers, Lufthansa, achieved favourable pricing on the deal.

Lessor-to-airline outright transactions

Aircraft sales from lessors to airlines have historically been limited, but volumes have increased recently. In 2016, lessors sold 285 aircraft to airlines, at transaction values of about $5 billion but the following year's 194 sales, valued at $2.5 billion, shows the volatility of these transactions.

The rationale for such trades are broad and can include airlines exercising their purchase option as part of Japanese operating leases with call options (Jolcos), as well as airlines and lessors agreeing to lease buy-outs. Moreover, in the environment of strong air traffic demand, low to moderate fuel prices, and sustained financial profitability, carriers such as Delta Air Lines, Southwest Airlines and United Airlines have found used aircraft attractive. As a result, they have acquired used assets from other airlines and lessors.

Lessor-to-lessor outright transactions

While total trading activity between lessors has grown in recent years, the volume of outright sales (without lease attached) have been limited to about $1 billion a year. Many lessors perceive the sale of an aircraft without a lease attached as being a type of distress sale given the uncertainty around the timing of future lease rentals income and the credit of the next lessee.

Airline-to-lessor outright transactions

Secondary market transactions on an outright basis from airlines to lessors are small. In 2017, the 39 aircraft transactions accountant for $545 million.

Lessors may opportunistically purchase older aircraft from airlines when it no longer fits with the airline's fleet strategy and they do not want the residual value exposure. Because of their significant sales and marketing reach, lessors will most frequently acquire these aircraft when they have lined up a downstream lessee, or have a high degree of conviction on their ability to secure attractive lease terms.

Lessor Nordic Aviation Capital purchased 10 ATR72-600s from Azul Linhas Aereas in October 2017, half of which were to exit by the end of that year and the other half in 2018. Azul is in the process of up-gauging to larger next-generation aircraft, while the lessor had plans to remarket the aircraft to new lessees, amid strong demand for the type.

Retirements/part-outs in the tertiary market have declined

A part-out is an end-of life sale in which the usable, saleable parts are extracted from an aircraft. It is conducted when the disassembly will yield more value than the aircraft as a whole. These end-of-life transactions can be conducted in two ways: outright sale, where the aircraft is sold whole (or as whole airframe and whole engines) – it will then be dismantled by the purchasing parts-trading specialist; or by consignment sale, in which the seller maintains ownership of the asset but consigns it to the parts-trading specialist.

Part-out transaction levels vary year to year, driven over the medium term by fleet demographics but, in the short term, aircraft supply-and-demand balance, fuel prices and underlying demand for aircraft components are the drivers. Both airlines and lessors sell aircraft for part-out: in 2017, airlines sold 101 aircraft, valued at almost $128 billion, while lessors sold 174 aircraft at an estimated value of more than $600 million.

Strong growth in this market was observed between 2008 and 2015, but volumes have fallen significantly in the past few years amid a strong aircraft

Most traded Airbus A320-200 (single lessee)

Source: Alton Aviation Consultancy analysis

Years	Status	Operator	Owner	Transaction
1996-1998	On order	N/A	GECAS	Delivered; sold with lease attached
1998-2006	In service	China Eastern	Pegasus Capital Corporation	Sold with lease attached (M&A)
2007-2011	In service	China Eastern	AWAS	Sold with lease attached
2012-2013	In service	China Eastern	Aircastle	Sold with lease attached
2014-2015	In service	China Eastern	Arena Aviation Capital	Sold with lease attached
2015	Retired	N/A	AerFin	Sold

Most traded Boeing 737-800 (multiple lessees)

Source: Alton Aviation Consultancy analysis

Years	Status	Operator	Owner	Transaction
1996-1999	On order	N/A	Itochu Airlease	Delivered; leased
1999-2002	In service	Air Europa	Itochu Airlease	Sold with lease attached
2002-2003	In service	Air Europa	Lombard Global Finance Co	Sold with lease attached (M&A)
2004-2006	In service	Air Europa	SMBC Aviation Capital	Sold with lease attached
2006-2010	In service	Air Europa	Baker & Spice Aviation	Sold with lease attached
2010-2014	In service	Jet2.com	Fly Leasing	Leased; sold with lease attached
2015-present	In service	Jet2.com	Element Financial Corporation	Sold with lease attached

demand environment. While this strong demand has been good for the overall industry, participants in the end-of-life segment have noted challenges sourcing assets at attractive prices.

Part-outs have historically been undertaken at retirement age but there has also been an increasing trend of parting out some younger, mid-life aircraft. In these cases, the demand for parts is high, with their value as parts being greater than the prospect of their continued operation and maintenance expenses in the context of the expected residual value of the aircraft. As an example, CAPA's fleet database reports that AerFin purchased two Boeing 737-800s of about only 17 years old from another lessor, Investec's Global Aircraft Fund, which it then retired and presumably dismantled for their components.

Part 3: Today's trading marketing has significant implications for valuations and investors

Comparable outright aircraft transactions are limited

While the market has grown substantially over the past decade,

Exhibit 14. Average annual primary/secondary transaction volume by unit, 2013-2017

Source: Alton Aviation Consultancy analysis

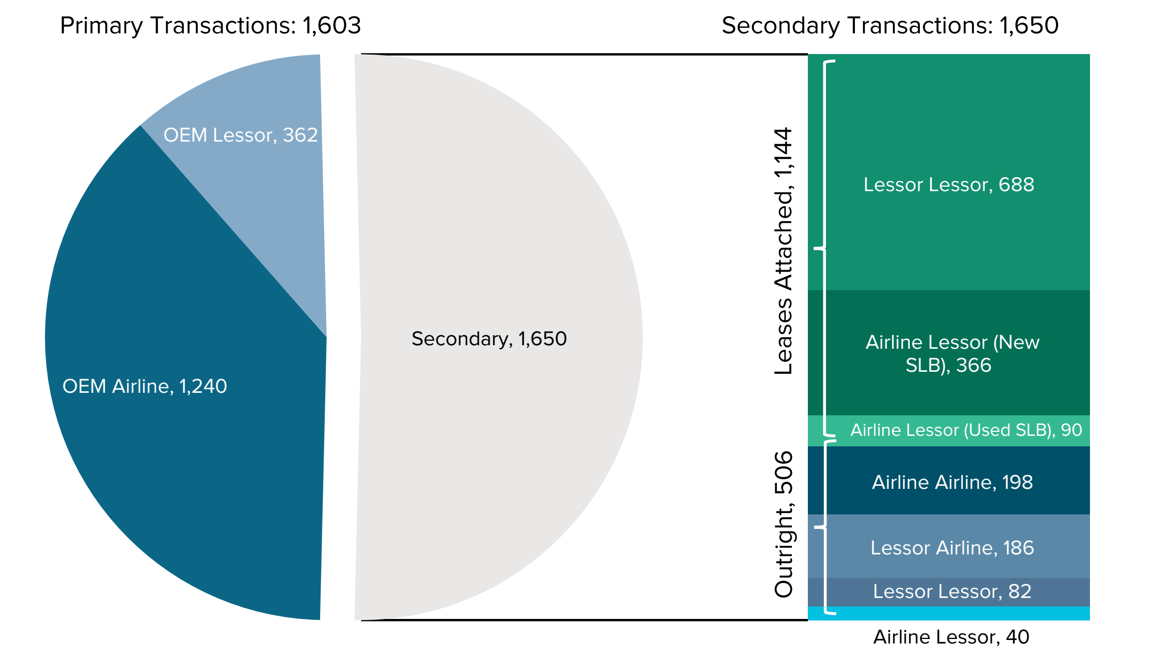
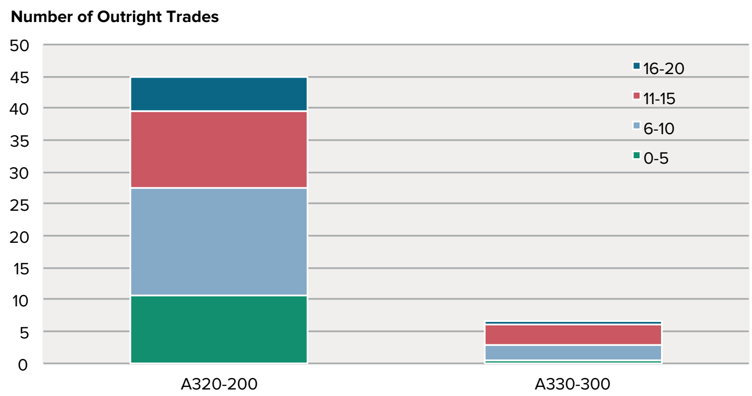


Exhibit 15. Past five years average secondary market outright transactions by age, 0-20

Source: Alton Aviation Consultancy analysis



it has evolved such that few transactions are well-represented by the criteria associated with the definition of current (or fair) market value, as established by the International Society of Transport Aircraft Trading (Istat), the organisation that accredits appraisers in the aircraft leasing and financing industry, including one author of this article.

Istat defines the market value as the appraiser's opinion of the most likely trading price that may be generated for an asset under the market circumstances that are perceived to exist at the time in question. Market value assumes that the asset is valued for its highest, best use, that the parties to the hypothetical sale transaction are willing, able, prudent and knowledgeable, and under no unusual pressure for a prompt sale, and that the transaction would be negotiated in an open and unrestricted market on an arm's-length basis, for cash or equivalent consideration, and given an adequate amount of time for effective exposure to prospective buyers.

In the primary market, OEM sales to airlines and lessors almost always involve multiple aircraft and, for a variety of reasons, the transaction price is not commensurate with the market value. The aircraft are very rarely purchased from the manufacturer in single quantity and the net price paid reflects adjustments for specification, escalation and credits attracted by volume purchasing power, as well as intangibles such as perceived strategic value to the OEM at the time of the order – frequently years in advance of delivery.

The benefit of pricing opaqueness can be debated, and certainly different participants take different views. For the OEMs, opaqueness allows for price discrimination across customers, while for customers, those with significant bargaining power are able to secure prices lower than what the OEM would publish, thereby setting a low-price precedent.

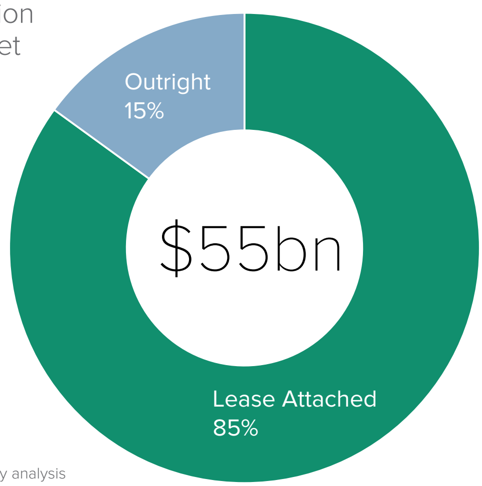
It is not only the largest orders that attract the best prices – strategic reasons may also come into play, such as gaining an established airline as a new customer whose existing fleet is entirely (or mostly) comprised of a competitor's aircraft. Conversely, OEMs may be less incentivised to sharpen their pencils for some customers that exclusively operate their aircraft, taking advantage of the high switching costs for training, inventories and ground-support equipment.

Outright transactions in the secondary market would seem to align most closely with the Istat definition of market value, and Alton's research suggests that an average of just more than 500 such transactions have been recorded over the past five years.

While this may appear to be a healthy volume of activity, when considered for an individual aircraft model and across a wide range of aircraft ages, the limits can be seen.

For the most liquid narrowbody aircraft with the largest fleet in service, the Airbus A320-200 model, an average of just 17 aircraft aged between six to 10 years old, has traded on an outright basis without leases attached over the past five years. For the A330-300, one of the most liquid medium twin-aisle aircraft, an average of just two aircraft has traded over the past five years. Such paucity of transactions does not provide a statistically significant number of comparables for valuations.

Exhibit 16. Distribution of secondary market transaction values (five-year average)



Source: Alton Aviation Consultancy analysis

On a value basis, those secondary transactions with leases attached, were over five-fold the value at $47 billion compared with those unencumbered at $8.3 billion.

Given the high proportion of transactions with leases attached, traditional metal valuations are insufficient to assess the majority of today's aircraft transactions.

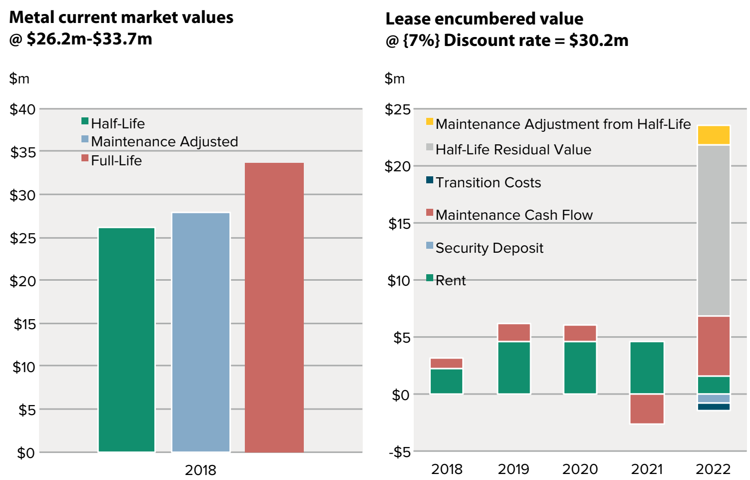
Transaction data is elusive and challenging to normalise

Perhaps even more impactful than the sparse volume of comparable transactions, the transaction confidentiality culture within aviation finance creates opaqueness. The market consists of a low volume of directly comparable transactions compared with selected other asset classes with a high proportion of confidential transactions. There is low incentive to share and publish trading prices and an inherent conflict of interest in appraisers providing transparency of methodology out of protection of intellectual property.

Even if these transactions had perfect visibility in terms of trading prices, other limitations in normalising those would still exist. Some of these trades would not be considered at arm's-length but between related parties (such as within an airline group).

Exhibit 17. Representative valuations, eight-year old Boeing 737-900ER

Source: Alton Aviation Consultancy analysis



In other instances, the willing sellers will have experienced financial or other pressures prompting the sale. Others will have been part of small portfolio sales, making it hard to ascribe market value to an individual aircraft or the discount for volume. Normalising the prices based on maintenance status to a theoretical half-life condition adds additional variables. In lessor mergers and acquisitions transactions, value may be allocated to the current fleet of aircraft, an orderbook and the leasing platform.

In sale and leasebacks and lessor trades – both in the primary market for new aircraft and secondary market for older aircraft – the very nature of the lease-attached transaction makes it challenging to discern true market value. In these transactions,

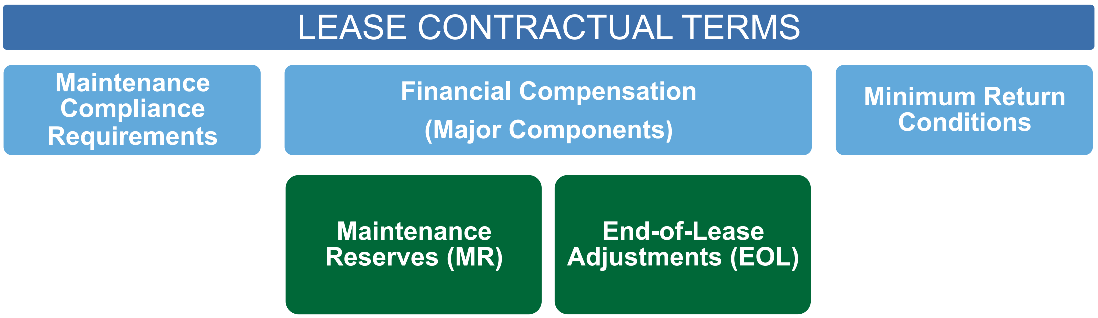
Exhibit 18. Components of lease encumbered valuation

Source: Alton Aviation Consultancy analysis

Lease rentals	• rental income is contracted between the lessor and lessee for initial lease; and • depending on the aircraft, lessee, and lease terms, an extension or re-lease may be considered most likely.
Security deposits	• a cash security deposit may be required of the lessee; and • Modelled as a cash inflow to the lessor at beginning of the lease and outflow at the end of the lease.
Maintenance cash flows	• typically monthly reserve payments for weaker credits to protect lessor from maintenance exposure in the event of default; and • stronger credit lessees are frequently able to secure terms requiring end-of-lease payment in lieu of monthly reserves.
Transition costs	• transition costs reflect an expectation of at least one other lease in the aircraft's economic life – as such, between leases, downtime and cost will be incurred; and • assumptions made to estimate – varies depending on aircraft specification, lease return conditions and future lessee aircraft specification requirements.
Residual values	• the projected value of the asset at the time of sale; • sale may be assumed at the end of the lease, at the end of an extended or follow-on lease – or as a lease encumbered asset; and • inflation and haircuts may be utilised for sensitivity and conservatism.
Discount rates	• discount rates should be a function of both asset and credit risk; and • the rates are applied to the relevant cash flows to determine the net present value.

Exhibit 19. Maintenance-related lease cash flow terms

Source: Alton Aviation Consultancy analysis



and others where the lease is sold attached to the aircraft, the price paid is not purely a measure of the asset's intrinsic value but also of its future income-generating ability to the buyer.

On these trades, a wide range of factors comes into play, including the seller's acquisition price or book value, credit and jurisdiction risk profile, lease duration, aircraft configuration, maintenance provisions in the lease (including reserves or end-of-lease payments), anticipated transition costs, expected residual values and lessor capital costs/return hurdles.

Additional transaction data and pricing knowledge beneficial

All of these factors that influence pricing are under constant evaluation by those in origination, pricing and trading roles at the leading aircraft lessors – informed by live deals won and lost.

While access to underlying transaction information remains a challenge for those not actively trading in the market, some of the factors influencing aircraft values along with aircraft leasing and financing economics are also not well understood by all participants in the sector.

In an industry environment that may be closer to a cyclical peak than trough, astute investors must develop a deep understanding of the myriad of valuation definitions, methodologies and underlying cash flows driving value.

Understanding cash inflows and outflows over the lease duration is critical

While typical metal valuations quantify the half-life current market value of an aircraft adjusted for its maintenance status, the lease encumbered valuation (LEV) considers the projected cash flows and determines the aircraft value based on the income earning potential during the lease and from the residual value. Valuation differences are represented in Exhibit 17.

The representative cash-flow projections illustrate what is expected over the term of the lease (from the owner/lessor prospective). In the case where the lessee pays maintenance reserves, the cash flows throughout the term of the lease include not only rents but also maintenance reserves payments/end-of-lease maintenance compensation adjustments. At the end of the lease, the half-life residual value is claimed and supplemented by the maintenance adjustment from half-life (which could be positive or negative), and the security deposit is returned. Transition costs should also be considered as part of any expected onward usage of the aircraft.

Lease encumbered values depend on interconnected cash flows

Lease encumbered valuations are increasingly relevant and used by the lessor community for pricing, but requires a significantly more complex approach than traditional metal valuations. There is not one standard industry methodology but LEV is calculated using an income valuation approach covering at a minimum the components in Exhibit 18.

The LEV is determined by first projecting each of the forward cash flows (lease rental revenues, maintenance cash flows, security deposits, transition costs and the estimated proceeds that would be generated from the asset's sale). Then, discounting these cash flows at an appropriate discount rate that is reflective of the cost of capital, riskiness of the asset, and credit quality of the lessees, as described below.

Lease rental cash flows are not guaranteed

While lease rates are contractually agreed by the lessee and the lessor prior to the start of the lease (typically as a fixed monthly amount for the duration of the lease), some variation does exist such as quarterly payments and floating or stepped rents.

It should be noted that cash-flow forecasts are the best estimate of the future at that point in time, but during the term of the lease, it is entirely possible that unforeseen events will take place that will have an impact on the subsequent cash flows. For example, if an aircraft is returned from lease early, this will not only have an impact on transition costs, but also future lease revenues, which are a function of market conditions at the time. Some lessees, when faced with challenges, seek to renegotiate commercial terms of the lease, leaving lessors with a decision about whether it is best to acquiesce or potentially incur costs and transition the aircraft to a new home.

Furthermore, after the contractual lease expiry, assumptions need to be made regarding lease extension, aircraft sale or re-lease and the terms and timing. These are also functions of market conditions.

Net sales proceeds, the ultimate cash flow, are likewise subject to risk

The proceeds from sales depend on a wide range of factors. The supply and demand dynamics for the aircraft type as well as that for the specific model at the time of disposition are a major factor. Additionally, the condition of the specific aircraft (age, specifications, maintenance status, records and pedigree), as well as the effectiveness of the sales campaign, will have an impact on the proceeds realised.

From a forecasting perspective, one or more valuation methods may be utilised:

- top-down approach, whereby reference values are utilised with adjustments made for maintenance and conservatism;
- bottom-up forecast that considers the green-time of major components and part-out values; and
- a lease encumbered value, wherein the aircraft is assumed to be sold with a lease attached.

Maintenance-related lease cash flows are a major driver of value

Leases specify maintenance compliance requirements during the lease, and minimum return conditions by which the lessee must abide while financial compensation for the maintenance deterioration of the major components is made either through maintenance reserve payments throughout the lease term or an end-of-lease adjustment. Typically, less creditworthy airlines are obliged to pay reserves throughout the lease for the protection of the lessor's exposure to the maintenance value deterioration.

If there is no default and the lessee adequately maintains the asset, the reserves are reimbursed after a qualifying maintenance event, wherein the asset is returned to full-life condition. In all instances, the aircraft owner is fully protected.

From a lessor's perspective, maximising maintenance cash flows features more prominently as the aircraft ages, with astute lessors becoming significantly more actively involved in maintenance events, which potentially quality for maintenance reserve drawdowns. In many instances, lessors try actively to negotiate such reimbursements, and try to identify other creative solutions to avoid.

End-of-life adjustments

Another mechanism through which the lessor can be compensated for maintenance value deterioration is end-of-lease adjustments. In the event that a lessee does not pay reserves throughout the course of the lease, a compensation adjustment is instead enacted at the end of the lease. This equals to the delta in the maintenance condition of the asset versus its lease delivery status.

For end-of-lease paying assets, the lessor bears the risk of maintenance exposure over the course of the lease and in the event of a default. This is typically extended either to strong airline credits, or to competitive markets for new assets, where the risk of default is lower. Lessees can procure a letter-of-credit from a third-party institution providing a backstop to the lessor against a potential default, thereby giving the lessor financial security to waive the maintenance reserves.

Generally, the net positive maintenance cash flows generated by a leased aircraft over its life compensate for the asset's value deterioration through its use, rather than providing extraordinary income to the lessor.

When aircraft are young, lessors anticipate utilising the accumulated maintenance cash flows to reinvest in the aircraft through heavy maintenance. Aircraft (and their components) approaching the end of their useful life are frequently retired and parted-out rather than restored, such that lessors do not have corresponding maintenance reinvestment outflows.

Transition costs are often a neglected factor

Aside from the aircraft being sold at the end of the lease, another alternative is an assumed re-lease. While the costs associated with this transition should be considered, their forecasting requires assumptions. Transition cost assumptions should capture the following elements, based on the precise specification of the aircraft, its minimum return conditions and the standard generally anticipated in the market:

Maintenance
- bridging maintenance programmes; and
- airworthiness directive compliance.

Reconfiguration
- interior and seats, galleys, toilets, in-flight entertainment, soft goods.

Upgrades
- engine thrust; and
- operating weights

Remarketing expenditures.

Conclusion

The typical aircraft life is 25 years. During that period, many transactions typically take place and many factors can influence the aircraft values along the way. Investors must be extremely cognizant of how they value each transaction.

Published blue book appraisal data such as full-life/half-life base, current market and soft market values are data points only of the metal, and somewhat simplistic data points at that.

As new investors continue to expand into the market, participating in a well-informed capacity increasingly requires developing a sophisticated understanding of the total value of the transaction including the lease, not only the appraised dollar value of the physical asset.

Delivering finance integration success through flawless execution: strategic value of IT in M&As

Many mergers and acquisitions fail to produce the desired outcome, because they stagger on the integration of operations and technology. A well-planned strategy for IT integration, in combination with other key aspects of the M&A process, ensure a successful combination of target companies.

With an enduring streak of mergers and acquisitions (M&As) in the aviation finance space, aircraft lessors have begun to look for ways to boost their M&A toolbox—in particular, enhance their internal capabilities to assess and integrate acquired companies successfully.

M&A is the most rapid way for a business to transform dramatically its position in the marketplace, changing the fundamental dynamics of an entity almost overnight by increasing the scope and breadth of the business and the paradigms on which it operates.

We all have read about deals where all elements seemed aligned, but synergies remained unattainable. In these instances, the company taking over and the platform being acquired may have had corresponding strategies and finances, but the integration of technology and operations often proved problematic, mostly because of inadequate consideration given to technology among other key aspects of the M&A process.

Zeevo Group has had the opportunity to live through and advise on a number of landmark M&A activities in the aircraft leasing sector over the past few years. Zeevo has found that the majority of the initiatives intended to secure synergies are primarily related to information technology (IT), but most IT issues are not fully addressed during due diligence, planning and post-transaction integration activities.

"To us, the role of IT in the M&A process has an increasing significance; it is a pivotal enabler of virtually every operating element in a combined company," explains Zeevo Principal Joey Johnsen. "To keep one's company on track while carrying out an intricate merger, acquisition or divestiture is a skill which needs to be part of every CIO's toolbox."

Johnsen notes that the Zeevo team was instrumental in one of the largest M&A transactions in the sector in recent years. "Our team successfully supported a leading global lessor in addressing their current or pending IT-related M&A due diligence, planning and post-transaction integration activities."

The companies seize a broader range of synergies, and at a much faster pace than competitors, when they take into account the challenges of IT systems integration, and ensure technology leaders contribute their perspective on the difficulty of systems integration throughout the process. IT-related costs in an M&A transaction can be considerable, and getting IT leaders involved early in the process is key to realising benefits.

"These leaders are more successful at sizing up targets and executing acquisition strategies, while their companies achieve the full benefits of successfully integrated operations," says Johnsen.

M&A lifecycle

"The Zeevo team's objective is always to help companies protect and grow shareholder value," adds Johnsen. "Our team has a field-tested methodology for helping clients in their efforts to manage M&A transactions, particularly as it relates to IT strategy and execution."

In assisting clients with M&A activities, Zeevo provides a full spectrum of advice and support for the entire M&A process, covering all six stages of the lifecycle (*see graphic*).

1. **Strategy**. With a well-crafted growth strategy, organisational structure, and support needed to act efficiently and effectively, management is better prepared to recognise possible mergers, acquisitions, or divestitures that could move the company toward its goals;

2. **Target** screening. Target identification and screening allows the company to develop acquisition objectives, create pools of target candidates, screen candidates through specific criteria, and select an acquisition best fit for the overall corporate strategy;

3. **Due diligence**. It pays to dig deep to uncover an acquisition target's true value and risk before the offer is made. Scrutinising financial statements and understanding tax implications is just the beginning. There's also commercial diligence work required to evaluate the potential impact on clients, markets and operations. Key back office areas, such as IT, demand special attention;

4. **Transaction execution**. With the deal structure and valuation finalised, it is time to close the deal. Sound financial, tax, accounting and legal advice can go a long way toward helping fulfill goals and avoid unnecessary risks;

5. **Integration**. Few operational challenges are more daunting than merger integration. It is a balancing act that requires close attention to meeting the expectations of all stakeholders – management, employees, customers and shareholders. In an ideal world, integration planning begins well before the deal closes to facilitate an issue-free Day One for the combined company;

6. **Divestiture**. Divestitures are not just mergers in reverse. Achieving the expected results is highly dependent on maintaining operational excellence while managing potential conflicts between the time of the announcement and the final execution of the divestiture.

Zeevo's M&A IT methodology

The IT component of Zeevo's M&A methodology and approach, focuses specifically on the following stages of the M&A process: due diligence; transaction execution; and integration/divestitures (*see below graphic*).

"Zeevo's M&A IT methodology has been developed specifically to assist CIOs and their peers in finance and operations to effectively address the challenges encountered by their organisations during all stages of the M&A lifecycle," says Johnsen.

Due diligence

When done effectively, adds Johnsen, "due diligence can help develop an understanding of a target's IT strategy, IT operations and organisation, identify risks, including those requiring immediate attention, and assess potential IT cost synergies or cost-reduction opportunities."

Key considerations:

- **IT structure**: IT organisation's structure, strategy, current/planned projects, end-user support and expenditures on operations and capital outlays;
- **infrastructure**: hardware, operating systems, databases, networks, internal and external interfaces, number of physical locations, data centres and IT help desk or call centres that may be in-house or outsourced to a vendor;
- **applications**: key enterprise applications, such as those deployed for enterprise resource planning, customer relationship management and supply chain management, document management, workflow and enterprise information management applications;
- **vendor management**: procurement arrangements, third-party supplier contracts, security and disaster recovery.

Best practices:

- **assign the right people**: make sure the CIO (or designee) is a member of the M&A team and involved throughout the due diligence process;
- **identify requirements**: understand what IT investments will be required to realise both short- and long-term benefits;
- **identify costs**: make sure the cost model includes required short- and long-term IT investments, software licensing and any required transitional service agreements (TSA);

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Many mergers and acquisitions fail to produce the desired outcome. This is because they stagger the integration of operations and technology. It is imperative for business leaders to assess both companies' IT with the same rigor that is applied to the assessment of their financial statements.

The Zeevo team's expertise and experience across the full spectrum of IT-related M&A activities are unmatched in the aircraft leasing space. We can assist your leasing platform to develop and execute a successful IT integration strategy in line with all other aspects of the M&A process.

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- **work closely with the business**: having IT work closely with the business encourages strong working relationships and joint ownership in driving the process forward;
- **prepare information request in advance**: prepare and submit information requests well in advance to allow sufficient time for preparation and delivery of all documents;
- **prepare a work plan for the due diligence team**: a well-prepared workplan will ensure that all key areas are properly reviewed, analysed and reported back to the team by set deadlines;
- **coordinate with external auditors**: facilitate coordination for both parties as soon as the due diligence process is launched;
- **identify key risks in a timely fashion**: identify and address any risks on both sides right away in order to gain comfort or determine solutions.

Transaction execution

IT integrations or separations are typically complex initiatives that "should be closely aligned with the business integration or separation effort", says Johnsen. "Focus for the IT organisation needs to include both the M&A activities, as well as day-to-day activities to keep the business running effectively."

Key considerations:
- **governance**: strategy, policies and monitoring of the transaction;
- **integration blueprinting**: organisational, functional and technical requirements for integration;
- **synergy analysis and planning**: foundation for accelerating the realisation of benefits from the integration;
- **TSA strategy**: determination of which services to cover under a transition services agreement in the event that the buyer lacks the necessary IT capabilities or capacity to support the integration.

Best practices:
- **select the appropriate integration model**: if the transaction is an acquisition, determine the end state for IT systems and processes – i.e., consolidation (conversion to the acquiring company's processes and systems), combination (best-of-breed processes and systems from both companies), transformation (new processes and systems across both organisations), or parallel (each organisation retains its own processes and systems);
- **select the appropriate divestiture model**: if the transaction is a divestiture, determine how IT systems will be separated – e.g., cloning systems, extracting data from systems and handing over to buyer, handing systems over to buyer, or some hybrid model;
- **focus on data conversion and migration planning**: in addition to general ledger data, for lessors, maintenance reserve balances, technical data (avionics, weights and operational data), leasing portal data, material master data, technical projects and MRO data are all important data sets that warrant detailed plans in the overall divesture/integration project plan. Technical records (and related interfaces) and legal entity management are also data sets that warrant their own plans;
- **pay special attention to workflows and document management systems**: consider each company's existing workflows; document management systems and the meta data that keeps them organised. The ease of use of the end state document management system should be addressed early in the planning phase;
- **establish IT performance metrics**: measure the process of the integration consistently and accurately;
- **clearly define the IT interim and end states**: the end state is characterised by the completion of all transaction activities. The interim state is the period in which buyer will establish and maintain operational control over target activity, but prior to the complete integration of processes and systems;
- **think about user access and segregation of duties**: understand and document Day One user access requirements, and ensure segregation of duties.

Integration/divestiture

The integration/divestiture execution priorities focus on process and technology integration or separation in order to realise the synergy benefits—the objective is to reach the end state effectively.

"Meeting Day One requirements and positioning for Day Two business processes are difficult while simultaneously trying to operate in an environment of business as usual and separation," emphasises Johnsen. "A well-orchestrated and openly communicated analysis of existing processes can help integration participants define new processes that capture the most effective existing practices and industry benchmark practices."

The M&A IT methodology covers the full spectrum of IT integration/divestiture topics in these four major areas:
- programme management office (PMO) and governance;
- infrastructure;
- applications;
- vendor management.

PMO and governance

Key to the success of an integration is a strong PMO to support each functional area's project plans. Similarly important is establishing guiding principles for the post-merger integration programme.

With guiding principles documented and understood, the team, from the steering committee members to the functional leads, will be armed with decision-making criteria. Guiding principles go hand in hand with a well-documented integration strategy. The strategic objectives for the integration should be clear and communicated to the project team.

Johnsen expands that "to achieve the end state, activities must first focus on the proposed interim state in order to align the businesses in the short term, while longer-term activities, such as IT integration, are conducted".

End state

The end state is characterised by the completion of all integration activities and may not be achieved until FY##. All target transactional activities are transitioned to the buyer's shared service model.

Interim state

The interim state is the period in which buyer will establish and maintain operational control over target activity, but prior to the full integration of processes and systems:

- **target activities** would be transitioned (outsourced) to buyer's functional team;
- **buyer manages target activities** in the existing target systems environment;
- **select systems** (eg, payroll, contract management system) might be integrated prior to the full systems integration;
- **integrity of target legal structure** maintained until the end state is achieved;
- **buyer provides necessary liquidity** to target, but target continues to manage its day-to-day operations.

The following issues are often identified and must be resolved in order to facilitate an efficient and effective integration:

- **strategy**: how do we deploy to target countries/ functions during the interim state?
- **breakage in reporting integrity**: how will target's management team continue receiving data they need to run the business?
- **premature attrition of key buyer personnel**: how will open positions be backfilled?
- **IT integration strategy**: when will systems be integrated and how will that impact activity?
- **other functional area integration strategies**: when will strategies be defined since IT has many dependencies on other areas (e.g., payroll/HR)?
- **customers**: how will we describe the joint value proposition and how will we face joint customers? Who leads the relationship? How will we effect joint sales or pass leads before integration?
- **technology**: what will the technology/product roadmap be?
- **supply chain**: can the supply chain, or inventory, or suppliers handle increased volume from early revenue synergies or cross sales? Can we gain synergies out of a more efficient supply chain?
- **PMO**: how will we structure and govern the integration programme and decision-making?
- **competition**: how will we ensure that our main competitor does not use this transaction as a distraction to take market share?
- **employees**: how will we address employee concerns? How will we communicate with employees and maintain optimum productivity through the integration?

Case study: integration

A leasing company was acquiring another, larger leasing company. The integration strategy was one of consolidation – i.e., conversion of the target companies' processes and systems to the acquiring companies' processes and systems.

Critical success factors:

- retirement of all the target company's systems as part of the integration process; and
- adoption of the acquiring company's business processes to manage the target company's transactions.

Challenges:

- the complexity and nuances of many of the target company's transactions were not supported by the acquiring company's systems;
- some of the target company's systems were more robust enough, resulting in challenges moving to target systems and end-user adoption by the legacy employees.

Solution:

Zeevo was brought on board to perform a methodical assessment and comparison of core systems used by the acquiring and target companies, particularly in the areas of document management, workflow management, and the management of aircraft delivery, return and transfer transactions. In addition, the Zeevo team joined the PMO to provide regular status updates on the progression of the assessments.

Results:

As a result of the assessment performed by Zeevo, the acquiring company ultimately made the decision to switch from a consolidation integration strategy to a combination strategy where the best-of-breed systems across both companies were implemented. This resulted in enhanced application capabilities for the combined organisation and the ability to support the more complex leases in a systematised fashion.

Zeevo also worked closely with third-party vendors for the acquiring company's systems to design, develop and implement system enhancements to extend further the capabilities of these applications. This process involved gathering and documenting user requirements, working directly with the development teams on implementation, developing and executing test cases, and end-user training.

Case study: IT programme management

A large consulting organisation was engaged by an acquiring company to develop and manage an IT integration execution plan with detailed IT activities and resource requirements.

Critical success factors:
- the development of a comprehensive plan for the IT organisation, including detailed work streams, tasks and resource assignments;
- management of the plan during the integration phase, including the management of project issues and risks, and related escalations to the steering committee.

Challenge:
The primary challenge facing the consulting organisation was its lack of experience in the aircraft leasing industry and its resulting difficulty in producing a detailed plan that covered all aspects of the IT strategy. This challenge introduced overall risk to the project, not meeting fixed project deadlines.

Solution:
The acquiring company engaged Zeevo resources to take over the development and programme management of the IT integration plan across all sectors of the IT organisation.

Results:
Zeevo transformed the more general, work-in-progress, plan into a detailed project plan across several workstreams, including infrastructure, applications, data conversions and transitional service agreements.
As members of the PMO, Zeevo maintained the programme plan, reported detailed status to the steering committee on a weekly basis, and worked with both the IT and operations organisations to mitigate risks and resolve project issues across all the workstreams.

The IT integration plan was ultimately executed within the integration time constraints.

Infrastructure

The objectives of this area include assessing the current IT strategy to revise IT to include application implications, and analysing the current technology environment in order to identify gaps between the existing and future technology architectures.

"When planning for infrastructure, you want to analyse the current technology infrastructure with regard to the high-level application requirements. Components of the architecture that are analysed in the infrastructure domain include the server system(s), third-party software and tools, network technology, operations technology, database technology, and workstation technology," says Johnsen.

Tailoring a matrix to collect and analyse infrastructure will enable transparent communications and a common understanding of the infrastructure landscape.

There are a number of infrastructure-related questions that must be addressed:
- any current infrastructure changes underway;
- network operating system being used;
- details on existing software license agreements;
- number of sites and network connectivity to those sites;
- topology being used;
- standard desktop applications and operating system;
- standard server hardware/software;
- messaging environment (e.g., Slack, Skype);
- network protocols being used;
- storage;
- network hardware (eg, wireless access points, LAN controller, virtual private network switches, routers);
- network monitoring applications;
- systems management;
- internet service provider(s);
- network security;
- encryption;
- voice platform;
- cabling infrastructure;
- disaster recovery site(s);
- annual IT costs – are these all accounted for within the IT/finance cost centres or are they cross-charged to other functional cost centres?

Network latency — how long it takes to run a report, as an example — is one area that should receive special focus. Often, when a company expands through acquisition, the combined company has a larger geographical footprint. Working across borders, comes with certain costs and benefits. With careful planning, you can avoid users waiting an hour for a report to finish when they expected the same in minutes.

Applications

A software assessment that examines the current legacy software systems and produces an initial high-level assessment of the environment and development requirements of the to-be systems produces a high-level systems map that identifies the "as-is" and "to-be" systems environments.

Johnsen explains that "gathering information about the known development efforts for interfaces, enhancements and conversions is key to the application inventory. Understanding the home grown and third-party software applications that exist within the target's current architecture is also important".

Business applications, such as programmes for documentation management and workflow, should be included. "It's important to highlight any potential software that will be replaced by the new planned architecture," says Johnsen.

Additionally, one should include entries for highly dependent applications. At a minimum, consider the following items when assessing the bespoke/homegrown and third-party software:

- functionality, IT strategy synergy and business critical success factors;
- existing version and how current it is;
- degree of customisation and documentation;
- number of current users and nature of user interface;
- degree of utilisation of the product and ease of use;
- existing deployment and support procedures.

Other application-related information is needed during due diligence and/or during integration.

Examples of necessary information include:

1. Describe which applications are used for the following:
   - financials – general ledger, expenses, procurement. revenue and receivables, fixed assets;
   - asset management;
   - compliance/internal audit – include any enterprise risk management applications;
   - lease and contract management;
   - financial planning and analysis – forecasting, purchasing, planning;
   - insurance;
   - reporting/business intelligence – financials, revenue, technical;
   - workflow management – including any integrations with other applications;
   - legal, corporate secretary – document management, subscriptions (eg, board of directors-related applications), signing authority/key decision rights;
   - marketing – consolidation of market data (is external data purchased? From whom?);
   - portals – MROs, technical, marketing;
   - pricing;
   - risk and credit management;
   - tax;
   - HR/payroll – what systems are used in these areas?
   - travel portal;
   - statutory filings and/or US Security and Exchange Commission;
   - email archiving;
   - treasury operations, including debt management;
   - site access security system (e.g., swipe cards, video cameras).
2. Total number of systems:
   - all automated systems and their applications;
   - all manual systems and their applications; and
   - all outsourced systems and their applications. Include copies of outsourced application contracts showing terms and conditions.
3. Outsource company and contact.

Case study: IT infrastructure planning and execution

A leasing company, as part of an acquisition, had reached an agreement on the desired state of the IT infrastructure for both Day One and the end state – its challenge was to develop a comprehensive “how to get there” plan.

Critical success factors:

- a prioritised list of what infrastructure tasks/ deliverables were required for Day One;
- an understanding of what tasks could be accomplished by Day One and what tasks needed to be deferred to the integration phase of the project;
- an assessment of security rights requirements both from an infrastructure and application perspective;
- a detailed network integration plan, including the ordering of new scalable and dedicated circuits, and the implementation of appropriate firewall access rights and restrictions on Day One;
- a combined active directory and messaging/email solution on Day One; and
- a transition plan for the target company data and disaster recovery centres, including core servers and infrastructure that would be retained as part of the integration.

Challenge:
The acquiring company had neither the bandwidth nor infrastructure experience to create and implement the plans necessary to achieve the target dates.

Solution:
Zeevo was engaged to support the IT infrastructure planning across a number of areas. The Zeevo team collaborated with IT and the operations units to document and facilitate approval of the required network and application access requirements for the combined organisation.

A detailed test plan for access rights was developed and executed. Zeevo assisted with the evaluation of regulatory, compliance, data retention and security requirements related to the integration of email and messaging services across a global infrastructure.

In addition, a detailed plan for how the active directory domains and privileges was developed. The Zeevo team developed a multiphase plan to transition the data and disaster recovery centres from the target company to the acquiring company, based on the priority of relocating and/or retiring applications hosted by the target company.

Results:
Integration of the IT infrastructure was a critical path item for the M&A PMO. The planning and support from Zeevo enabled the rapid infrastructure changes that were required to support the M&A activities. The infrastructure improved and increased the synergies of the different operations teams across the two organisations.

Case study: data conversion

A leasing company was acquiring another, larger leasing company. The synergies of the acquisition, based on plans, including migrating all of the target company application data (including financials, purchasing, assets and contracts) to the acquiring organisation's systems via manual data entry and automated data conversions.

Critical success factors:
- data entry, conversion, validation and reconciliation completed within the integration timeframe;
- minimal disruption to business day-to-day data entry activities during the conversion process.

Challenge:
One of the biggest issues facing the acquiring company was the completion of the data entry and conversions, as well as subsequent validation of the data in the timeframe set forth by the PMO. Exacerbating the exercise was the limited availability of third-party application vendor support and automated data conversion tools.

Solution:
When it became clear that the success of the data conversion projects in the allocated timeframe was at risk, the acquiring company engaged Zeevo to develop a risk mitigation plan and detailed execution plan. The approach also involved Zeevo IT developing automated data extraction, validation and reconciliation tools to expedite the conversion process with primary focus on the general ledger, asset utilisation, maintenance reserve charges and maintenance reserve fund balances.

The Zeevo team joined the PMO to provide regular status updates throughout the course of the project.

Results:
An integrated team approach was adopted whereby Zeevo worked together with the acquiring and target companies for planning and execution. Zeevo developed detailed execution plans down to the asset and lease level. As a result, Zeevo was able to identify critical path transactions where the level of complexity was high or where there were data integrity issues. Zeevo rapidly developed automated ETL (extract, transform, load) tools using Microsoft SQL Server.

In addition, Zeevo used SQL Server to develop scripts to reconcile source and target systems automatically. The automation effort greatly reduced the time to completion for the data conversion activities, enabling the acquiring company to meet its integration deadlines.

4. Give a narrative of each application (what does it do, used for what purpose).
5. Applications run on what platforms.
6. Output used for what purpose.
7. Output feeds what system(s).
8. Output retention policy for data and files.
9. Application coded in what language(s).
10. Database(s) used.
11. System/application dependency.
12. For each system/application – home grown or package.
13. Vendor name, if commercial off-the-shelf/out-of-the-box software package.
14. Annual maintenance and support fees:
    - hardware maintenance;
    - software maintenance/licensing
    - internal resource costs;
    - external resource costs.
15. System retirement date(s), if known.
16. Centralised/decentralised application.

Vendor/Supplier Management

When investigating vendor relations, the following aspects should be considered:
- organisation-owned components;
- lease/rent components (refer to infrastructure table above and also the application inventory);
- responsibilities/outsourcing;
- installation;
- maintenance;
- service level;
- performance responsibilities.

"Use the transaction as an opportunity to amend vendor contracts to reflect new merged legal entity and utilise the payment terms of common vendors as leverage for negotiating the newly merged organisation's future vendor contracts," suggests Johnsen.

Lessons learned

Johnsen continues by emphasising that "merger, acquisition and divestiture transactions are not easy. They are filled with pitfalls and blocking issues to achieving the expected benefits".

Here are a few lessons learned over the course of Zeevo's experience with M&A transactions:

- **open, honest communication** has the power to drive the realisation of business goals;
- **deliver information** quickly and consistently;
- **engage internal audit early**: internal audit's role in the transaction should be defined early. Opportunities for involvement in the phases of M&A depend on the maturity, size and competencies of the audit team;
- **slow down to go fast**: take the time to plan. Plan, plan, plan – it is rarely possible to over plan;
- **adopt "as-is" capabilities**: "adopt and go" (pick the best of what exists and integrate rapidly) allows decisions to be made quickly and assures that combined company will work on Day One and after.

Resist the temptation to build something new and better. Improvements can, and will, be made after the integration is complete, and the combined company is up and running. Expect to iterate after Day One;

- **establish clear decision criteria**: it is also important that the decision criteria for selecting the adopted capability be very clear, since these choices tend to be viewed as win/loose, can drive job losses and can be very emotional;
- **exceptions require effort**: if an exception must be made to the adopt and go principle, put significantly more effort in managing the planning and integration in this area. After the merger, keep a team in place to monitor and resolve the unanticipated issues that arise for as long as is necessary (some of these areas can take years);
- **pareto principle**: 80% of decisions were no-brainers. Make these fast, then work on the difficult ones;
- **provide the needed time** for people to assimilate changes;
- **do not take cultural issues** for granted. Perform a full-impact assessment;
- **begin integration planning** in parallel with deal negotiations;
- **ensure IT functional representatives are involved** with developing and approving pre-close TSAs;
- **document the IT integration strategy** to ensure alignment with other functional areas and other initiatives;
- **clearly communicate executive commitments** and designate an internal resource to lead IT integration when the deal is announced;
- **set up an IT-specific arm of the PMO** to track milestones and identify/address identified integration issues;
- make the integration effort the **same priority as running the ongoing business**;
- **do not skimp on assigning resources**, especially in challenging circumstances.

Johnsen concludes: "CIOs should have the license to be involved through all stages of the M&A lifecycle; it enables the IT function to better plan and budget for the activities, costs and risk mitigation to achieve the desired synergies."

How can Zeevo help?

Whether this is your first acquisition — or your 100th — Zeevo is here to assist. As acknowledged by industry, our experience in assisting clients across the full-spectrum of IT-related M&A activities is unmatched in the aircraft leasing space.

Zeevo Group's M&A consultative services covers strategy, integration, divestiture, human capital, information technology, financial advisory and tax planning. Our purpose is to assist companies to protect and grow their shareholder value.

If you are looking for a seasoned adviser with real-world experience, we are ready to assist. Visit **zeevogroup.com** for more information or reach us at **contactus@zeevogroup.com** or **+1 760 933 8607**.

Case study: vendor management

As part of an acquisition, a leasing company required an extensive infrastructure and application vendor inventory and risk management assessment. The goal was to produce an exhaustive list of IT vendors under contract with both companies, assess licensing rights, evaluate any pricing synergies and identify any potential risks to the integration process.

Critical success factors:

- a complete list of IT vendors used by the target company;
- a comprehensive analysis of the vendor contract landscape and associated identification of integration risks and integration synergies.

Challenge:
Both the acquiring and target companies did not have a readily available catalogue of third-party vendors and consolidated access to IT vendor contracts.

Solution:
Given the project resource constraints, Zeevo was engaged to perform the third-party vendor analysis:

- creation of an exhaustive list of infrastructure and infrastructure IT vendors based on interviews with key personal using predefined checklists created by Zeevo;
- identification and prioritisation of critical vendors;
- creation of a cost model for critical vendors and identification of cost-reduction opportunities (eg, improved volume discounts);
- summarised analysis and industry insights for the relationship managers for license negotiation;
- risk assessment of critical vendors, including contract ownership, reliance on a small number of major vendors and potential conflicts between vendors and the integrated organisation;
- generation of status and risk reporting for PMO.

Results:
As a result, the acquiring company was able to allow sufficient time for contract negotiations to secure its own contracts for those agreements that could not be assigned. In addition, a subset of vendors was engaged earlier in the transaction execution phase to ensure contractual compliance on Day One.

Based on the analysis, the acquiring company was able to negotiate pricing discounts with a number of its major vendors based on the increased fleet and transaction volumes of the combined organisation.

What's on the mind of GECAS's leaders?

GECAS executives tell *Airfinance Journal* about the challenges and opportunities in the leasing and finance market.

In the more than 50 years since its initial aircraft lease, Norwalk, Connecticut-based GECAS has built up the biggest portfolio in global aviation. More than just aircraft, though, it has added a broad array of financial and other services to its core operating leasing offer in a bid to provide its customers the most tailored solutions possible. Debt finance, engine leasing, helicopter leasing and part-out are just some of its extra capabilities, while the lessor's ongoing relationship with GE Capital means it is never short of funding.

Nonetheless, GECAS cannot afford complacency at a time when deep-pocketed competitors are expanding and eyeing greater market share. In response, the lessor has diversified its funding sources and established new relationships and customers in the fastest-growing air travel markets. At the same time, it has maintained a sharp focus on its core business of placing, monitoring and transferring aircraft to ensure customers retain their faith in GECAS's ability to execute even the most complex leasing deals.

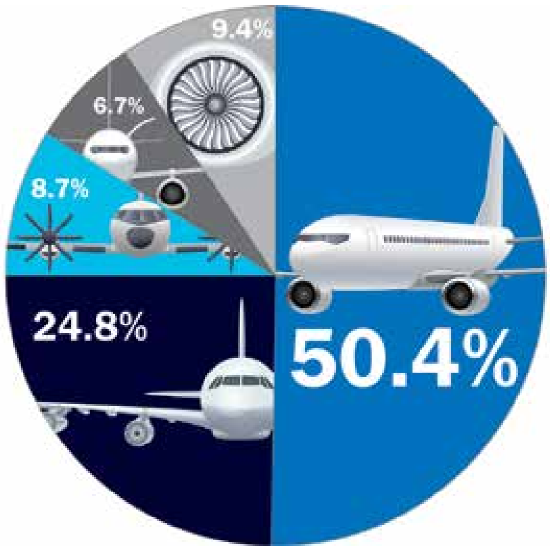
Here, in a roundtable discussion with *Airfinance Journal*, GECAS leaders outline the challenges and opportunities in their domains of the leasing and finance market. From booming emerging economies to Chinese trade tensions; from the rise of no-frills carriers in Latin America to consolidation in Europe; and from changing investor appetites to risk management, their thoughts provide a comprehensive overview of the global leasing market and how it might evolve in the coming decades.

Leasing has become a cornerstone of aircraft procurement, with about 40% of the global fleet now on operating lease. Can we expect such growth to continue and what does this mean for GECAS?

Declan Kelly, chief commercial officer, GECAS: Air traffic growth has proved to be remarkably resilient. Mature markets such as the United States and Europe may be expanding more slowly than in the past, but that's more than compensated for by wider opportunities in other parts of the world such as China and the rest of Asia. With this global expansion of the industry there's obviously a strategic opportunity for lessors to grow and serve commercial aircraft operators.

That said, the past few years have been a period of retrenchment for some of the big lessors. Our main competitors have tapered down their books with us, but now they are targeting growth and we need to grow alongside them. That's not for vanity's sake or bragging rights – we must remain in the top tier of competitors to stay relevant and keep our purchasing power with the OEMs [original equipment manufacturers]. If you're just in the sale-and-leaseback market it's difficult to give

GECAS portfolio by type (Q2 2018)



your customers what they want, when they want it. Also, if you're only competing for cheap money on sale and leasebacks, then that's a race to the bottom.

What really excites me about GECAS's future is that we can pursue multiple avenues for growth. We are looking to rebuild and, in fact, grow our aircraft under GECAS management with serviced entities which allow us to grow with more speed than using our balance sheet alone. In June, for example, we closed a $587 million asset-backed securitisation that covers 24 aircraft on lease to 16 airlines in 15 countries. From that we'll draw servicing fees and capital to pump into new acquisitions. Another example is Einn Volant Aircraft Leasing, our $2 billion sidecar with Caisse de dépôt et placement du Québec. Clearly, investors trust us to manage those assets effectively because of our unmatched pedigree in aircraft leasing and everything that brings with it: our technical acumen, our customer network and our success whatever the stage of the business cycle.

After a period of selling aircraft, what are GECAS's plans for its portfolio?

Alec Burger, president, GE Capital, and president and chief executive officer (CEO), GECAS: For the past few years GECAS has taken advantage of the tremendous sellers' market that has existed, but as we move forward GECAS is targeting growth. Over the next two to three years, our balance sheet will expand again after a period in which we were selling almost as much as we were originating. We weren't alone in that, however: in recent years other large lessors have taken advantage of the sellers' market to reduce their fleet sizes and clean up their portfolios.

As GECAS starts to grow again, will it be via direct orders, sale and leasebacks or portfolio purchases?

Burger: We're looking to deploy between $6 billion and $7 billion of capital in 2018 alone. That's a big number to satisfy so, yes, we may consider other portfolios. On the OEM side, our orderbook is heavily skewed towards narrowbodies. We have 10 Boeing 787s on order and the rest are Airbus A320s or Boeing 737s. When we look at supply and demand characteristics, we're very comfortable with that position. For widebody aircraft, we are currently satisfied with the returns we generate from sale and leasebacks, which have allowed us to maintain quite a strong widebody presence.

We will continue to monitor changes in the market to evaluate if a widebody new order makes sense for us in the future. Buying new aircraft from airlines makes less sense for narrowbodies, though, because the sale-and-leaseback market has become extremely competitive, resulting in fewer opportunities that will generate the profits we require. Our overall growth plan is a combination of sale and leaseback with the appropriate risk/reward balance, direct order and potential portfolio plays.

"We will continue to monitor changes in the market to evaluate if a widebody new order makes sense for us in the future."

Alec Burger, president, GE Capital, and president and chief executive officer (CEO), GECAS

GECAS is the world's largest lessor by fleet size and that scale clearly gives the company an unrivalled product offering. What else does the company provide airlines beyond traditional leasing?

Dan Rosenthal, executive vice-president (EVP), financing and products, president and CEO, Milestone Aviation: It may sound a bit clichéd, but GECAS genuinely does offer more than money. Serving well over 200 airlines around the world, there is no one-size-fits-all approach and we always focus on delivering solutions for each individual customer. A low-cost carrier in Latin America has a very different web of stakeholders and interests than one in North America and to meet any airline's specific needs – which are often more complex than a bare-bones purchase and leaseback – we have developed a toolkit of products and services unmatched in the industry.

That toolkit cracks open parts of the market that sometimes appear inaccessible to mainstream lessors. That's where our ability to adapt to a customer's individual financing needs is crucial. Our flexibility extends across the board. We can take on the larger and more complicated deals, offer a debt component, predelivery payments and forward commitments. We can leverage the scale of our portfolio and orderbook to rationalise fleets and keep them young. One way is at lease expiry, when we can offer a different aircraft rather than a lease extension. Meanwhile, our engine leasing business helps minimise down time.

Furthermore, our ability to reposition aircraft through our global network means we can offer take-outs — where an operator wants to replace existing equipment with, for example, Boeing 737 NGs to Max. Our scale allows us to find a new home for the NGs. All lessors can tap market liquidity to chase a one-off deal, but managing a portfolio of scale, building the expertise to serve each individual customer and sticking with them through multiple cycles – that's the value our customers rely on and that's what truly differentiates GECAS.

GECAS has launched some heavyweight sidecar vehicles for aircraft leasing in recent years. How do these alternative structures fit into the company's growth plans and are they a response to evolving demands from investors?

Greg Conlon, EVP, trading and business development, GECAS: In the global search for yield there are only a few big-ticket asset classes. Shipping, hydrocarbons and aircraft are probably the main examples and of those only the aircraft market has stayed strong. Aircraft leasing is a beacon for investors hungry for yield in a low-interest-rate environment, and cheap capital is crucial to compete with these new entrants, which are backed by attractive funding costs. Institutional investors have plenty of capital-chasing investment and aircraft continue to offer them a greater risk-reward return than other opportunities in the current environment.

At the same time, investors have become more sophisticated and demanding. They are seeking opportunities that meet today's investment criteria, which means the asset-backed securitisations of the past may no longer be suitable. Of course, they still work for some, but the new serviced structures have more investor activity and allow for a broader range of portfolio management options. This has drawn in new players such as Canadian pension fund CDPQ, which chose us for its first-ever aviation investment – our $2 billion sidecar, Einn Volant Aircraft Leasing.

That is one of a few sidecar transactions GECAS has launched so far, and each has seen a tremendous amount of interest from the investment community. Pension funds, banks, sovereign wealth funds, insurance companies and others have lined up to partner with us given our global reach and servicing capabilities and that's great for long-term sustainability. More importantly, partner investors diversify our funding and give us access to cheap capital, which in turn allows us to stay competitive with other lessors and remain active in areas such as the sale-and-leaseback market. Given the size of aircraft transactions, you can quickly hit your risk appetite, and this allows us to manage our credit constraints while continuing to grow the business with new-technology aircraft orders.

What is GECAS's approach to portfolio composition and credit risk, and how will this change as new-technology aircraft enter the global fleet?

Virginia Fox, chief risk officer, GECAS: GECAS has an investment framework that filters opportunities by asset, credit and country/region to manage the amount of risk we assume at the portfolio level. It's inevitable that some airlines will default, but prudent upfront risk management and our ability to work pro-actively with lessees when things go wrong coupled with the huge network of potential customers and our expertise in placing aircraft means that we are well positioned to manage any fallout.

> *"Aircraft leasing is a beacon for investors hungry for yield in a low-interest-rate environment, and cheap capital is crucial to compete with these new entrants."*
>
> **Greg Conlon**, EVP, trading and business development, GECAS

At present, GECAS's portfolio comprises more than 50% narrowbodies and about 25% widebodies by fleet value, and is well diversified across all regions. Our longer-term portfolio plan is built with an eye toward technology, economic and demographic trends, as well as anticipated customer preferences. So this would take into account factors such as Asia's growing middle class, aircraft fuel efficiency and the ongoing spread of low-cost airlines, among many others.

Transactions are assessed within this overall portfolio plan, requiring GECAS to balance meeting purely financial targets with working towards our preferred future portfolio. If we do this right, we finish each year having both met financial targets and having strengthened our portfolio.

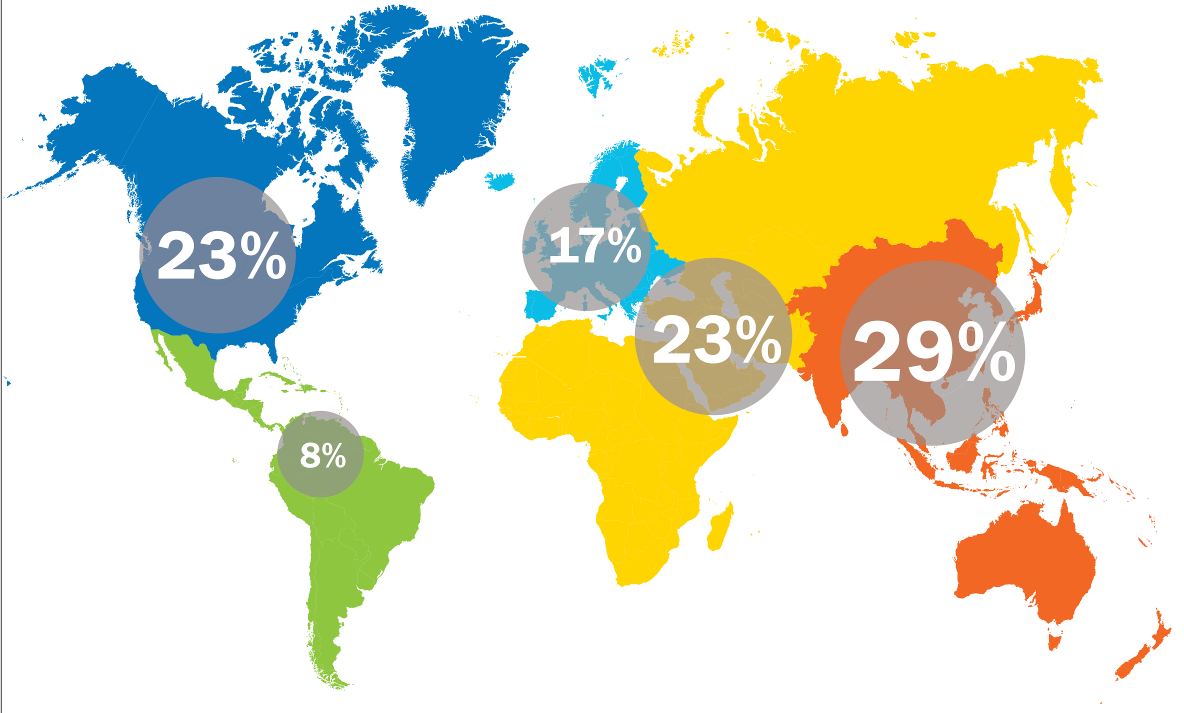
Why has GECAS supplemented its operating leasing with alternative asset finance solutions and what benefits do its customers gain from this?

Paul Meijers, president, PK AirFinance: GECAS may be most famous for operating leasing but our skills on the debt finance side are considerable. PK AirFinance has operated under GECAS since 2000 and has a portfolio of debt secured by 320 aircraft.

Asset-based lending by PK AirFinance is a great complement to our operating lease offering. Not only can we leverage the strength of GECAS's global network for asset management to give us a true asset-based focus, but also we can offer airlines multiple financing package solutions including debt on aircraft or engines along with our leasing offerings.

Many GECAS customers want a mix of debt and lease finance. Some airlines want to build up their balance sheets by investing in aircraft assets. More control of the ownership of their assets gives them more flexibility – for instance, to raise capital on unencumbered assets to pay for predelivery payments on new equipment. Airlines clearly appreciate our ability to provide this, and, as an example, Lion Air agreed a financing deal for 51 narrowbody aircraft with leases from GECAS and debt from PK AirFinance earlier this year. We have seen many airlines start their operations with leased aircraft but at some stage they want to build up their balance sheet and

GECAS fleet by region (Q2 2018)



start owning some assets – Easyjet is a good example. There are many ways to approach the financing of an aircraft and each airline will have its own criteria at various stages of its development. To meet these, PK AirFinance offers various structured financing solutions to airlines in addition to our offering to third-party lessors.

While working jointly with GECAS is an important part of PK's business, the biggest part is standalone financing to airlines and leasing companies, as sole lender, as part of syndicates, or on occasion in cooperation with junior lenders. Given its establishment in Japan – which goes back more than 20 years – PK has ample experience from tax-driven structures such as Japanese operating leases and Japanese operating leases with call options [Jolcos].

Through the unrivalled experience of GECAS in working worldwide, PK is very open to working in all types of jurisdictions. As an example, PK recently acted as majority co-lender in a Jolco transaction for an African flag carrier.

Alongside its aircraft business, GECAS has the largest engine leasing operation in the world. How do the dynamics of the engine leasing market differ and what do you expect going forward?

Tom Slattery, senior vice-president, engines, GECAS: Engine leasing is the structured financing and provisioning of spare commercial jet engines. It is still an evolving business and has additional dynamics to aircraft leasing. For one thing, there are far fewer players: engine leasing is still limited to a handful of independent lessors and the major OEM-affiliated leasing companies, which have a large market share.

Another big difference from aircraft leasing is the demand cycle for spare engines. Aircraft demand is driven by fleet replacement and passenger travel growth. Typically, equipment is retired and replaced with new on 20- to 25-year cycles. Spare engine demand, on the other hand, is influenced by reliability and maintenance cycles. In addition, useful lives can be significantly longer with older engines having the same utility value as new engines of the same type.

Despite our connection to GE, GECAS leases engines from all commercial engine manufacturers. At the same time, we are the market leader for GE equipment. GECAS and our sister company, Shannon Engine Support, provides spares to all of GE Aviation and CFMI's customers. For example, GECAS has a significant investment in the newest technology LEAP 1A and LEAP 1B engines supporting the entry-into-service programme. These engines are also available for commercial lease. In time, that will prove a significant advantage because the LEAP engine is present on about two-thirds of new narrowbody aircraft. OEMs, through their maintenance agreements, are taking reliability responsibility, including spare engine provision, as necessary. This reduces the impetus for airlines to buy their own spares and makes the lessors' relationship with the OEM a key channel to market.

Looking ahead, we foresee some new entrants to the leasing business. As mobile assets with predictable returns and durable values, engines appeal to institutional investors, although new players should be wary of the daunting technical barriers to entry. Maintenance is a much more significant part of the value equation than it is in aircraft leasing and there are a vast array of engine builds and upgrades. Airlines today are also more willing to take risks with spares because of improved engine reliability and a deeper market for short-term leases. Overall, though, I welcome new entrants. They provide more funding options and increase liquidity, which are net positives for the engine leasing market.

To what extent have emerging markets taken off in recent years and is there a risk of over-heating in these economies' air travel markets?

Mike Jones, EVP, emerging markets, GECAS: It's difficult to overstate the importance of emerging markets to GECAS. We have 453 owned and managed aircraft with operators in emerging markets, which is about the same exposure we have to the US and almost twice our aircraft count in Europe.

Clearly, the market has its own characteristics and one must consider risks related to credit, jurisdiction and currency – to name a few – but we manage these with a very diverse customer base of 129 operators, versus just 21 in the US. To ensure quick responses and better understanding of those customers and their markets, we have 99 employees spread across many regional offices.

As in most other regions, low-cost carriers have stimulated massive traffic growth in emerging markets, with airlines such as Airasia, Indigo, Lion Air and Vietjet having a huge impact. Crucially, these and others are still getting more first-time passengers in the air, whereas in places such as Europe and the US annual traffic increases are more sedate. Accordingly, emerging markets have been a huge growth engine for GECAS over the years as we shift focus from the more mature regions to faster-growing ones.

Given that long-term growth in emerging markets is driven by demographics, a ballooning middle class and, still, a low ratio of aircraft to people, the potential for leasing in such regions remains enormous. Other factors include the relative paucity of alternative transport options and, often, a lack of land transport routes. Big risks remain, of course, notably currency volatility, yield pressures and infrastructure demands. Therefore, it's essential to understand local markets well – and we have 19 nationalities working in our Singapore office to do just that – but the upside and long-term potential cannot be ignored by any successful lessor.

Where do you see opportunities in Europe and Canada, and how much difficulty have airline bankruptcies plus Brexit uncertainty caused GECAS?

Declan Hartnett, EVP, Europe and Canada, GECAS: The past 12-18 months have seen a bit of turbulence for European carriers, notably a bankruptcy administration at Alitalia and failures at Monarch and Air Berlin. Bringing our technical abilities to bear in support of redeployment of our aircraft at Air Berlin and with their strong cooperation, we completed the transition and repositioning of our fleet there with alternate carriers in a remarkably short space of time. Given our belief there will be a flag carrier for a market as large as Italy and that with the appropriate ownership and cost structure Alitalia could be a very viable enterprise, GECAS is keen to see them succeed.

> *"We have 453 owned and managed aircraft with operators in emerging markets, which is about the same exposure we have to the US and almost twice our aircraft count in Europe."*
>
> **Mike Jones**, EVP, emerging markets, GECAS

While part of a natural evolution of the industry, these failures have led to others picking up market share, notably Lufthansa, Easyjet and Ryanair. Europe appears to be approaching its next big round of consolidation with all three of its big network airline groups – Air France-KLM, Lufthansa and IAG – positioning themselves accordingly. The result might be greater customer concentration for GECAS in Europe, but consolidation also benefits us since we are one of only a few lessors with the scale and product choice to meet all the requirements of massive carriers.

Changes are a natural part of the industry, but with the scale, expertise and relationships we've developed at GECAS, we're able to support our customers to promote the best possible outcomes regardless of the situation.

That said, Brexit remains a worry because time is running out for negotiations and a no-deal scenario would cause extraordinary disruption to UK flights and Airbus production. However, I think the industry is confident that some form of aviation arrangement will be reached – the alternative is almost inconceivable!

How are Chinese operators meeting passenger demand and what obstacles to growth do recent geopolitical tensions pose in the country?

Li Liu, EVP, Greater China, GECAS: China has been a growth engine for the leasing industry for many years and its airlines account for about one-quarter of GECAS's leased portfolio. Although traffic is not increasing at quite the rate of a decade ago, in recent years China's airline sector has still boasted doubled-digit growth that is the envy of most other countries. This is great news for lessors, although competition for deals remains fierce.

Many of the new entrants to leasing are from China and most focus on leasing to Chinese airlines. Furthermore, most are backed by financial institutions with extremely deep pockets and a hunger to scale up their fleets rapidly. This combination has made it difficult for more cautious players who are taking a long-term approach to competing in the sale-and-leaseback market.

It is unclear how the current China/US trade dispute will impact the aviation market because the tariffs imposed by China have not yet impacted Boeing. What is certain, though, is that China will require huge numbers of additional aircraft in the next decades – demand that will be too high for Airbus to satisfy alone, even if supplemented by the Comac C919, which will need another few years to deliver. Therefore, it isn't feasible for Chinese airlines to rely on one source only; to grow they will need Boeing aircraft and the 737 Max in particular, and if China imposes a tariff it will only hurt its own airlines in the near term. That said, if the trade war doesn't stop, it will damage not only Chinese airlines but also Boeing and other American OEMs because China is sure to remain one of the world's largest aviation markets.

Where are the main opportunities for GECAS in the highly developed US market?

Chris Damianos, EVP, US, GECAS: The US is a very mature market and while growth is not as aggressive as in other regions, given the scale of the overall US fleet even an incremental rise from the base is meaningful. It creates significant demand and provides opportunities to keep lessors very active. As the largest lessor in the US, with more than 450 aircraft positioned with most of the operators and a history dating back more than 30 years, our footprint is substantial. The GECAS track record and credibility is noteworthy and one which airline operators look to for certainty of execution.

Not only does our new orderbook support the fleet needs of airlines, but also our long-term relationships provide us insight into the specific requirements of each operator and the opportunity to provide customised solutions that truly meet their needs as those needs evolve. With rising fuel prices, for instance, we're detecting a growing appetite for new aircraft from US airlines and we're well placed to meet that with our big orderbooks for re-engined Boeing and Airbus narrowbodies.

In contrast, until about a year ago a feature of the US market was demand for mid-life aircraft as airlines sought to fill capacity gaps at lower lease rates and take advantage of relatively low oil prices. GECAS classifies about one-third of its narrowbody fleet as mid-life, which matches up pretty well with the number of US-based narrowbodies in the same bracket.

Despite recent trending towards newer models, mid-life aircraft are still popular and we welcome opportunities to acquire them. If airlines want to shed 12-year-old narrowbodies to replace them with newer aircraft then we are very interested in picking up any well-maintained 737NGs or A320s. Once you refresh the interior and the aircraft has the latest IFE [in-flight entertainment] and wi-fi, it becomes a great value proposition for airlines.

It works for us, too, because we have various end-of-life options that offer reassurance for residual values. Our subsidiary, Asset Management Services, supplies the booming market for used serviceable material, and they tell me there's not enough end-of-life aircraft on the market to keep them satisfied. Another outlet for mature equipment is freighter conversion, which can feed further lease revenues because GECAS is the world's biggest lessor of freighters.

How much momentum is left in the growth of low-cost carriers (LCCs) in Central and South America and what factors might constrain the development of these LCCs?

Luis Da Silva, SVP, Latin America and Caribbean, GECAS: In Latin America there are two different dynamics at work. Brazil and Mexico have well-established low-cost sectors where LCCs account for the majority of departing seats. Given the size of those countries it's unsurprising that Gol and Azul in Brazil, as well as Volaris, Interjet and Viva Aerobus in Mexico, are among the biggest and most successful LCCs in the region. Meanwhile, in Colombia, Peru, Chile and Argentina a new wave of start-ups is following the ultra-low-cost model pioneered by the likes of Spirit in the US. These include Wingo in Colombia, the Viva group in Colombia and Peru, Jetsmart and Sky Airline in Chile, and Flybondi in Argentina. European carrier Norwegian also plans to start operations in Argentina.

The business case for these airlines rests on the fact that air travel in South America is still expensive compared with other parts of the world. Yet its growing middle class wants and needs affordable air travel because of their own aspirations and the huge distances between major population centres. Until now many have relied on long-distance buses – there isn't much rail infrastructure – but the new wave of airlines is trying to tempt them off these by offering comparable fares.

All the new ultra-low-cost carriers have big ambitions, but some are still to start operating while others only have a handful of aircraft. If they are going to become a significant demand source for aircraft they will have to overcome multiple challenges in the region. Airport infrastructure is limited and most of the most popular airports are slot-constrained. On top of that, there are very high departure taxes and fuel levies, which limit their ability to cut fares and stimulate new business.

There is no open-skies policy in the region either, which presents another hurdle – liberalisation in Europe underpinned the massive success of LCCs there and Latin America would greatly benefit from something similar. Another concern is currency fluctuations, which can be hugely damaging for a new operator's bottom line, especially because they tend to rely on leased aircraft paid for in dollars.

What about the big picture: how do the nuances of each regional market combine to inform GECAS about global aircraft demand through the next decade?

Burger: I don't expect any problems finding leasing customers for our aircraft. Airlines across the board look strong and demand for aircraft remains solid. Our current portfolio and orders are for the most in-demand new-technology aircraft that have a large customer base. On top of that, our success and longevity in the industry has been — and will continue to be — the domain expertise of our team.

GECAS wins deals by leveraging its relationships, focusing on larger tenders our competitors can't win, and using our key advantage of breadth of service. Nothing will change in those respects.

Cyber resilience – prepare, withstand and recover

Cybercrime is on the rise, and so is the amount of money being spent to combat it, write Kieran O'Brien, Mike Daughton and Tony Hughes of KPMG in Ireland.

"Why would anyone want to attack us, we are an aviation leasing company?"

Your perception of cyber security is very different the day after an incident than the day before and that is why this question has been asked when sitting opposite clients in the aftermath.

Globally, just over two in five chief executive officers (CEOs) say they feel prepared for a cyber event. With spending on cyber security products expected to top the $113billion mark by 2020 and reports of data loss making the headlines almost daily, why in the age of mature cyber security products do large-scale breaches continue to happen?

Cyber criminals are employing tools of an increasing complexity and deploying them in an ever more sophisticated manner, using the same enterprise levels of organisation, artificial intelligence and machine learning solutions that security professionals aspire to possess. The emergence of super strength encryption on readily available communication apps and the layered security model of the dark web, hosting online stores for criminal goods and services means that the potential for detection has decreased dramatically. Cybercrime has now overtaken traditional crime as the key enabler of fraud, and with the value of financial transactions in the aviation leasing industry this makes it a lucrative target for cyber criminals.

The prevalence of point and click cyber weapons, loaded with an array of ransomware, phishing and compromised networks used to deploy denial of service attacks, are easily and cheaply obtained on the dark web. The means to effect those attacks is becoming easier and, in many cases, free of charge to the attacker.

A Distributed Denial of Service attack can be hired for as little as $7 an hour, with the costs of mitigation estimated at more than $100,000 an hour, incredibly this makes the cost of performing an attack similar to that of going to see a movie.

This has created a lucrative gun-for-hire marketplace on the internet. Distance, time of day or innocence of the target has no relevance, if the price is right and a return on investment can be realised. Making money is the real motivation behind current cyber-criminal activity and answers the question, "why us?"

According to Verizon, which analysed 42,068 incidents and 1,935 breaches from 65 organisations in 84 countries, 51% of breaches involved organised criminal groups.

Attacks can be focused, where you are of interest to an attacker because of the value of your business transactions, or simply you could be the victim of a scatter-gun approach, where you are the consumer of an IT product or service that has been compromised because of poor security design, or is reaching end of life and can no longer be supported.

Kieran O'Brien, head of aviation finance and leasing advisory, KPMG in Ireland

The cost of defence has escalated over time, usually as a reaction to a high-profile event. Typically, spending on cyber security now outpaces operational IT at a ratio of seven to one, an unsustainable strategy.

Firms are coming under pressure to contain their burgeoning cyber security budgets, and there is an opportunity to look at the business holistically. Doing so would ensure that expenditure is focused on the true risks posed to their digital assets, rather than procuring multiple layered technical solutions (which ultimately no one entirely understands) to plug perceived security gaps.

Embracing emerging technology, and adopting maturing services such as Cloud, allows us to innovate and transform our business but requires the consideration of cyber security as an essential business operation.

The challenge is transforming our cyber security position from a basic one, to a more mature model while doing so in a timeframe that avoids obsolescence. As the aviation industry increasingly delivers and receives services via digital channels, cyber security by design and by default is a requirement. This is a core concept in transforming business in a rapidly changing environment.

Global Leaders in Aviation Finance

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Mike Daughton, risk consulting partner, KPMG in Ireland

In the 2018 KPMG CEO Outlook report, *Disrupt and Grow*, almost half of the CEOs consulted (56%) believe they need to do more to combat cyber security "fatigue" in their organisation.

The apparent failure to identify explicitly and manage risks around cyber security, while noting the need to embrace emerging technology, might suggest a potential misdirection of effort, and resources, when dealing with the risks and opportunities around the application of technology within the business environment.

It is possible that the current approach to securing our technology has not fully lived up to expectations and that no magic bullet or box exists to solve the end-to-end multidirectional attack vectors employed with ever more efficiency and effectiveness by the modern cyber-criminal.

Cyber security professionals have repeated the "defence in depth" mantra for well over a decade, and the current theme is focused on the people, process and technology aspects within the cyber ecosystem.

Evolving from those traditional models is a different way of considering the overall approach to securing our assets, designed to reduce the risk of a hit whichever direction it comes from - this approach is called "cyber resilience".

Cyber resilience is being able to prepare for, withstand, rapidly recover and learn from deliberate attacks or accidental events online. Cyber security is a key element resilience, but cyber-resilient organisations recognise that operating safely in a digital environment goes far beyond just purely technical measures. By building an end-to-end understanding of cyber risks and threats, and aligning them to business objectives, they are able to take the appropriate measures to protect their digital assets and maximise the opportunities available online.

Cyber resilience also creates opportunities to increase the security awareness of staff, management and the board to reduce their riskier behavioural elements, creating a clear line of sight between business objectives, and digital strategy and cyber security implementation.

The questions lessors have asked is, how can I implement cyber resilience in practice?

Cyber resilience is a process of continual refinement and relies on organisations understanding the quantity, sensitivity and location of the assets to protect. The new General Data Protection Regulation (GDPR), effective from 25 May 2018, has mandated this approach to information asset management on EU citizens' personal information.

Our experience with aviation leasing clients in implementing processes to support GDPR highlighted the effort required to meet basic compliance; but the result, a much stronger position with regard to their data management and protection of information assets. A similar approach to cyber resilience is required.

The process for achieving cyber resilience is a framework containing five pillars: identify, protect, detect, respond and recover. You evaluate each pillar against your organisation's cyber security strategy to reduce the risk of adopting a static security posture in an ever evolving threat landscape; and ensure that business rules continue to be applied in the way they were designed, via the use of technology.

By evaluating the risk posed by each weakness and which are the most critical, you should be able to improve your preparedness for an attack, including managing and focusing spending on protecting crown jewels. With each scheduled cycle of assessments, the security strategy is re-evaluated, and since every organisation has unique systems and different security needs, the results of each series of assessments is measured against the current threat environment and the acceptable risk level for the organisation, rather than a relatively generic series of standards and checklists.

Often our discussions on cyber resilience with our aviation-leasing clients are targeted at board level because it is ultimately accountable for managing the risk.

Therefore, from a board perspective, it is important to de-mystify the concept of cyber security and how it relates specifically to an aviation-leasing client. One size will not fit all; however; every client, regardless of size, can take steps to help identify and respond to an incident. Technical support, or software-based solutions, are only part of the answer, and clients of all sizes seek advice on how to identify and respond to the risks posed to their assets from both cyber criminals and non-malicious actions – specifically centred on people, process and technology.

Our message to clients is that cyber security is a number of things executed effectively, so where can I start, or continue the journey to cyber resilience?

Practical steps which a board can take to help support cyber resilience

As a starting point, board members should consider the following areas of focus – a number of steps can be taken with minimal incremental cost, beginning with a cyber-focused risk assessment:

1. **Identify critical assets**: both key systems and information assets. It is essential to understand what we are trying to protect and make investment decisions on cyber defence based on the most critical assets.
2. **Risk assessment**: a risk assessment will help to

understand how the threats to our assets are currently managed and identify/prioritise further mitigating actions, while ensuring ongoing focus on the issue at board level. For key systems and information assets, consider the arrangements in place over access; backup; technical support; business continuity and protection against attack. Consider who might be interested in disrupting these systems, or stealing your data. An informed risk assessment will help build effective defences. Data leakage via hacking, phishing and other social engineering attacks would provide a criminal gang the capability to misrepresent your company, allowing them to change standing financial data such as bank account details thereby redirecting legitimate payments or creating fictional invoices against your assets.

3. **Incident response**: consider how critical identified key systems are to your business and, in the event of an attack or disruption, how quickly you would seek to restore them – critical systems should be prioritised. Develop (and test) an incident response plan, which can be enacted in the event of an attack. This will help to ensure that the appropriate personnel (within the organisation and outsourced technical support) are quickly engaged, and that priority is given to isolation (and restoration) of key systems. The minutes and hours after an event are critical. Be prepared.
4. **Review your own general IT control environment**: from maintaining up-to-date policies and procedures, through to regularly reviewing access and user rights to the network and key applications. Consider limiting the use of removable media – all laptops and removable media should be encrypted and regularly scanned for malware.
5. **Staff awareness**: staff are a critical element of cyber defence, particularly in relation to attempts at cyber fraud or theft, phishing, data theft or corruption or transmitting malware. Ensure they understand corporate policies covering acceptable and secure use of IT equipment. Encourage them to think twice before opening an unsolicited email attachment, or acting on unusual requests (even if they appear to be from senior management).
6. **Network security**: seek support from IT specialists to ensure robust network access protocols (including user/device authentication) and defence, such as firewall, antivirus and anti-malware. All systems and networks should be continuously monitored for unusual activity or attempted/actual attacks.
7. **System updates and security patches**: ensure that system software updates and security patches are processed as they become available. These are often issued by software providers to address known vulnerabilities or threats. Cyber attackers often exploit known system vulnerabilities; timely application of system updates is essential.
8. **Data management**: cyber attacks often target company data, either to corrupt it, steal it, or demand a ransom. The GDPR (effective May 2018) has heightened awareness of the importance of robust data management and places a significant additional burden on companies in relation to any personal data they hold. All companies should take stock of their data-management policies, procedures and processes (and, indeed, only hold essential data), and reinforce controls to ensure secure data storage.

Tony Hughes, associate director cyber security services, KPMG in Ireland

9. **Use of cloud-based services**: many companies are choosing to outsource their systems and data to third parties. While this has many potential benefits, care should be taken to obtain assurance from third-party providers (with their obligations being embedded within contracts), particularly with regard to business continuity, security of systems and data, and timely reporting of any attempted security attacks.

The five pillar model is consistent with the EU Directive on Network Information Security, in the US via the National Institute of Standards and Technology and by the UK National Cyber Security Centre in their 10 Steps to Cyber Security approach, employing a number of key building blocks proportionate to all sizes of organisation, with an end-to-end continual assessment of each activity clearly described.It is also the approach utilised by KPMG in delivering cyber security services to our clients.

We define cyber resilience in six core interdependent domains:

- cyber governance;
- privacy management;
- asset management;
- access management;
- technical control; and
- incident response.

With the right governance structures and processes, information and appliance asset management, identity access management for customers and staff, technical measures to protect network boundaries and gateways, and response plans that are effective when needed, an organisation can consider itself to be resilient in the face of cyber risk.

Jolco rides the wave

The Japanese operating lease with call option goes where banks fear to tread. By Caroline Devlin, partner, co-head of tax and leasing, and Laura Cawley, associate, aviation group, of Irish law firm Arthur Cox.

After a dip in popularity during the economic downturn, the Japanese operating lease (Jol) and Japanese operating lease with call option (Jolco) structures continue their rise. It is perhaps obvious because they offer up to 100% financing to airlines, and produce an attractive internal rate of return to investors with interesting tax allowances, a level of finance which is beyond the appetite of banks.

Both new and traditional airlines are using this financing arrangement, and it is becoming increasingly popular in Asia, including with airlines with no Japanese routes.

Jolco structure – tax considerations

From the Irish perspective, the fact that the Irish lessor does not own the aircraft does not present any particular Irish difficulties, and Irish lessors are frequent users of Jol/Jolco structures. Looking at the Irish tax position, it is not necessary that an Irish entity owns an asset in order to obtain tax depreciation (or capital allowances). Rather, the allowances are given to the entity that bears the burden of wear and tear.

Also, there is no Irish withholding tax on rent (or interest) paid from Ireland to Japan. While there is a double-tax treaty between Ireland and Japan, it is not required here, because there is no Irish withholding on aircraft lease payments in any event.

Interestingly, the treaty between Ireland and Japan permits a withholding of up to 10% on interest payments between the two territories; however, as a matter of domestic Irish law, Ireland does not levy withholding tax to recipients in double-tax territories. The same is not the case for payments of interest from Japan to Ireland.

Irish leasing companies are traditionally either trading companies – subject to tax at 12.5% on their net profits, after all expenses and allowances, including capital allowances – or "Section 110 companies" which are technically taxed at 25% but, in practice, would have a negligible profit.

Irish companies will typically satisfy the substance requirements set down in BEPS (base erosion and profit shifting), and will have their centre of control and management in Ireland. It is increasingly common that airlines will be concerned to ensure that their lessor has the required level of substance, and is the beneficial owner of the rental income stream, in order to ensure that the airline can safely pay rent free from withholding tax in its own jurisdiction.

The Jol/Jolco structures do not impact on this analysis, because the Irish lessor will typically maintain the same level of substance and overview of its portfolio, whether financed through a Jolco or otherwise.

> *It is not necessary that an Irish entity own an asset in order to obtain tax depreciation or capital allowances.*

Part of the attractiveness of the Jolco is the tax allowances available under Japanese tax laws. As with any product that derives value from tax breaks, the sustainability of the Jolco is, to some extent, dependent on Japanese tax rules, and rules can change. This is relevant when considering how the risk of tax changes is to be shared between the parties, whether funding might terminate early, and what inventive solutions might be found should a change occur. However, it is clear that the structure is well known to legislators and, for the time being, enjoys popularity. In any market, this can seem like a lifetime.

Aircraft mortgage registrations

The aircraft mortgage will generally be considered to be the primary protection available to a creditor in the senior secured portion of the Jolco financing transaction.

In taking an aircraft mortgage, the creditor will be mindful to ensure that it procures the most robust protection in each jurisdiction that the aircraft, the owner and the lessee are operating in, subject always to the commercial realities of each particular transaction.

As in a Jolco, the owner of the aircraft is generally located in Japan, so in the interests of certainty, familiarity and speedy accessibility to remedies and enforcement mechanisms, it would generally follow that the aircraft would be registered in that jurisdiction.

An aircraft mortgage in Japan will be registered with the Japanese Civil Aviation Bureau (JCAB), which is a department of the Ministry of Land, Infrastructure, Transport and Tourism in Japan. The JCAB aircraft registry is open to the public. (In the case of an equivalent Irish company granting a mortgage over an aircraft, details of the aircraft mortgage would also be filed in the Irish Companies Registration Office, which is also open to review by the public.)

There is a two-step optional process to registration of the aircraft mortgage in Japan:

1. A provisional registration of the aircraft mortgage, which will secure priority; and
2. A full registration, which is required to enforce against the debtor which is more costly.

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In most cases, the provisional registration will be made as a matter of course, and if and when there is a real risk of default, the full registration will be made in order to support enforcement. The mortgage registration must disclose information on the secured obligations amount, the interest amount and conditions to the secured obligations which, given the increasingly competitive marketplace, is not ideal if this creates a scenario whereby other industry players can deduce the terms of lending from the publicly available registration document.

If the aircraft was owned by an Irish entity, the registration of the charge in the Irish Companies Registration Office will be made for a fee of €40 (¥5,210) and the particulars described can be limited to what is needed for a third party to identify the asset being mortgaged and the parties involved.

Significantly, Japan is not a contracting state to the Cape Town Convention (Ireland is), so a route to registration, other than the location of the debtor, would be required.

Priority of security

In Japan, whereas the full mortgage registration protects against third parties and gives priority over subsequent registered security interests, the typical provisional registration will give priority over subsequently registered security interests only, but full registration is needed for the mortgage to be enforced.

The registration in the Irish Companies Registration Office will give priority over a liquidator and any creditor of the company which will run from the date of registration. Any mortgage registered ranks ahead of any mortgage or charge subsequently registered; however, a registered mortgage will not take priority over a possessory lien for work done on the aircraft, whether before or after the creation or registration of the mortgage and also any rights of detention (for instance, unpaid airport charges, air traffic control charges and Eurocontrol charges).

The international registry filings of course rank priority on a first-to-file basis, unless this is amended by subordination, which can only be achieved with the consent and knowledge of all parties which have a previously registered interest in the aircraft. This is the case, even if the first registered interest holder has knowledge of an existing unregistered interest. The international interest in the aircraft mortgage will be effective even if it is registered prior to the debtor's insolvency, although the timing of insolvency will be determined by the relevant jurisdiction.

Enforcement of security

Enforcement in Ireland is, on the face of it, more straightforward and appealing to the creditor. In the first instance, the legal aircraft mortgage in Ireland can be enforced without intervention from the court. The concept of "self-help" prevails under domestic Irish law, whereby, in essence, on an event of default under a mortgage, the creditor can take possession of the aircraft (or appoint a receiver to do so) without judicial intervention and subsequently sell the aircraft, provided this has been specified in the mortgage document or elsewhere in writing.

In practical terms, the creditor can go to court where the debtor resists repossession or where there is a dispute about whether there has been an event of default.

In reality, however, a court order will be sought for the purposes of certainty of title on resale of the aircraft. The Commercial Court in Ireland offers speedy court remedies.

In Japan, the creditor will need to perfect the registration of the aircraft mortgage in the JCAB, and pay the debt-geared fees as a prelude to enforcement.

Also, in Japan there is no concept of self-help. Unless there is cooperation between the lessee and the owner, the creditor will need to commence a court procedure to enforce the aircraft mortgage by way of public sale supervised by a court (a court sale).

Where there has been a filing of the international interest constituted by the aircraft mortgage in the International Registry, there are significant pro-creditor remedies that can be utilised – such as taking possession of the aircraft without obtaining a court order, deregistering and exporting an aircraft by exercising rights under an irrevocable deregistration and export request authorisation, selling or granting a lease of an aircraft object, collecting or receiving any income or profits in connection with the management or use of the aircraft and obtaining interim relief pending final determination of any claim.

In addition to these, the election of Alternative A under Cape Town in Ireland now allows, where there is insolvency, the creditor to take possession of the aircraft, if the debtor defaults and fails to perform its obligations under the aircraft mortgage for 60 days.

The limitations to the legal aspect of enforcement of an aircraft mortgage in a Jolco transaction may never come into play because once the aircraft is located outside of Japan, this jurisdiction can be relied on for enforcement and if this jurisdiction is a Cape Town Contracting State, the protections under the convention will become available.

More Japanese investment to come

Despite some of the potential hurdles described above, which can generally be structured around, it is clear that the Jolco is only increasing in popularity. High tides carry all boats, or perhaps aircraft even, and the strong steady flow of funding through Jolcos facilitates the growth of both airlines and lessors, while giving a Japanese investor tax advantages and access to the attractive aviation industry.

Although there was a reported slowdown in the Japanese market in the first quarter of 2018, GDP rose in the second quarter. The economy is projected to reach growth of 1.25% in 2018 and growth is projected to remain above 1% through 2019, according to the OECD Economic Outlook, Volume 2018 Issue 1.

These figures suggest there will be increasing Japanese equity investment available in the market. Any uncertainties over global trade tensions or the outcome of the Brexit negotiations are not obvious here.

Aviation in India – a constant change

By Nimish Vakil and Sneha Rao, partners at Mumbai law firm Tyabji Dayabhai.

India operates the third-largest domestic civil aviation industry in the world. The airline industry in India was nationalised in 1953 and the then existing independent airlines, Deccan Airways, Airways India, Bharat Airways, Himalayan Aviation, Kalinga Airlines, Indian National Airways, Air India and Air Services of India, were merged into two government-owned corporations – Air India, which focused on international travel, and Indian Airlines, which operated on domestic routes.

The civil aviation sector in India was deregulated in 1991 to allow private carriers to carry on charter operations and non-scheduled services. East-West Airlines was the first to benefit from the Indian government's open-skies policy. Post-1994, with private carriers being allowed to operate scheduled services, the aviation sector saw the birth of airlines such as Jet Airways, Air Sahara, Modiluft, Damania Airways and NEPC Airlines commencing domestic operations. Since 2004-05, low-cost carriers (LCC) such as Air Deccan, Air Sahara, Spicejet, Goair, Paramount Airways and Indigo have taken over the Indian skies.

East-West Airlines and Damania shut down in 1996-97 because of financial troubles. Modiluft, although one of the better managed Indian private carriers, could not sustain its German partnership with Lufthansa and ceased operations in 1996. The shareholding in the airline and the air transport licence changed hands and was renamed as Royal Airways and eventually became scheduled operator Spicejet.

In 2007, Air Sahara was bought by Jet Airways, Air Deccan by Kingfisher Airlines, and Indian Airlines merged with Air India. Cut-throat competition, rising fuel prices, heavy operational costs and unfavourable economic conditions had left many private airlines struggling, resulting in consolidations, takeovers, partial acquisitions and shutdowns.

In 2012-13, the aviation industry witnessed the dramatic downfall of Kingfisher Airlines, the airline which promised good times for everyone. Kingfisher had reported losses since its inception and the acquisition of the loss-making LCC Air Deccan further ate into the airline's capital. This was a classic case of mismanagement and lack of expertise in the aviation business.

During this period, the finance ministry cleared the way for the relaxation of foreign direct investment (FDI) rules, which permitted foreign carriers to take a stake of up to 49% in private airlines in India – private airlines are allowed FDI of up to 100% from other sources. This change in the policy allowed United Arab Emirates carrier Etihad Airways to purchase 24% of Jet Airways in April 2013, which is still the only FDI by a foreign carrier in an Indian airline.

In 2015, post the Kingfisher saga, low-cost carrier Spicejet, which was facing an operational shutdown because of a lack of funds, was resurrected thanks to a timely change of management.

Nimish Vakil

Sneha Rao

One of the major events earlier this year in the Indian aviation industry was the set back of the ambitious attempt by the Indian government to rescue the government-owned, loss-making national carrier Air India through divestment. Air India has been unprofitable since its merger with the state-owned domestic operator Indian Airlines. The airline is managing to stay afloat because of a Rs30,231 crore ($4.3 billion) nine-year bailout plan approved by the government in 2012.

The plans to divest were put into action last year because of the relaxation of FDI rules, which allowed Air India to look for other investors. The government put up Air India, Air India Express (its low-cost overseas carrier) and Air India SATS (the ground-handling arm) as one single company for sale with the hope of raising Rs8,000 crore to Rs10,000 crore. However, the proposal did not find any takers, mainly because the government did not offer 100% privatisation of the airline. Only a 76% stake was proposed for sale while the government retained a minority stake of 24%, which did not leave the option of a merger of the national carrier with the existing airline of the purchaser.

In addition, out of Air India's total debt of Rs48,781 crore, the purchaser would be saddled with Rs33,392 crore. Air India has accumulated losses of Rs50,000 crore and a major chunk of its revenues went in payment of interest of working capital loans. Some 40% of Air India's 27,000 employees were permanent staff, which posed a huge financial burden. The prime properties owned by Air India did not form part of the deal. After the setback, it is reported that Air India is battling aircraft grounding for non-availability of spare parts and a delay in salary payments. The government has asked the national carrier to sell off its non-core assets in a bid to reduce its debt burden.

Private Indian scheduled operator Jet Airways is also in crisis. Since the Indian skies were opened for private players, Jet has faced and survived quite a few turbulences. The carrier has been profitable twice in 11 financial years and had accumulated $447 million of debt through to 31 March 2018. The 25-year-old airline has reported a negative net worth and is facing a severe cash crunch. It deferred announcement of its unaudited financial results for the June 2018 quarter to August 2018.

Etihad's 24% shareholding has not been very profitable for either carrier. Etihad, which is dealing with strained finances because of its recent acquisitions, is unlikely to make further investments in Jet. At a time when the airline is trying to cut down costs severely and trying to raise funds by borrowing from domestic banks, soaring fuel prices and stiff competition are only causing it further financial damage.

There is no dearth of demand for air travel in India, with passenger traffic recording a 20% growth in the financial year ending 2018. The airlines' orderbooks speak for themselves. Indigo, the largest carrier in terms of market share, is looking to add a massive 448 aircraft to its fleet in the next eight years. Jet Airways has ordered 156 aircraft for delivery between 2018 and 2023, whereas Spicejet has 157 deliveries lined up for the same period. Go Air has placed orders for 119 aircraft over the 2018-2022 period, and Airasia is looking at adding 60 aircraft by 2023. Vistara is also likely to take 60 aircraft; however, it has not committed to a timeline.

The above statistics add up to an order total of 1,000 aircraft in the next eight years, and yet, aviation experts have projected that India will need to double that number in the next 20 years to absorb the growing demand. The airlines need a conducive economic and regulatory environment to sustain operations with such aggressive expansion of fleet size.

Regulatory relaxations favouring ease of international business, reduction in fuel prices, tax concessions for cutting down operational costs, infrastructural support in terms of construction of new airports, improvement of existing airports, provision of world-class maintenance, repair and overhaul facilities within the country will go a long way in supporting the airlines to survive the highly competitive aviation business.

TD

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Redeliveries – the picture in 2018

Lessors and Lessees have their say on the challenges of aircraft redeliveries.

IBA recently updated its analysis on overspends in aircraft redeliveries. They have increased since 2016, with engine costs being the key driver.

As a result, we thought it useful to update our 2016 pulse survey, where we canvassed a selection of lessors and lessees on five questions:

1. What is the primary reason for a late redelivery?
2. Which area of the aircraft is most challenging to redeliver on time and on budget?
3. Lessors, how often does the lessee engage too late in the process?
4. Lessees, how often do you find your internal teams engaged too late in the process?
5. What are the key issues that lessors face in 2017?

As part of IBA's continuing research into the challenges around transitions, we revisited these questions and added two more in order to capture changes in the market, or shifting sentiment:

6. What changes to end-of-lease trends in narrowbodies have you noticed in the past 12 months?
7. What changes to end-of-lease trends in widebodies have you noticed in the past 12 months?

In the previous report we received 72 responses, with a split of 65%-35% for lessors and lessees.

This time, we received an increased number of 140 responses, with a more even split of 53% lessors and 47% lessees. The key conclusions from the research include:

- both lessees and lessors agree that the redelivery process is not started early enough;
- records and engines top the list of the most challenging elements of a redelivery; and
- resource, liquidity and increased returns are key concerns in 2018.

We report on both the larger more recent datasets, highlight areas of note and recommend steps to maximise efficiency.

Question one: what is the primary reason for a late redelivery?

There are both positive and negative trends around the responses to the reasons behind late returns. Encouragingly, there is more awareness among lessees of the level of effort required than previously and there is also less disagreement over contracts.

A drop in disagreements certainly echoes the improvements to drafting that we have seen in the past two years. However, while ambiguous terms have reduced, there has been an increase in lessees' demands being met.

For example, delivery conditions for interior configuration being a lessor's obligation. For redeliveries, the top-tier lessees are able to negotiate diluted conditions, much less than half-life in some cases.

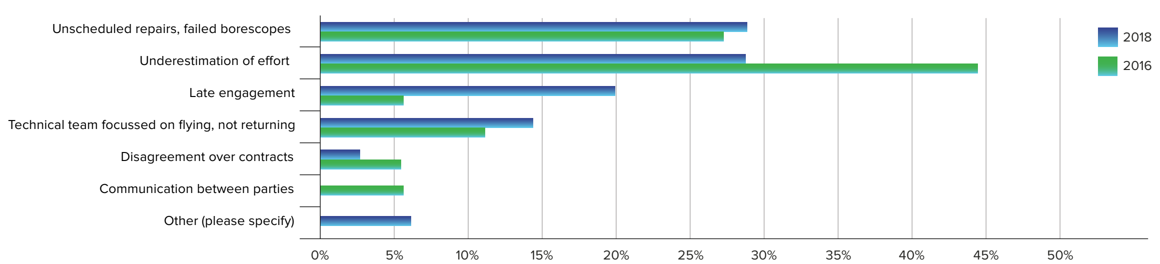
Less positively, engagement is still taking place too late. We recommend engaging around the options at least 15 months out, more if possible. Planning redeliveries late immediately makes the task of juggling numerous parallel processes more challenging. Unscheduled repairs and failed borescopes were identified once again as a primary reason for late redeliveries, suggesting lessees continued to be caught out.

As more operators build up or outsource dedicated redelivery resources, we were surprised that the feedback on the technical team focusing on keeping the fleet flying, not redelivering, had crept up a little.

Our view is that while mindsets do take time to adjust, the increased number of redeliveries has absorbed much of the additional resource. Anecdotally, the airline collapses of 2017 also caused a spike in demand for delivery and redelivery resource.

Also, there are big differences in what resource is available at an airline – clearly the low-cost carriers (LCCs) redelivering aircraft have much less manpower in-house than a legacy carrier. We anticipate further issues in this area, especially since some LCCs appear to be pushing the obligation onto their maintenance, repair and overhaul (MRO) and that causes conflict on points such as records/certification.

Question one: what is the primary reason for a late redelivery?

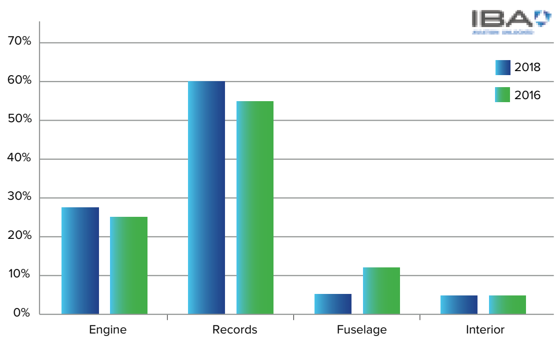


Question two: which area of the aircraft is most challenging to redeliver on time and on budget?

Here we saw very consistent findings compared with 2016. Records continue to be a primary challenge. The concept of lessors hiring cheap labour to scan records at the last minute is compelling but risky, and while systems and digitisation are certainly improving, translations and back-to-birth traceability are a perennial concern.

We were surprised to see that interiors and interior items did not generate more responses. In all IBA's recent redeliveries, interior condition was a point of robust negotiation, plus there are well-documented concerns around seat supply when looking at the next lessee's demands.

Question two: which area of the aircraft is most challenging to redeliver on time and on budget?



Question three: as a lessor, how often do you feel that the lessee engages too late in the redelivery process?

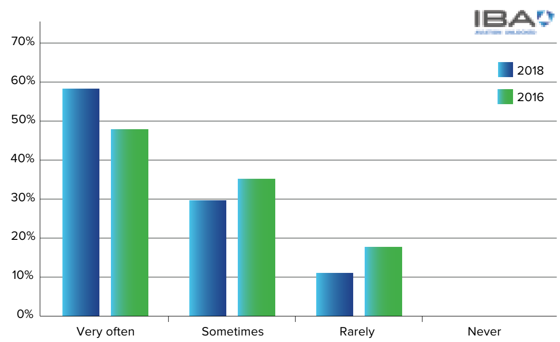
Again, very consistent responses with the previous survey, which was interesting given the increased sample size on this occasion. The results suggest very strongly that lessors feel lessees engage too late – indeed, the percentage of those responding "very often" has grown to almost 60% from 47%.

Question four: lessees, how often do you find that your internal teams engage too late in the redelivery process?

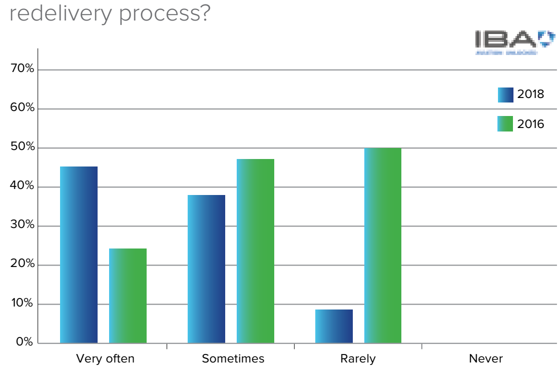
When asking the same question of lessees, we have seen a swing that suggests some lessees are much more aware of the need to engage early, but perhaps are not executing the early engagement as much as possible.

In the largest shift in perception between surveys, in the 2016 survey, about 50% of lessees felt they engaged early enough. However, as the chart highlights, in 2018, both parties agree that they need to engage earlier.

Question three: as a lessor, how often do you feel that the lessee engages too late in the redelivery process?



Question four: lessees, how often do you find that your internal teams engage too late in the redelivery process?



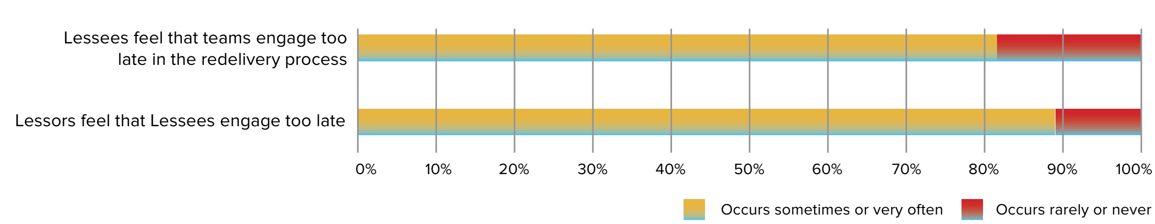
Question five: what changes to end-of-lease trends have you noticed in the past 12 months?

In one of our new questions, we asked what changes our respondents had noticed. While for 30% of narrowbodies and 50% of widebodies there were no changes, there were trends across extensions which we would attribute to the following:

More extensions, driven by –

- delays of Airbus A320neo/Boeing 737 Max deliveries as a result of entry-into-service (EIS) engine issues;

Question four: consistent views from both sides

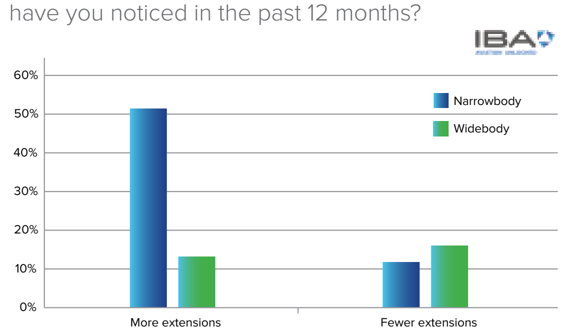


- continued relatively low fuel price, though this is tracking higher than forecast by the International Air Transport Association (IATA);
- regional instability, impacting demand and fuel price; and
- continued demand for capacity. Traffic growth remains robust and an extension can be achieved at a reasonable rate, especially on widebodies.

Fewer extensions –

- a worry for lessors because the options to find new homes is tough, despite deals being offered (for example, lower rents); and
- some regional distress – Qatar/Middle East and US competition.

Question five: what changes to end-of-lease trends have you noticed in the past 12 months?

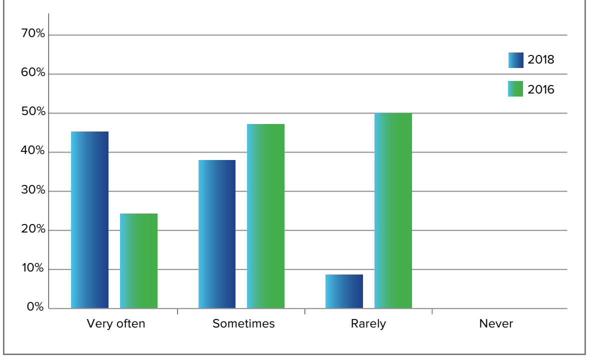


Question six: redelivery challenges

Our final question this year asked what redelivery challenges are being faced this year:

- some 94% of respondents foresaw a challenge. Insufficient lessee resource is unsurprising given the result from Question four;
- Maintenance, repair and overhauls (MROs) are flagged as a bottleneck by 19% of respondents; anecdotally, the MROs often say they are engaged too late by the lessees. Both points are merited when lessees do not involve MROs early enough, only to find that slots are already booked. We canvassed some MROs on the subject and several commented that they found the returning lessees to be reasonably organised for the end-of-lease (EOL) check. They were more frustrated when dealing with returning lessors which want last-minute changes to meet the next lessee's demands;
- lack of lessees – especially for widebodies – is a concern. We are seeing the return of used widebodies after the first lease, regardless of the extension offer; and
- while extensions have been the order of the day for the past two years, increasing returns combined with a lack of lessees would indicate increasing concern for liquidity and would also feed the slight, but noticeable, increase in disputes which can occur when a lessor receives an unplaced aircraft.

Question six: redelivery challenges



Conclusion

There are positive trends emerging from this year's survey – most importantly around awareness of the effort involved in redeliveries. One of the largest swings in results saw "underestimation of effort" drop considerably as a primary reason, an encouraging trend given the plethora of new entrants.

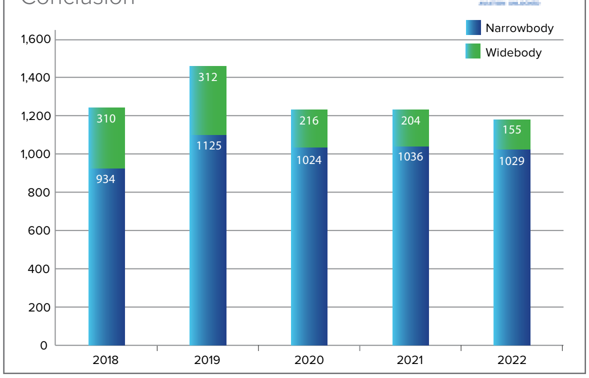
Adding to the increased understanding was a switch in lessee attitudes, moving from a majority perception that they engage early enough, to almost mirroring lessors in their view that lessees did engage too late.

As such, while an understanding of the effort has improved, execution of a redelivery still appears to challenge. Redeliveries continue to test both lessees and lessors, and we can split our conclusion into two areas to be aware of: one tactical, the other strategic.

Tactically, there are further improvements to be made in planning and resourcing redeliveries. Insufficient lessee resource, increased returns, scarce support from the lessor and insufficient MRO support accounted for more than half of our responses on 2018 redelivery challenges. Combine that with late engagement, the most frequently flagged reason for late redeliveries, and you have a perfect recipe for a likely overspend.

Strategically, there are potential red flags emerging around supply. Some 22% of respondents identified a lack of new lessees as a concern, a sentiment also voiced when asking for additional comments, where more concerns were flagged around liquidity than previously.

Conclusion



According to IBA.*iQ* and our analysts, the current picture does not yet suggest that more popular aircraft are failing to be re-leased, but we are continuing to monitor parked aircraft and re-lease rates carefully.

As of early May 2018, IBA.*iQ* indicates that the number of passenger widebody returns had reached 48, with two-thirds re-leasing within just a few months. It is unknown as to whether the remaining 17 have homes to go to just yet but their average age is 17 years old, while the fast movers averaged just 10 years.

Unsurprisingly, half of those that remain parked are four-engined aircraft, while the other half are made up of more challenging 777 classics and A330-200s. Encouragingly, those that have been re-leased include a good number of older 767-300ERs, a large number of A330-200s and -300s with even the odd 777-300ER and A340-600 for good measure.

Recommendations

IBA recommends the following steps:

Reducing execution risk –

- plan 15 months out for a narrowbody and more again for a widebody, with return conditions that require interior engineering as original equipment manufacturer (OEM), engagement and lead times will be 18-plus months;
- hire or outsource to plug gaps, a first lease narrowbody absorbs at least 120 work days resource, while a widebody and/or multiple lessee histories can more than double that;
- engage with the other side both to build a rapport and to agree lessor presence at EOL and redelivery check;
- run through each and every clause in the lease to identify:
  – what work needs to be planned in good time by the lessee to redeliver per the lease or
  – decide if there are certain items that can be "bought out"; for example, the lessee does not perform an engine shop visit for a full refurbishment, but the engine is accepted as is by the lessor, subject to cash compensation
  – mop up of lessor obligations to lessee such as air directive cost share payment and/or maintenance reserve payments;
- agree any ambiguous terms in the return conditions, if not already covered, and ensure the redelivery resource is acquainted with the specific return conditions;
- remove the risk of unscheduled repairs by booking early with MROs and carrying out precautionary borescope if at all possible, or question whether it is required if the engine is under a full support OEM programme;
- lessors, when you want the aircraft back, mitigate against lack of lessee appetite or experience in returning aircraft by encouraging early planning and visibility of red flag items, such as engine shop visits;
- greater focus on assets during operations. Lessors, make sure you utilise your inspection rights, particularly the penultimate annual inspection as per the lease plans for the lessee redelivery;
- plan for operational demands consuming redelivery resource; and
- ensure the records are in English, centralised, complete and correct.

Market risk –

- monitor values, availability and external events. The past 12 months has seen the unexpected return of A340s to service and the extension of older narrowbodies as EIS challenges continue;
- gauge lessor/lessee intentions as early as possible; and
- lessors, begin remarketing as soon as you know the aircraft is returning or before. Do not assume the lessee will execute a verbal intention to extend.

While any slowdown has not yet filtered through to our data, anecdotally we are aware of longer periods needed to find new lessees. ⋀

Top 10 contributors to transition challenges

1. Poor contract drafting on redelivery conditions.
2. Lack of lessee planning and early engagement with lessor.
3. Inadequate focus on assets during operations.
4. Lessee operational demands consuming redelivery resource.
5. Decentralised, missing or incorrectly completed records.
6. Underestimation of the total workload.
7. Discovery of additional work required during maintenance input.
8. Lack of lessor appetite for returned aircraft.
9. Engines failing final borescopes – carry out precautionary borescope much earlier.
10. Mismatch of current lessee redelivery conditions to next lessee delivery.

If you have any questions, comments or feedback, please contact: paul.lyons@iba.aero

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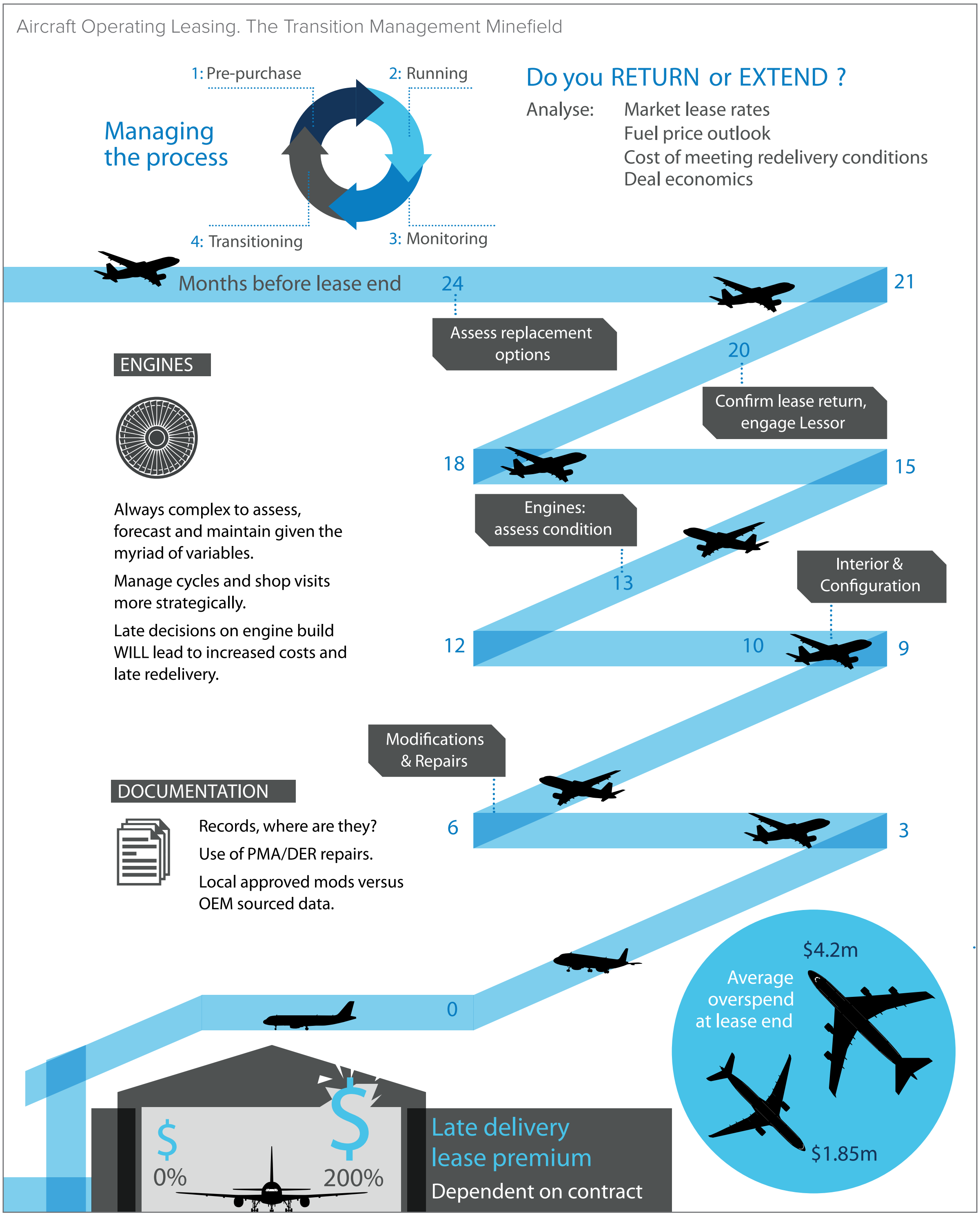

IBA is an award-winning and leading independent aviation consultancy advising a broad mix of lessors, operators, financiers and investors. Operating globally, we inform decision-making and support operations across the aviation spectrum. Supporting strategic investments, managing aircraft, advising on expansion, or driving efficiency improvements, our mix of intelligence gathering, analysis, proprietary data, technical expertise and decades of aviation experience delivers value across aviation opportunities and challenges.

Delivering creative regional aviation finance solutions to the world

Steve Ridolfi, president of Chorus Aviation Capital, discusses why regional aviation is so crucial to the industry, and his company's role in taking it forward.

Launched in January 2017, and not yet two years old, Chorus Aviation Capital has grown quickly to a fleet of 52 aircraft worth more than $1 billion. Chorus Aviation Capital was established to become a leading, global provider of regional aircraft leases and services by building a strong portfolio of regional turboprop and jet aircraft.

Chorus Aviation Capital is a subsidiary of Chorus Aviation Inc., a corporation with deep roots in the regional airline industry, including ownership of Jazz Aviation and Voyageur Aviation. By leveraging the expertise across the entire Chorus group of companies, Chorus provides its regional customers with a broad range of products and services.

Steve Ridolfi, president of Chorus Aviation Capital, leads a team with extensive experience in the regional aircraft leasing market. They are seeking to continue building growth momentum in this largely underserved market segment. They are intensely focused on prudent, conservative acquisitions that ensure long-term profitability.

Steve Ridolfi, president of Chorus Aviation Capital

Describe the regional market for us.

Ridolfi: Regional aviation is a surprisingly large and important component of global commercial air transport. It generally comprises airlines operating aircraft of 30 to 130 seats, which serve either as feeders to mainline airlines and hubs or as operators into smaller communities. As global air transportation has expanded, so has the need for regional aviation, especially in emerging markets.

Interestingly, and surprising to most, is that 60% of the world's communities are linked by regional aircraft and these regional aircraft fly 35% of the world's total commercial flights. The active regional turboprop and jet fleet is over 6,000 aircraft – about 25% of the world's total commercial fleet.

Who supplies the aircraft for this market and what is the forecast for deliveries?

The regional aircraft market is predominately supplied by three manufacturers: ATR, Bombardier and Embraer. The aircraft currently in production are generally in the 70- to 130-seat class, divided into the turboprop and regional jet segments.

In turboprops, the ATR72 and the Q400 share the market, with the ATR product having sales leadership over the past few years. ATR still produces the smaller 48-seat ATR42, but this aircraft is more of a niche product today. These two manufacturers also dominate the in-service turboprop fleet with the classic Bombardier Dash 8 family (100/200/300) and the legacy versions of the ATR42/72 still heavily utilised.

In regional jets, Bombardier manufactures the CRJ family while Embraer produces the E-Jet family. The Embraer family has greater product span and a broader customer base, but the CRJ family is a well-respected, efficient and ubiquitous regional aircraft. In a similar vein as the turboprops, older versions of the CRJ, such as the Series 200, and the legacy ERJ family help these two manufacturers dominate the regional jet in-service fleet.

Deliveries for regional aircraft have been stable at about 250 aircraft a year for the past decade with very limited volatility in supply and demand. Future forecasts for demand trend a little higher than the historical number, about 350 units a year, based mostly on the introduction of larger regional aircraft.

What led Chorus Aviation into leasing?

We believe that there is a significant opportunity to develop a large and profitable leasing platform to serve the needs of our customers, leveraging our unique expertise in the regional airline market. Chorus has deep roots in this market, being the parent of Jazz Aviation, the primary provider of regional airline services to Air Canada. Jazz operates a fleet of 116 regional aircraft under a capacity purchase agreement with Air Canada. Jazz serves lower-density markets as well as higher-density markets at off-peak times throughout North America.

Jazz also operates Jazz Technical Services, a division dedicated to heavy maintenance, repair and overhaul of Bombardier aircraft. Chorus also owns Voyageur Aviation, a specialised contract flying operator and a provider of aircraft manufacturing, maintenance, component parts and engineering services.

In early 2017, Chorus formed Chorus Aviation Capital using this deep regional market expertise to acquire, finance and lease regional aircraft. We see this very exciting opportunity to fulfill the needs of regional airline customers by delivering creative financing solutions in this underserved market space. We believe we can build a leading market lessor and create significant synergies with Chorus's other businesses.

How have you done so far?

We are very happy with what we've accomplished, and we're really pleased with the quality of the portfolio. We've announced transactions for 23 third-party regional assets with current market values well in excess of half a billion dollars. These include six different aircraft types from three manufacturers with an average age at acquisition of 2.7 years. When you add to this the 29 Q400 aircraft that were transferred by Chorus to seed the Chorus Aviation Capital portfolio, our portfolio stands at 52 aircraft worth more than $1 billion.

Our clients (including Jazz Aviation) now totals 10 major regional airlines in 10 countries on six continents, with Azul Brazilian Airlines, Aeromexico Connect, Air Canada, Air Nostrum, Cityjet, Ethiopian Airlines, Falcon Aviation Services, Flybe, KLM Cityhopper and Virgin Australia. We have a locked-in lease stream with an average term of greater than seven years, and we've financed all of these aircraft using bilateral debt at attractive loan-to-values.

On the organisation itself, we've expanded our management team in Ireland with a great group of individuals with significant commercial aircraft leasing experience. Overall, it's been an exciting and fun 18 months.

"We've announced transactions for 23 third-party regional assets with current market values well in excess of half a billion dollars."

What are the advantages in being in the regional aircraft leasing market?

With our deep knowledge of the regional airline market, Chorus Aviation Capital provides innovative leasing solutions for our customers. Our motto is: "Delivering creative regional aviation finance solutions to the world." The regional leasing market is a niche – albeit at 6,000 aircraft, a fairly large one – which requires experience and expertise. It provides ample opportunity to be rewarded in terms of yield and return. Further, because it is not fully mature, and consists of a number of smaller competitors, it certainly lends itself to rapid scaling and potentially consolidation.

What is your strategy in leasing?

We have a series of strategic goals and investment principles that drive our actions. As examples, we are focused on bringing on board new or mid-life aircraft that are currently in production and occupy the 70- to 130-seat class. We generally exclude smaller regional aircraft, 50-seaters for example, or aircraft that are generally more than 10 years old. Unless there is a synergistic opportunity for another company in the Chorus Group, we will maintain a young fleet with the newest technologies, as this is the best risk and financing profile for our business.

Our strategy is to diversify both our product and geographic footprints. We have, over the past 18 months, bought six different aircraft types from all three manufacturers. These aircraft are leased to nine new customers on six different continents. We are creating

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chorus aviation capital

our portfolio to be consistent with the global addressable market. Another example is our preference for leases with long tenures. We consider ourselves buy-and-hold lessors in that we will look to keep the asset until the end of term and even favour a re-lease opportunity ahead of a trade.

Of course, we have hurdle rates and lease characteristics that we analyse and review with every transaction. Hurdle rates include yield, cash flows, deal multiples, levered and unlevered returns. Lease characteristics include deposits, reserves, return conditions, tenures and financing.

We are seeking to continue to build on the growth momentum that we've established, but we are not looking to compromise on our investment principles to achieve this growth. We are intensely focused on prudent, conservative acquisitions which ensure long-term profitability. The good news in the regional market is that we see a lot of opportunities, a lot of potential transactions and we can be very selective.

What are the sources of aircraft acquisitions?

We have acquired portfolios both from other lessors and from sale and leasebacks directly from the airlines. Generally, we have been able to acquire regional aircraft from lessors where they considered these regional aircraft non-core to their strategy. An example being a mainline lessor that perhaps had acquired its regional portfolio as part of a package acquisition.

Many of our acquisitions have come directly from sale and leasebacks with an airline using our relationships within the industry. These tend to be new or nearly new aircraft that the airline has chosen to acquire through a long-term operating lease. We have not yet placed any skyline orders directly with the manufacturer but we anticipate this will be a third-source stream in the future.

How hard has it been to find financing?

We've been quite successful to date as our preferred method, bilateral debt financing, is quite straightforward and our partner banks fully understand our position in the market. As time passes, and as we continue to demonstrate our ability to grow and manage the business, we'll look to other financing options. As may be expected, we are in active discussions on alternate financing structures to support future expansion.

Is regional aviation geographically diverse?

Regional aviation is becoming more and more geographically diverse as the same trends of globalisation and emerging markets that drive mainline growth take hold on the regional side. While it is true that the largest regional airlines can still be found in North America and Europe, the greatest expansion, very rapid expansion I may add, is to be found in developing markets.

Does this make regional aircraft good assets to lease?

Yes, regional aircraft are, in many ways, ideal lease assets. Their inherent market is very stable and, as we've seen, a critical component of air transportation. Smaller communities are dependent on these aircraft for their economic linkage to larger cities and, many times, they substitute for mainline jets in off-peak circumstances. Hence, this market has demonstrated its resilience to downturns. During the world's financial crises, the regional fleet showed little volatility, dropping much less, and recovering much quicker than the mainline markets. Regional aircraft hold their value well over time, with strong residual values and little risk of technological obsolescence. These characteristics make regional aircraft ideal lease assets.

So, why is the regional leasing market underserved?

Two reasons – one historic and one practical. Historically, the commercial aviation leasing market grew, over the past three decades, from low single digits to about 50% today. Uniquely though, this growth did not occur in the regional market. Growth capital for regional airlines came from a very different source, the export credit agencies (ECA).

The regional aircraft manufacturers, and at one point there were six or seven of them, were all strongly supported by their national governments through ECA financing. This had the effect of keeping many of the leasing companies from venturing into this space. With the Aircraft Sector Understanding, the playing field was levelled. Regional airlines' need for growth capital is just as strong, if not stronger, than mainline aircraft, but for this significant historical reason the field is underserved.

On the practical side, the regional aircraft market is different from the mainline market. Lessors deal with a very different customer set with different needs and capabilities. This airline base is smaller, about 200 airlines, and leasing solutions are more bespoke and relationship-driven.

Assets come in smaller quanta, $20 million versus $100 million, thus creating a distinct niche perspective. All these parameters result in barriers to entry, again keeping the market underserved.

What does the future look like for Chorus Aviation Capital?

We believe there is a significant opportunity to develop a large and profitable leasing platform, to serve the needs of our customers by leveraging our expertise in the regional airline market. Our plan is to continue the growth momentum we've established in this segment by balanced, prudent acquisitions that build long-term profitability. We look forward to continuing to build a leading regional aircraft lessor.

Steve Ridolfi is president of Chorus Aviation Capital, a regional aircraft lessor and wholly owned subsidiary of Chorus Aviation Inc. Ridolfi previously served as senior vice-president of strategy, mergers and acquisitions, president of business aircraft, and president of regional aircraft, all for Bombardier. He has had a long and distinguished career in aerospace, beginning in engineering and advancing through various leadership positions in research and product development, airline network analysis, manufacturing and operations, customer support, and marketing and sales.

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Airasia portfolios help FLY transition to new-technology aircraft

FLY Leasing has closed one of the largest portfolio deals likely to be seen this year, acquiring a portfolio of up to 75 aircraft from Asia Aviation Capital.

The FLY Leasing-Airasia transaction, announced in March, involves two narrowbody portfolios that will give access to 41 latest-technology aircraft as the lessor moves towards the Airbus A320neo and Boeing 737 Max-family types.

FLY Leasing chief executive officer, Colm Barrington, says the lessor has taken several positive steps over the past three years, including a major upgrade to the quality of its aircraft to the lease portfolio, significant reductions in the lessor's SG&A (selling, general and administrative expenses) and debt costs, and a major share repurchase programme: the past two-and-a-half years has resulted in FLY buying back 32% of its shares at a 31% discount to its third-quarter 2017 net book value.

Barrington admits that FLY has been investing in new aircraft at a "prudent pace" because the lessor has not wanted to follow the market down to unacceptable returns.

Last year, FLY invested $456 million in 10 aircraft that would contribute $47 million in additional annual revenues. Since 2015, the lessor has sold $1.7 billion-worth of aircraft with an average age of 13 years and replaced them with $1.6 billion-worth of aircraft with an average age of 2.5 years.

"This fleet upgrade has resulted in FLY being an industry leader in terms of the quality and low age of our fleet," says Barrington.

But the Airasia transaction will accelerate the lessor's growth and improve its portfolio quality further. The Airasia portfolio acquisition comes in three parts, each involving an investment by FLY of more than $1 billion for total committed and potential investment by FLY of over $3 billion between 2018 and 2025.

The committed portfolios involve 55 aircraft and the option portfolio involves a further 20 aircraft. Of these 75 units, 41 are the latest-technology A320neo-family aircraft.

The initial committed portfolio investment involves the purchase by FLY of 34 A320 aircraft and seven CFM56 engines, leased to five Airasia Group airlines with one A320 operated by Pakistan International Airlines. The average age of these aircraft is 6.6 years and the average remaining lease term is 6.2 years.

FLY says the metrics are very similar to its existing portfolio.

Those portfolios provide the lessor with significant growth possibilities. Of the 41 new-technology aircraft involved, 21 are A320neo-family aircraft, which FLY committed to purchase and lease to Airasia Group of airlines under 12-year leases. Deliveries are scheduled between 2019 and 2021.

Barrington says the orderbook of the latest-generation aircraft has several attractive features. First, the lessor's committed deliveries are matched by committed leases and will be debt-funded by a committed facility.

Second, FLY benefits from Airasia's preferential pricing, which results from its large order position with Airbus. Third, the fact that FLY is not required to advance any predelivery payments will lead to enhanced returns.

"The transaction provides significant additional benefits to FLY's already attractive portfolio, particularly as it provides a catalyst for our transition to the latest-technology aircraft. On a pro forma basis, and assuming no aircraft sales, our committed purchases of 55 aircraft will increase our portfolio value by 66% from its current $3.1 billion to approximately $5.2 billion," says Barrington.

He adds that once the deal is completed, 33% of FLY's pro forma fleet by value will be next-generation aircraft.

"It will also reduce our average fleet age by 20% to 5.1 years and will increase our average lease term by 18% to 7.4 years," he adds.

The total price of this portfolio will be about $1.1 billion, which the lessor will settle with just over $1 billion in cash and through the issue of 3.33 million FLY shares at $15 a share.

FLY says the initial 34 aircraft will be financed with just under $700 million-worth of committed financing.

Wesley Dick, senior vice-president, FLY Leasing, said in March 2018 that most of this amount will be raised through a four-bank syndicate while FLY will also use its existing aircraft acquisition facility.

"That transaction features two tranches of debt and margins that are in the Libor plus 100-basis-point to 200-basis-point range. And that's generally in keeping with how we think about the financing cost for a tier one airline like Airasia and that would also be applicable to forward commitments," he said.

Dick adds that FLY does not have committed financing for the sale-and-leaseback portfolio that will come as the second phase. "We have a lot of bank demand," he says.

Assuming no aircraft sales, the geographical split of the leases will be heavily weighted towards Asia, which continues to be the fastest-growing aviation region.

"After the acquisition of the initial 34-aircraft portfolio, Airasia will become FLY's most significant lessee with 10% of our fleet by value. Three other Airasia Group airlines will also feature among our top 10 exposures, with Thai Airasia at 5%, Indonesia Airasia at 3% and Airasia India at 3%.

"Overall, our exposure to our top 10 lessees will reduce some from 55% to 54% with our exposure to the entire Airasia Group being at 24%. Lessors currently have a low exposure to Airasia Group airlines and so we expect that there will be a ready market to reduce our exposure to the group over time, and there are no restrictions on us doing this. We are targeting approximately $150 million of Airasia Group sales annually," says Barrington.

The second portfolio involves the purchase by FLY between 2019 and 2021 of 21 A320neo-family aircraft, powered by CFM LEAP engines. These aircraft will be purchased new from Airbus and the lessor will lease them to Airasia Group airlines on 12-year leases, on terms that have already been agreed with the group. FLY has also arranged debt financing for these purchases.

The third portfolio involves options by FLY to acquire 20 A320neo aircraft. Deliveries will commence in 2020 and stretch through 2025. BBAM, on behalf of FLY, will mark these aircraft for lease to its global airline customers.

In May 2018 FLY said the lease rates factor on the 21 A320neo family sale-and-leaseback deal was 0.77%, and it will not firm the options if they remained the same.

On its second quarter earning call in August 2018, BBAM chief executive officer Steve Zissis said: "Fly will evaluate the auction to acquire the 20 aircraft as it falls due based on the demand from airlines, for leased aircraft and the availability of attractive financing at the time. At this point in time, these options are certainly attractive and we would expect to exercise on."

Shares lock-up

An interesting feature in this transaction is Airasia buying shares in FLY Leasing. The Airasia shares will be locked up for a very long term through 2021. FLY will issue 3,333,333 new shares at $15 a share in a $50 million deal.

"We acknowledge that newly issued shares aren't being issued at a discount to book value. But even pro forma for the transaction, if we look at the amount of time it will take for the business to earn back that day one book dilution on a per-share basis, it's less than two-quarters of earnings. So, the combination of the premium and what this means for the business in terms of its earnings power is something we're excited to talk about," says Dick.

In addition to Airasia acquiring shares in the business, the management team at BBAM and Onex, one of BBAM's key shareholders, will each be acquiring an additional 667,000 newly issued FLY shares also at that same 26% premium to the current share price, adding an additional $20 million. BBAM and Onex will own more than 17% of FLY Leasing after the completion.

A cradle of Chinese civil aviation?

It all began when a trade delegation from the province of Henan visited Lithuania hoping to buy milk, but ended up buying aircraft, reports Michael Allen.

In 2015, a trade delegation from China's Henan province visited the Baltic state of Lithuania seeking shipments of milk. Instead, they ended up involved in aircraft leasing.

Having made an investment in Henan Cargo Airlines, the Chinese were looking for dairy products to import to China using Cargolux aircraft, says Tomas Sidlauskas, chief executive officer of AviaAM China, recounting the story behind his company's Chinese joint venture, AviaAM Financial Leasing China.

While the delegation was in town, a third party brokered an introduction to AviaAM, which wanted to discuss the establishment of a leasing portfolio. AviaAM Leasing and Henan Civil Aviation Development and Investment (HNCA) launched the joint venture (JV) leasing company in 2016.

"It's interesting – you come to buy milk, but you buy aircraft," says Sidlauskas. "We always had the feeling we would like to do something in China, but we really needed the partner who was capable to do that. It wasn't pure luck, but there was a luck factor as well.

"The main idea is we are bringing the deals to the table and they are bringing the financing, because they promised to give us competitive financing from the local banks," says Sidlauskas, adding that the project received political support because it is aligned with China's One Belt One Road initiative. The joint venture has already completed transactions with Russian carrier Aeroflot, with which AviaAM was already connected.

"The main thing for Aeroflot is that we had a good relationship and they had a lot of brand-new aircraft. To build a portfolio quickly, it's better to do it with well-known airlines. It's easier to get the financing and it's easier to prove to the JV partner that the airline is good," says Sidlauskas. Sidlauskas says the joint venture is now targeting deals in Commonwealth of Independent States countries, whose carriers might struggle to secure financing.

"[In those countries] it's not easy to get financing from the international society because of the credit rating of the country, but to get financing from China it's not that hard," says Sidlauskas, adding that while pricing was not that good for the joint venture, margins were higher compared with deals in the rest of Europe and in North America.

That joint venture now has 11 aircraft in its portfolio, with another two expected soon.

Lagging behind

Historians of China acknowledge Henan, the province from which the delegation came, as "the cradle of Chinese civilisation", but in recent decades Henan has fallen behind economically. Poverty remains a problem and Henan has not benefited from China's economic rise as much as richer coastal areas. A 2008 article in Hong Kong newspaper *South China Morning Post* described Henan as having a "glorious past" and "strategic geographic location", but "lagging behind in China's economic boom" after three decades of reform and opening up. Now, however, the province is developing rapidly, with aviation a pillar of that growth. Could the cradle of Chinese civilisation also become a cradle of Chinese civil aviation?

Ryan Guo, managing director of Zhongyuan Aviation Leasing, a lessor based in Henan's capital city Zhengzhou, thinks so. He says the Chinese government has identified Henan as suitable for the development of aviation and aircraft leasing. Zhongyuan Aviation Leasing is backed by five Chinese shareholders: Zhongyuan Asset Management, Henan Province Airport, Hengyu Investment (HK), Zhengzhou Airport Economy Zone Xing Gang Investment and Henan Land Assets Management.

At the end of December, Zhongyuan Aviation Leasing closed its first deal, a $98 million 12-year sale and leaseback for Lucky Air for one Airbus A330-300 with funding from China Development Bank's Henan branch. The deal was structured via a special purpose vehicle (Henan YuPeng Aviation Leasing) through the Henan Zhengzhou Airport Economic Zone, the first time this type of structure has been used. Guo says the deal received strong support from the Henan government, which gave tax refunds to Zhongyuan Aviation Leasing. He says it is the first operating lease deal in China for which the State Administration of Foreign Exchange allowed the collection of US dollar-denominated lease rentals.

The fact the government granted tax incentives via this economic zone shows that the government supports aircraft leasing development in Henan. Only a limited number of areas in China offer these kinds of benefits, the most active of which is the Tianjin Dongjiang Free Trade Port (DFTP), where more than 1,200 aircraft have been delivered, according to a DFTP source. Before joining Zhongyuan Aviation Leasing, Guo worked in the richer southern Chinese province of Guangdong, which boasts two economic powerhouses: Shenzhen and Guangzhou.

There, Guo headed the financial leasing division of the Qianhai Shenzhen-Hong Kong Modern Service Industry Cooperation Zone, researching how to attract domestic and foreign leasing companies to set up special purpose vehicles (SPVs) in the zone. In an October 2015 interview with *Airfinance Journal*, he discussed how Qianhai wanted to follow on from the success of other special zones in China such as the DFTP. He said that, because of its proximity to Hong Kong, Qianhai had been given permission from the Chinese central government to implement "special policies" and was being allowed to research how to introduce English law practices into Qianhai.

"Especially for the aircraft financing sector, the law is English law, so we want to do some research to introduce more English law into Qianhai," he said at the time.

"That would not only allow the Chinese leasing companies to get more guarantee and more protection from the lease agreement, but we hope it will also give the foreign leasing companies like GECAS, ILFC or CIT more confidence to set up SPVs in China." However, Guo now acknowledges that some provinces have prioritised the development of aircraft leasing more than others.

"Guangdong province has a lot of economic support and they also have a lot of different kinds of businesses like insurance and banking, investment banks – so much support. Maybe for the aircraft leasing industry it's not very important, not very big business in the whole economic plan," he says. Guo adds that one of the biggest challenges for Qianhai was that Guangdong, unlike Henan, was not granted permission from central government to allow lessors to collect foreign exchange rentals in US dollars.

Move to Hong Kong

An attractive leasing structure in the Henan Zhengzhou Airport Economic Zone and strong government support may still not be quite enough to keep lessors in Henan. Zhongyuan Aviation Leasing is planning to move much of its operations down to the Chinese special administrative region of Hong Kong, where lessors enjoy preferential tax rates. ICBC Financial Leasing closed the first leasing transaction to take advantage of the recently passed bill to lower the effective tax for lessors in the city.

Guo, who said in June 2017 that his company was considering a move to Hong Kong to internationalise its business and take advantage of the tax reforms. He visited Hong Kong with his shareholders in March to explore a potential listing on the city's stock exchange. Guo hopes to make the move by the end of 2018, pending approval internally and from Zhongyuan's local government shareholders. "We will keep some people in Zhengzhou, but I guess most of the team will move to Hong Kong or we will recruit new people at Hong Kong. The operation team, especially the financial team, most of them will be based in Hong Kong," says Guo.

He is also considering having a second office in neighbouring Shenzhen, because of cheaper rents there.

"It's up to how big an office we rent. Not only our company, but my shareholders have other business [besides aircraft leasing] like distressed asset management and a shares investment company. This office will include all these businesses," says Guo.

"After the shareholders become a listed company in Hong Kong, then maybe later we will become an independent department to IPO [initial public offering] independently."

Despite concerns about low lease rate factors in China and an influx of new lessors crowding the market, Guo is optimistic about the future of aircraft leasing in China.

"I think the market is becoming more and more rational," he says, explaining that the biggest leasing companies have less interest in doing sale-and-leaseback transactions these days. Guo adds that despite competition from new lessor entrants, these newbies generally cannot get their shareholders to support leasing aircraft with "very lower lease rates compared to big leasing companies".

He adds: "Maybe 100 or 200 aircraft will deliver in one year, but for so many leasing companies they compete with just this piece of the market, so it needs time. I guess one year or two years later the lease rate will go up gradually."

Guo thinks big leasing companies will have to change their business models to explore more services besides pure aircraft leasing, such as aircraft part outs.

While Zhongyuan Aviation Leasing will continue to work with local government to arrange innovative deal structures and develop Henan's aviation industry, Guo – who has experience at other Chinese lessors CCB Leasing and CDB Leasing (now CDB Aviation) – acknowledges the need to remain true to a tried-and-tested aircraft leasing business model. "I guess we will just have the same business model as other leasing companies: sale and leaseback and place orders," he says. "We have to finish one thing, step by step."

From Luxembourg to Zhengzhou

Luxembourg cargo carrier Cargolux Airlines has been flying to Zhengzhou Xinzheng airport (CGO) since 2014 and has 34 flights in and out a week.

Richard Forson, Cargolux's chief executive officer, describes Zhengzhou airport as a "powerful hub".

He says: "We've seen a significant increase in tonnage from our side and last year we transported a total of 147,000 actual tonnes out of CGO, and it seems to be attracting a lot of attention of many other carriers as well that want to operate into CGO.

"Obviously, Shanghai is congested, Beijing is congested, so we've been pretty pleased with the success we've had of CGO as a traditional point in China. It's also allowed us to expand our footprint." Henan Civil Aviation Development and Investment (HNCA), the same company that owns part of AviaAM China, owns a 35% stake in Cargolux. The two companies are setting up an airline called Henan Cargo Airlines, in which Cargolux will hold 25% (the maximum allowed under Chinese foreign investment rules) and HNCA 75%.

Forson is still considering options for Henan Cargo Airlines' fleet, which will start with three-to-five aircraft. "One option is to source from our fleet. The other is to go into the market and see what is available. We are a Boeing 747 operator, so having 747s there we are able to provide them with immediate maintenance support," he says.

"The big thing – once we really scan the market to see what's available – is to what extent we can transfer aircraft from our fleet, although, at the same time, I don't want to see any reduction in our fleet. One has to balance it out; if I had to transfer out of my fleet, I would seek alternative replacements to come back into Cargolux's fleet."

Asked whether he would utilise the same Henan Zhengzhou Airport Economic Zone structure as Lucky Air did via Zhongyuan Aviation Leasing (see main article), Forson says it is something Cargolux has examined. "Obviously, if we were to decide to lease aircraft in from a lessor we would investigate what benefits there would be in the zone surrounding the airport," he says.

"I know there are other free zones that quite a number of transactions have been done through. For Henan Cargo Airlines, it would definitely be one of the alternatives we would look at in sourcing the aircraft."

Forson says strong support for aviation in Henan comes not only from the provincial government but the Communist Party's central committee. He adds: "It forms an integral part of what they call the Air Silk Road, which is part of the One Belt One Road strategy that President Xi has mentioned on many occasions."

Narrowbody trading buoyant: Fleet Tracker

Narrowbody assets are most in demand among lessors, which traded 124 Boeing 737-family and 114 Airbus A320-family aircraft with their peers between September 2016 and September 2017.

For the first time, *Airfinance Journal* has produced data to monitor lessors' trading activity over the past year, including the largest buyers and largest sellers of aircraft. *Airfinance Journal*'s Fleet Tracker recorded 458 trades during the 12 months to September 2017 with an aggregate current market value of $11.8 billion. The data includes secondary market trades between lessors only; it does not include sale and leasebacks.

The figures are based on data submitted by lessors in September 2016 and September 2017. One caveat is that much of the data is based on lessor submissions for the 2016 and 2017 Leasing Top 50, so this will unlikely represent every lessor trade in the market. However, it provides a unique insight into secondary market activity that is not available elsewhere.

The Boeing 737 family pipped its rival the Airbus A320 family in the total number of trades, trading 124 times compared with 114. Despite this, the A320 was the most popular individual type, with 87 aircraft traded over the year, as well as one A320neo and 26 A321s. The 737-800 was traded the most out of the 737 family, with 77 aircraft transferred between lessors over the period.

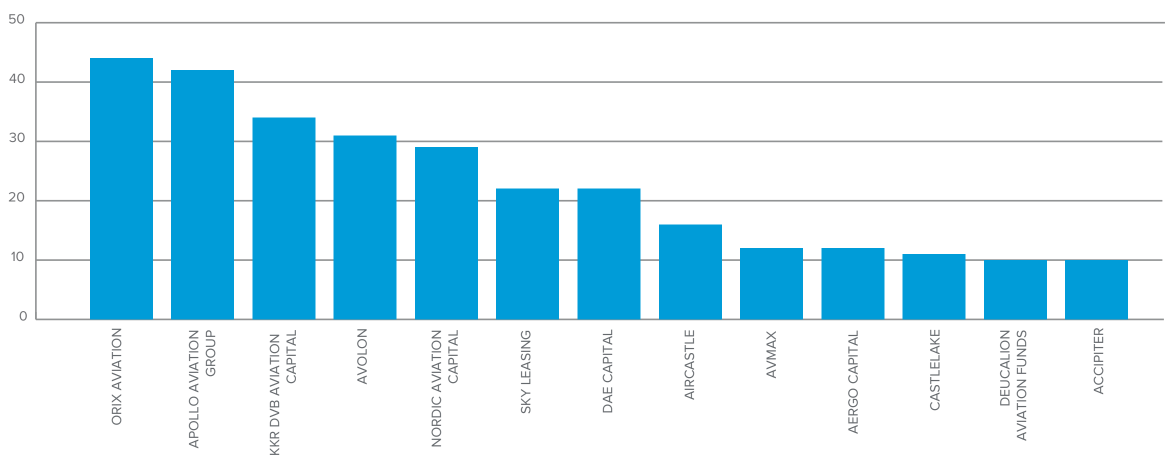
On the widebody side, the A330 proved to be a surprisingly liquid secondary market asset among lessors, with 41 aircraft traded over the 12 months' period. Boeing 747s and 787s were less dynamic, with four 747s and two 787-8s sold between lessors. The most liquid Boeing widebody was the 777 family, with four -200ERs, four -300ERs and three -200Fs sold over the course of the year. Of the 41 A330s, 27 were A330-200s and 14 were A330-300s. Aengus Whelan, the former head of trading at Kuwait-based lessor ALAFCO, and now the chief commercial officer of Stellwagen, believes that more -200s were sold because the -300 has longer-term appeal, so lessors are more likely to hold on to them. He adds that certain lessors "are de-risking a little bit" by disposing of -200s.

"Those that have A330 concentration are being pragmatic and reducing some of that exposure. Those buying are happy to take up that exposure because they would have a lower concentration of them," he says.

"Some lessors might pay for a widebody because they're getting the revenue they need and they're not as price sensitive as some of the narrowbodies, so overall they're taking a revenue aspect into account and the risk of the asset. They're making the judgment call that it's better to spend their dollars on an A330-200 than on an overpriced, overstretched A320 or 737-800."

Whelan says that some buyers take widebodies unwillingly as part of a wider portfolio. For example, six narrowbodies and one widebody might be sold as an indivisible package that is both "sweet and sour" for the buyer.

Most aircraft acquired



ORIX Aviation was the largest buyer, acquiring 44 aircraft over the course of the year. Half of ORIX's acquisitions were for a 50/50 joint venture with Merx called Kornerstone. Apollo Aviation Group was the second-largest buyer, acquiring 42 aircraft. Another joint venture, between DVB Bank and asset manager KKR, called KKR DVB Aviation Capital, purchased 34 aircraft over the period. Avolon also scored highly, purchasing 31 aircraft from other lessors.

"Joint ventures are attractive to certain lessors and investors whose strategic objectives align," Michael Weiss, head of aircraft trading at SMBC Aviation Capital, tells *Airfinance Journal*.

"Investors are interested in these vehicles as they are able to leverage the platforms of existing lessors, with minimal investment in a platform themselves. Lessors are also interested in these vehicles as they give them access to additional sources of capital to enable them to manage their portfolios, have access to larger deals, or to enable them to bid for larger numbers of aircraft in sale and leaseback transactions," he adds.

Data from Fleet Tracker indicates GECAS was the largest seller by some margin over the year, having sold nearly double the number of aircraft as AerCap in second place. The two lessors shifted a total of 96 and 50 aircraft respectively. Avolon, Deucalion Aviation Funds and BOC Aviation were also big sellers, offloading 31, 25 and 25 aircraft, respectively, over the year.

Established lessors sell aircraft for a number of reasons. These include: to keep down the average age of the portfolio; to make sure the portfolio is diversified; and to ensure the portfolio is not overly exposed to a particular lessee. Other reasons could be to generate a profit or to ensure sufficient balance sheet capacity to do new transactions with a particular lessee, where there is an existing exposure.

"I think the value of aircraft has been pretty consistent," says Whelan. "You get a lot of buyers saying it's scarce because the portfolios are coming out in packages from those few larger lessors. It's the owners or investors with high costs of capital who feel like they're outpriced or that the lessors are looking for extras. The bottom end of the market is finding it challenging staying relevant." Whelan adds that he cannot recall an instance where a portfolio that has come on the market has not been sold.

American Airlines and Aeromexico Connect were the most traded underlying aircraft lessees, with 13 aircraft from each being traded over the course of the year. Azul Linhas Aereas and Flybe aircraft were also mobile, with 12 and 10 units being traded respectively.

Irish lessors made the most aquisitions, taking 180 aircraft over the course of the year. US lessors were the second most active, acquiring 126 aircraft over the year. The data suggests that Chinese lessors were surprisingly quiet, acquiring only nine aircraft between September 2016 and September 2017. Some trades from Chinese lessors were made through their companies' Irish headquarters – for example, with Avolon, Accipiter and Goshawk. But there was little activity from other Chinese lessors such as CDB Leasing, Bocomm Leasing and ICBC Financial Leasing.

US-based lessors were the biggest sellers over the year, selling 217 units. Irish lessors sold 89 aircraft, while Dutch lessors, mainly consisting of AerCap, sold 52 aircraft.

Boeing trades

Type	Model	Number
Boeing	737-800	77
	700	17
	900/900ER	8
Boeing	737 Classic	22
Boeing	777-200/300-ER	11
Boeing	767-300-ER	7
Boeing	747-400/400F	4
Boeing	757-200	4
Boeing	787-8	2
Grand Total		**152**

Airbus trades

Type	Model	Number
Airbus	A320/neo	88
Airbus	A319	36
Airbus	A321-100	26
Airbus	A330-200/300	41
Grand Total		**191**

Chinese and Japanese lessors were not active sellers, shifting eight and two aircraft respectively. SMBC Aviation Capital's Weiss says: "The Chinese lessors have been growing their fleets and hence have not prioritised sales. I expect that will change as they seek to actively manage their portfolios in line with more established lessors. We have also seen some Chinese lessors being more active in the sale-and-leaseback market and hence they have deployed their capital in this fashion as opposed to actively buying in the secondary market.

"Chinese money is focused on long-term yields. They are looking at the encumbered value of the assets and for as long an income stream and revenue window as possible, so that's why they've got their orderbooks. They have lower expectations on returns for the new deliveries that were anticipated years back," says Whelan.

He adds: "Aside from dealing with their orderbooks in trying to place their own aircraft, they're more conservative in trying to buy secondary assets because they're focusing on longer leases. There aren't as many longer leases out there as there were before. Most don't want to do six years or eight years; they want 10 years or 12 years, so they are focusing on that. But they are buying some portfolios and they are paying the appropriate prices to win those deals."

Weiss is positive about the outlook for aircraft trading, saying the market is "still very attractive" to investors who are comfortable with the risk-adjusted return that the aviation sector offers. He adds that he is seeing appetite from most major regions, including Asia, Europe, the Middle East and the US.

"In the absence of a major external shock to the sector, I feel that the market will continue to attract investment as investors are persuaded by the sound fundamentals of the sector."

How will AFIC impact the market?

Jack Dutton explores the implications of the new insurance product and whether it is likely to have a material impact on the market.

Bob Morin, the managing director and transaction and business development leader of Aircraft Finance Insurance Consortium (AFIC), indicated at the 20th Annual Global Airfinance Conference in Dublin in January 2018 that he expected the consortium to have a significant impact on the aviation finance market in years to come.

Responding to a question from *Airfinance Journal* about how many aircraft he expects AFIC to finance this year, he said: "I'll defer to Boeing's aircraft finance outlook that was issued in December, which says that they thought the insurance industry could provide as much as 5% financing in 2018 – about the same level as the export credit industry. "If you put that in Boeing terms, they've delivered roughly 750 aircraft… do the math… and that's roughly 35 to 40 aircraft," he adds.

The project has been an ambitious one, and Morin expects its momentum significantly to gather pace. AFIC has financed 16 aircraft since its launch in June 2017, amounting to more than $1.5 billion in assets. Nine of the aircraft were funded by commercial banks and the other seven – which include six Boeing 737 Max aircraft and a 747-8 Freighter – were financed through private placements arranged by Greensill Capital.

In a similar way to Morin's former employer, the now dormant Ex-Im Bank, AFIC looks to bring new avenues of capital into aircraft finance and attract investors that have not typically invested in aircraft before.

"When I'm talking about incremental funding for the industry, those investors probably would have never been involved in aircraft financing yet they funded six 737 Max plus one 747-8F aircraft and that really was incremental funding for the industry," he adds.

One of the biggest investors in Ex-Im-guaranteed bonds was Federal Home Loan Bank of Omaha, which before the arrival of the product, had never invested in aircraft. Morin sees new investors such as Federal Home Loan Bank of Omaha investing into aircraft through AFIC.

"These aren't the John Hancocks or the Met Lifes who have been buying EETCs [enhanced equipment trust certificates] for the last 30 years; these are other buckets of funds within these very large institutions who will now look at an aircraft deal because of the highly rated panel of insurers," he says. However, some market observers are less convinced by the potential of the new structure.

"I don't really see AFIC taking off so much," Ron Scheinberg, senior transport attorney and shareholder at Vedder Price, tells *Airfinance Journal*. "In an Ex-Im deal, where you have one credit from the US government, with AFIC you have several liability body insurers. You have to do separate credit analysis on each, so it's not anywhere near as clean a structure from an analytical perspective."

Although he believes there will be a limited role for AFIC, saying that it will continue to close "a handful of deals every year", Scheinberg does not see it having a significant impact in the market.

> *"Going forward, even if the export credit agencies [ECAs] were full and open for business, their utilisation would be way down as well."*
>
> **Ron Scheinberg**, senior transport attorney and shareholder, Vedder Price

"I see it more as some slight option in financing. Because of the robustness of the bank market and hunger for yield, I don't see a huge need for this product to begin with," he says.

"Going forward, even if the export credit agencies [ECAs] were full and open for business, their utilisation would be way down as well – if you put them in the same bucket I just don't see it being hugely active. It will be active, but I don't see it as a game changer or a big piece of the market." He expects Airbus to produce a competing insurance product for Boeing.

Duncan Batchelor, Norton Rose Fulbright's global head of aviation, believes AFIC will be in the market long term, deeming it "a positive development" for aviation finance that widens the availability of credit support for aircraft deliveries.

He believes that the arrival of AFIC shows that the market has become more sophisticated and innovative when financing aircraft.

"The AFIC insurers have stated their intention to continue to grow their portfolio of aircraft and airline customers, and this is occurring against a backdrop of increased interest from the insurance market in aircraft finance more generally. Even if (or when) ECA finance increases, the insurers have stated that they intend to continue with AFIC. This makes sense when viewed from a risk diversification perspective, as insurers will want to build up a diverse portfolio of airlines and credits."

Despite this, Batchelor says that much of AFIC's activity will depend on the availability of commercial debt and ECA financing, as well as insurers' views of different airline credits, which may not align with banks' views.

"These factors will affect pricing in the market which will, in turn, determine whether the pricing of the AFIC insurance product (a combination of the debt margin plus the insurance premium) is seen as competitive by airline or lessor borrowers."

The status of the US and European ECAs may be the determining factor of AFIC's long-term success. Although it is generally not seen as a direct replacement for ECA funding, some market sources believe if the ECAs do re-open, it may be harder to market the product.

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Airbus to hit market with Balthazar

The European original equipment manufacturer is looking to match its US rival's AFIC offering.

Airbus is in the market with an insurance-guaranteed structure, dubbed project Balthazar, for financing Airbus aircraft.

The European manufacturer and aircraft broker Marsh is expected, this year, to co-launch Balthazar, an insurance-guaranteed product designed for bank and investors that fund new aircraft purchases from Airbus.

Airfinance Journal understands that an insurance policy is almost in place and that a transaction could materialise in the second half of 2018.

Clifford Chance will be the law firm overseeing the Balthazar transactions, say sources. Under the insurance policy drafted, insurance companies will have a minimum A- rating.

Insurance companies will be agreed by the banks, and Airbus is expected to participate in the risk cover of each transaction. It is not clear if the Airbus coverage, believed to be minimal, will be on the junior tranche or on a pari-passu basis.

Airfinance Journal understands that Balthazar pricing will be on the export credit agencies benchmark with 100% cover. The loan to values is expected to be below 85%. The insurance-guaranteed structure will also not be exclusively US dollar denominated but would accept the Euros currency for some transactions.

Five insurance companies

Balthazar provides an alternative aircraft finance insurance product for new aircraft deliveries and it is believed that five insurance companies have been selected to underwrite deals. Coface for Trade, Liberty Specialty Markets, The Channel Syndicate, SCOR and XL Catrin will form a consortium of insurance companies as the initial underwriting panel to provide capacity for funding new purchases from Airbus.

Balthazar will be a new way for insurers to support aircraft financing and its insurers rely on commercial banks to structure and negotiate a transaction.

The standard structure will be similar to Boeing's insurance-guaranteed structure, but acceptable structures include finance leases, Japanese operating lease with call options and French tax leases.

Pre-agreements will be in place prior to banks approaching customers with the product, say sources. Those pre-agreements include insurance premiums, policy wording and insurance term before the bank issues a bid. But insurers' agreements can be adaptable to each financial institution and underlying transaction, add sources.

Airbus is said to have launched a request for proposals for a servicer that will manage the day-to-day management of transactions as well as default scenarios from clients. The servicer, which will act on behalf of the insurers, will also play a key role in facilitating communication with banks.

Airlines have increasingly turned to less conventional ways to finance aircraft, given the abundance of liquidity in the market and that Boeing's and Airbus's export credit agencies are unable to guarantee financing for commercial deliveries.

Marsh launched insurance-guaranteed product Aircraft Finance Insurance Consortium (AFIC) to fund new aircraft purchases from Boeing in the second quarter of last year. AFIC is underwritten by four insurance companies: Allianz, AXIS Capital, Fidelis and Sompo International (formerly Endurance).

Airbus hopes to complete at least one transaction this year under its insurance-backed financing product.

At *Airfinance Journal*'s 18th Asia Pacific Airfinance conference in Hong Kong in November 2017, Airbus's vice-president of customer finance, Christin Lodberg, said the European manufacturer was working on a similar product as AFIC for Boeing deliveries. "It is early days still, but we hope to have it ready by early 2018."

Lodberg added that the new Airbus product will be "an addition" to export credit agency financing and will have "attractive terms".

Ex-Im reinsurance programme

In late March, the US Export-Import Bank (Ex-Im Bank) launched a risk-sharing programme with private sector reinsurers for its aircraft loan portfolio. The initiative provides up to $1 billion in cumulative loss coverage for each borrower in the lender's commercial aircraft portfolio, says Ex-Im.

Ex-Im Bank worked with Aon Benfield, the global reinsurance intermediary of Aon, to complete this $1 billion reinsurance programme. Coverage is shared between the bank and a group of 10 insurance companies led by XL Catlin, Liberty Specialty Markets and Everest.

Ex-Im Bank says the programme is the largest public-private risk-sharing arrangement for a US government credit agency. The transaction represents the maximum allowable coverage permitted under Ex-Im Bank's charter and fulfils its 2015 congressional reauthorisation mandate to engage in risk sharing with the private sector to minimise the bank's and US taxpayers' liability for potential future losses.

"We are excited to announce this historic arrangement with the private sector that protects Ex-Im Bank and safeguards US taxpayers' interests without requiring additional funding," said executive vice-president and chief operating officer Jeffrey Goettman, who is serving as Ex-Im Bank's acting head of agency.

"Ex-Im is committed to a path of financial innovation and risk sharing with the private sector," he adds.

Airbus backing will boost CSeries

Olivier Bonnassies speaks to seven appraisal firms about their outlook for aviation finance this year.

AFJ: Which aircraft type saw the greatest recovery in 2017?

Rob Morris, global head of consultancy, Ascend: Freighters, especially the 757, 767 and even the 747-400F/SF! But passenger 757s, 767s and 737 classics also saw upward movement due to demand for feedstock. Some vintages saw improvements close to 20%.

Douglas Kelly, senior vice-president, asset valuations, Avitas: The 767-300ER did very well due to a rebound in the cargo market. Amazon Air [formerly Amazon Prime Air] contracted to convert 40 767 passenger aircraft to freighters through ATSG and Atlas Air for delivery in 2017 through 2018. This demand has kept passenger and freighter values firm. Now, Boeing is being pressured to restart production of the passenger 767 300ER and increase production of the freighter.

Gueric Dechavanne, vice-president, Collateral Verifications: Used A320s saw a great deal of value recovery in 2017.

Mike Yeomans, head analyst, commercial aircraft and leasing, IBA: The current-generation narrowbodies have been performing strongly but I wouldn't call that a recovery. In the widebody market, I think the 787-9 is performing well in terms of values at the moment and we have seen some strong sale–and-leaseback pricing, probably better than our earlier expectations of this aircraft. Older 767-300ERs are sought after for passenger-to-freighter [P2F] applications if they are suitable.

Olga Razzhivina, senior Istat appraiser, Oriel: There were no huge upward value movements in 2017. There is an increased demand for converted freighters with 767-300ERs benefiting the most.

Which aircraft type was the most impacted in 2017?

Morris: 777-200ER (Rolls-Royce-powered), A340-500/-600 (yet again) and the Embraer ERJ family. All declined in the 30% to 40% region.

Kelly: The small regional jets such as the Bombardier CRJ100/200s and ERJ135/ERJ145s. Values of the small regional jets continued their downward slide as the growing lease expirations contributed to the oversupply of these aircraft. While there used to be a significant premium for the ERJ145LR over the -ER model, now values have converged so that there is little difference between the models. Values for the A380s are beginning to slide as owners struggle to find homes for the 10-year-old A380s coming off lease from Singapore Airlines. The secondary market potential for this large aircraft is looking bleak.

Dechavanne: 777-200s and older A330s continued to be negatively impacted by the market environment.

Yeomans: Mid-life A330-200s – lease rates are poor, storage and availability are high. Air Berlin and [Russian carrier] Vim Airlines failures have not helped matters. Some aircraft have been overhanging the market for a while. There is compression in the values and lease rates across vintages. Late noughties aircraft, such as those between 2008/2009, are not much better than a 2000-built aircraft. As for the Boeing 777-200ER – again, the Vim failure has not helped. Storage levels are increasing; values are declining.

Stuart Rubin, principal, ICF: Perhaps a notable point has been the performance of the 777-300ER, which now appears to have raised market concerns, amplified by recently announced production cuts, along with continuing and growing concern over the A330-200 and 777-200ER types. Of greater concern, however, is the performance of the youthful Airbus A380 as early lease returns ensue, and the very large aircraft sector in general.

Razzhivina: The 777-300ER was the biggest disappointment to its investors. The issue is, the few returns we have seen are only the beginning: the production ramp-up of the type suggests there is a far bigger wave of returns on its way. The A380 is also under strong pressure.

Which aircraft types are in oversupply and harder to place?

Morris: Larger widebodies, especially out of production or soon-to-be out of production. From the popular types, the 777-200ER sticks out the most. Narrowbodies are generally better placed, with strength of overall demand supporting placements of aircraft including those which exited Monarch Airlines and Air Berlin late last year.

Kelly: Small regional jets [see above]. Most of the older out-of-production widebody types.

Rubin: A common concern for investors is that of aircraft oversupply. In general terms, however, global load factors are at near historic highs, orderbooks are strong, and aircraft storage and retirement rates at a relatively low level. Largely, OEM [original equipment manufacturer] production is aligned to demand growth, which remains strong, particularly in emerging markets. That said, as noted by ICF for the widebody sector, large and very large aircraft types in particular are proving difficult to place, while older current-generation narrowbodies are proving more problematic to remarket at acceptable lease rates.

Dechavanne: ERJ145s and CRJ200s, A319s, A330-200s, A340s, 747s and 777-200ERs.

Yeomans: There is still some oversupply in the ATR72-500 market; however, IBA predicts this market will strengthen through 2018. A330-200 and 777-200/-200ER markets are oversupplied. All 737-300, MD82, 747-400, ERJ145, CRJ200 aircraft.

Oliver Stuart-Menteh, managing director, Fintech Aviation Services: The A319 and 737-700 market is currently oversupplied, though with the release of the -700 freighter programme, there will be renewed demand for a select number of aircraft. Aircraft can be purchased or leased at a price but often the rates on offer will not satisfy the financial requirements of the owner and transactions become stalled. Widebody aircraft such as the A380, 777-200 and the 50-seat regional jets such as the ERJ145 are also extremely difficult to place.

Razzhivina: Practically anything with two aisles in it. Even sales of new orders have slowed down significantly.

Is the outlook for the CSeries more bullish now the Airbus agreement is in place?

Morris: In a word yes. Marketing and in-service support from Airbus makes the aircraft a more attractive proposition than previously, and witness recent commitment conversion to firm orders which supports this.

Rubin: If it passes regulatory muster, ICF believes the fortunes of the CSeries programme have received a real boost with Airbus's announcement that it will take a majority stake in the programme. Operators, financiers and other investors will have gained confidence in the financial underpinnings of the programme, and Bombardier will now have access to Airbus's customer base and global supplier support network, while gaining production economies of scale. While events have yet to play out fully, it appears that Bombardier will now be able to avoid punitive tariffs applied by the US Department of Commerce by manufacturing the CSeries at Airbus's facility in Mobile, Alabama.

Yeomans: The CSeries programme should benefit from Airbus's backing. The technical ability of the aircraft is not in question. The longevity of the programme, the US trade dispute and whether it is competing in the right capacity segment are the key questions. In IBA's view, the CSeries can deliver the right operating costs and there is sufficient market demand for this aircraft. It needs a broader operator base to give some confidence to investors and Airbus could really help in this regard. The next few weeks/months will be key as we see how the dispute with the US plays out.

Stuart-Menteh: The support of Airbus will provide renewed confidence to the marketplace; however, it should be remembered that the targeted market is relatively small compared with the 160- to 240-seat market. Demand for large-scale orders will arise primarily as a result of the phase out of older equipment rather than a dramatic expansion of the market. With a significant amount of potential demand located within the USA, minimising any trade tariffs will be a key driver to ensuring that the programme remains active.

Razzhivina: The Airbus involvement with the CSeries lends more financial credibility to the programme; however, it does not make sales that much easier. It is a standalone product and does not benefit from commonality with the A320 family, at least for now. The programme still needs another big order and a number of medium-size commitments (10 to 20 aircraft) to gain momentum.

Are we likely to see more order deferrals? If so, what type of airline is likely to defer?

Morris: If demand remains strong, there is no reason to expect an increased level of deferrals or cancellations. But if demand reduces significantly (albeit there are no indicators that this will happen), then of course deferrals will also likely increase. The airlines with the fastest-paced growth and taking the most deliveries on a monthly basis are the ones most likely to reshuffle their delivery schedule in the event of growth slowing down.

Kelly: Yes, expect to see more widebody deferrals since there seems to be too much supply in this market. We may also see some narrowbody deferrals if any airlines get into financial difficulty or there is a downturn in traffic. However, we are expecting 2018 to be a strong year for traffic growth as the world economy continues to climb higher.

Rubin: Operators of large widebody aircraft, such as Emirates Airline and Etihad Airways, may be expected to defer aircraft orders in a period of oversupply relative to demand. Prudent airlines such as Jetblue Airways seeking to reduce capital expenditure and improve return on investment following over-ambitious growth plans have, and are likely to continue to defer narrowbody orders in the near term. Softening yields and increasing costs may cause ambitious low-cost carrier [LCC] operators such as Norwegian Air Shuttle to defer both narrowbody and widebody aircraft to reduce operating costs and maintain liquidity. Given the overall orderbook trend towards the LCC sector, most deferrals are expected to emanate from this sector.

Dechavanne: Yes, I believe airlines with larger orderbooks will continue to take advantage of cheap lift from aircraft on existing leases by extending them and thereby deferring orders further out.

Yeomans: We are likely to see more widebody order deferrals from the Middle East carriers. Traffic growth has slowed and while capacity growth is being curbed to some extent, we have seen falling load factors for the Middle East carriers at the tail end of 2017. This points to carriers pushing back more deliveries.

Stuart-Menteh: The economic picture across the globe is imbalanced with revenue passenger kilometre growth rates varying considerably across the regions, and airlines are still adjusting forecasted capacity. The Middle East carriers have witnessed a significant slowdown. Availability of older aircraft being phased out of China, coupled with attractive lease rates, are proving attractive to US flag carriers who may have previously ordered from new.

Razzhivina: It appears that all kinds of airlines are deferring their orders. Sometimes it is to do with the mix of sizes and also with availability of cheap older aircraft which do not lack in reliability. As long as oil prices remain low, we are likely to see major airlines capitalising on the used aircraft availability.

Chinese lessors opt for Jolcos

Chinese lessors are warming to the Jolco because they can obtain a high percentage of financing and banks are often willing to lend higher LTVs on these transactions, write Michael Allen and Mike Duff.

The Japanese operating lease (Jol) and Japanese operating lease with call option (Jolco) markets remained robust in 2017.

Airfinance Journal has compiled a survey of Jol and Jolco transactions completed between 1 January and 31 December 2017 to give a snapshot of the most active players in those markets. The survey is based on submissions from companies active in the Jol and Jolco markets, as well as data already held by our powerful Deal Tracker product.

Deal Tracker recorded a total of 66 Jol transactions and 51 Jolcos in 2017, covering a total of 94 and 65 aircraft, respectively. More than 70% of the Jols were for Airbus A320- and Boeing 737NG-family aircraft, though the market also absorbed 24 widebodies. Narrowbodies were also popular for Jolcos, but notably the 787-9 came second in the ranking.

A number of A320neos, ATRs and Embraers were also successfully financed. The credit quality generally of lessees reflected Japanese investors' traditionally low threshold for lessee credit risk. Three Chinese leasing companies – CCB Financial Leasing, CMB Financial Leasing and China Aircraft Leasing (CALC) – also used Jolcos to fund operating leases to their airline clients.

"The main Chinese lessors are also using such products as a key funding source for their new acquisitions," says Thierry Pierson, managing director at Asset Brok'Air, adding that this gives them additional flexibility in their portfolio management.

Pierson's company, which established a permanent base in Japan last year, completed a Jolco transaction in 2017 for China Aircraft Leasing (CALC), a Hong Kong-based lessor with partial mainland Chinese ownership.

At *Airfinance Journal*'s 6th Annual Japan Airfinance Conference in April 2017, CALC's managing director, finance, Christian McCormick said the Jolco product has aided the growth of CALC's international fleet.

For its aircraft leased into China, CALC can obtain virtually 100% financing because the Chinese banks "look at CALC and the airlines as very high-quality corporate risk" and are willing to lend "very high" loan-to-values (LTVs) to CALC, to achieve 100% financing for the internationally leased aircraft CALC needs to find equity, he said.

"One great source of equity is Jolco equity," said McCormick, adding: "For us, it tops up whatever the banks would not be prepared to do, so we do achieve nearly 100% financing – sometimes 100% financing."

Robert Melson, a partner at K&L Gates, which came first among law firms in the survey, says: "In 2017, we continued to see new lessee credits enter the Jolco market to satisfy

2017 Jol/Jolco league tables

Top type-model

Jol transactions		
Rank	**Type-model**	**No. of a/c**
1	Boeing 737-800	22
2	Airbus A320	19
3	Airbus A321	17
4	Airbus A330-300	8
5	Boeing 737-900ER	5
5=	Boeing 787-9	5
7	Boeing 777-300ER	4
7=	Airbus A330-200	4
9	Boeing 737-900	3
9=	Airbus A350-900	3
11	Boeing 787-8	2
12	Embraer E190-100STD	1
12=	Airbus A319	1
	Total	**94**

Source: *Airfinance Journal's Deal Tracker, deals closed 1 January – 31 December 2017*

Jolco transactions		
Rank	**Type-model**	**No. of a/c**
1	Boeing 737-800	18
2	Boeing 787-9	9
3	Airbus A320neo	8
4	Embraer E175-200LR	5
4=	Airbus A320-200	5
6	Airbus A350-900	4
6=	Airbus A321-200	4
6=	Boeing 777-300ER	4
6=	Boeing 737-700	4
10	Embraer E175-200STD	3
10=	ATR72-600	3
12	Embraer E190-100STD	2
12=	Airbus A330-300	2
12=	Boeing 737Max 8	2
15	Boeing 777-200LRF	1
15=	Boeing 787-8	1
15=	Airbus A330-200F	1
15=	Embraer E190-100LR	1
	Total	**77**

Source: *Airfinance Journal's Deal Tracker, deals closed 1 January – 31 December 2017*

Top overall arrangers

Jol transactions		
Rank	**Overall arranger**	**No. of deals**
1	SMBC	6
2	MUFG	4
2=	DVB Bank	4
4	Sumitomo Mitsui Trust Bank	2
4=	Credit Industriel et Commercial	2
4=	Commonwealth Bank of Australia	2
4=	PK Airfinance	2
4=	NTT Finance	2
8	Others	8

Jolco transactions		
Rank	**Overall arranger**	**No. of deals**
1	CA-CIB	14
2	SMBC	9
3	MUFG	8
4	Asset Brok'Air	3
4=	Veling	3
5	Credit Industriel et Commercial	2
5=	DVB Bank	2
5=	Sumitomo Mitsui Trust Bank	2
5=	Natixis	2
5=	BNP Paribas	2
11	Others	11

Top debt arrangers

Jol transactions		
Rank	**Debt arranger**	**No. of deals**
1	SMBC	6
1=	MUFG	6
3	Sumitomo Mitsui Trust Bank	5
3=	DVB Bank	5
5	National Australia Bank	4
6	Commonwealth Bank of Australia	2
6=	Australia and New Zealand Banking Group	2
6=	Credit Industriel et Commercial	2
6=	BNP Paribas	2
6=	PK Airfinance	2
11	Others	9

Jolco transactions		
Rank	**Debt arranger**	**No. of deals**
1	CA-CIB	14
2	SMBC	10
3	MUFG	9
4	BNP Paribas	4
4=	Credit Industriel et Commercial	4
6	Natixis	3
6=	Development Bank of Japan	3
6=	Korea Development Bank	3
6=	Veling	3
9	Sumitomo Mitsui Trust Bank	2
9=	National Australia Bank	2
11	Others	15

Top equity arrangers

Jol transactions		
Rank	**Equity arranger**	**No. of deals**
1	NBB	16
2	JP Lease	10
3	SMFL	8
4	ORIX Bank	5
5	FPG AIM	4
6	Others	2

Jolco transactions		
Rank	**Equity arranger**	**No. of deals**
1	NBB	10
2	SMFL	8
3	Veling	3
4	Yamasa	2
4=	CA-CIB	2
4=	Fuyo General Lease	2
4=	Mitsubishi UFJ Lease & Finance	2
8	Others	7

Source: *Airfinance Journal's Deal Tracker, deals closed 1 January – 31 December 2017*

the increasing demand from Japanese equity investors for Jolco transactions.

"We also saw the use of more mezzanine/junior debt in Jolco transactions in 2017. We expect both trends to continue for 2018 based on the transactions for which we have received instructions from our clients."

Some new airline names include Jet2.com, a UK-based low-cost carrier that serves primarily European holiday destinations. The carrier is unlikely to be a household name for the Japanese travelling public or the small- and medium-sized enterprise investors in Jolcos, but our survey sees this 737 and 757 operator surpass established Jolco users KLM, SAS, Lufthansa and Emirates to take the position of top lessee by number of aircraft.

Pierson says the Jolco market is "still very competitive for traditional players, but the market trend is also to open more – largely Jolco – solutions to new names [airlines and lessors], and/or new asset classes".

Simon Collins, a partner at White & Case, which came fifth among law firms in the survey, says that equity demand is "probably stronger than I've ever seen it on the Jolco side".

He adds: "My impression as a whole is a lot of deals are getting done. There's a lot of new names. I think, traditionally, people only thought of the Jolco as something for tier-1 airlines with routes to Japan."

He says White & Case completed Jolcos for Avianca and Copa Airlines, despite neither airline having routes to Tokyo.

"The Avianca deal was extremely interesting because Avianca required the aircraft to be FAA registered and we were able to do that using a head-lease/sub-lease structure, which may have some impact in terms of being able to structure more deals into the US," says Collins.

That deal, according to White & Case's survey submission form, was for a 787-8 aircraft that delivered to Avianca on 31 October 2017. Development Bank of Japan, NordLB and SMBC provided debt, while FPG provided the Japanese equity. Collins adds that banks will say that pricing is sharpening, but that is "true across the board – that's not just Jolco". The leading overall arranger for Jolcos was CA-CIB followed by SMBC and MUFG while in the Jol market SMBC, DVB and MUFG led the way. Three of the four Australian trading banks were active in debt arranging for both Jols and Jolcos.

The identity of equity arrangers is more difficult to determine as the Japanese leasing companies generally prefer as little disclosure about their deals as possible.

Nevertheless we identified almost all of the Jol equity arrangers which showed NBB, JP Lease, SMFL, ORIX and FPG AIM leading the way. For Jolcos we have identified almost half of the equity arrangers. NBB also comes on top of that league table, followed by SMFL.

Top law firms

Jol/Jolco transactions		
Rank	**Law firm**	**No. of deals**
1	K&L Gates	54
2	Clifford Chance	32
3	Norton Rose Fulbright	12
4	Nishimura & Asahi	8
5	White & Case	7
6	Dentons	6
7	Vedder Price	4
7=	Watson Farley & Williams	4
9	Allen & Overy	3
10	Pillsbury	2
10=	Debevoise & Plimpton	2
10=	DLA Piper	2
10=	Berwin Leighton Paisner	2
10=	Matheson	2
18	Others	3

Source: *Airfinance Journal's Deal Tracker, deals closed 1 January – 31 December 2017*

Top lessees by number of aircraft

Jol transactions		
Rank	**Lessee**	**No. of a/c**
1	Norwegian	13
2	Cathay Pacific	7
3	Wizz Air	6
4	KLM	4
4=	Cebu Pacific	4
6	Emirates	3
6=	Easyjet	3
6=	Air France	3
9	Brussels Airlines	2
9=	Vueling	2
9=	Hawaiian Airlines	2
9=	THY Turkish	2
9=	Garuda	2
14	Others	41
	Total	94

Source: *Airfinance Journal's Deal Tracker, deals closed 1 January – 31 December 2017*
Others includes the confidential parties and lessees with a single aircraft

Jolco transactions		
Rank	**Lessee**	**No. of a/c**
1	Jet2	9
2	KLM	7
2=	SAS	7
4	Lufthansa	6
5	Air Canada	4
5=	Copa Airlines	4
5=	Emirates	4
8	CCB Financial Leasing	3
8=	Air France	3
8=	Garuda	3
11	China Aircraft Leasing	2
11=	American Airlines	2
11=	Hong Kong Express Airways	2
11=	BoCom Leasing	2
11=	flydubai	2
11=	Transavia	2
11=	Aer Lingus	2
18	Others	13
	Total	**77**

Returns forge ahead

Airfinance Journal's research shows that the leasing industry made a net income of $5 billion in 2017, even excluding Avolon and the $1.3 billion of one-off tax benefits reported by ALC and ACG.

Figure 1 - Financial years ending in

$bn/FYE	2012	2013	2014	2015	2016	2017[1]
Revenue in survey	10.8	13.5	12.7	17.0	16.6	16.1
GECAS	5.3	5.3	5.2	5.3	5.3	5.1
Total revenue	**16.1**	**18.8**	**17.9**	**22.3**	**22.0**	**21.2**
PP&E in survey	92.0	108.5	107.3	114.7	120.2	121.0
GECAS	36.2	34.9	30.6	34.3	31.8	30.1
Total assets	**128.2**	**143.4**	**137.9**	**149.0**	**152.0**	**151.0**
Net income in survey	1.6	1.0	2.7	3.2	3.2	3.6
GECAS	1.2	0.9	1.0	1.3	1.4	1.3
Total net income	**2.8**	**1.9**	**3.7**	**4.6**	**4.6**	**4.8**

[1] *Excludes one-off tax benefits for ALC and ACG*

Airfinance Journal has collated and analysed the financial statements for every lessor that has so far published its results for financial years ending in 2017. This is a total of 16, including eight of the 10 largest lessors. The aggregate results are shown in Figure 1.

We have included the few key figures for GECAS which are available in the GE Annual Report. While there are some discontinuities resulting from unavailability of financial data for certain periods (e.g. we do not have access to the Avolon financial statements for 2017) certain ratios and indicators provide a good insight into the rude health of the industry. All members of the sample are "pure" aircraft operating lessors with the exception of CDB Financial Leasing which has a substantial portfolio of non-aircraft financial leases. However, close to 100% of its operating lease assets are aircraft.

These aggregate figures show that the industry generated net income of $4.8 billion in 2017, even without counting Avolon and excluding $1.3 billion of one-off tax benefits reported by ALC and ACG. As a reference, Avolon and CIT Aerospace reported aggregate net income for 2016 of $738 million so their inclusion would definitely have made 2017 a record year for the industry. The sample's Property, Plant and Equipment was $151 billion for 2017.

Much has been discussed about the wave of new

Figure 2 - Lease yield
(Lease revenue/Average PP&E)

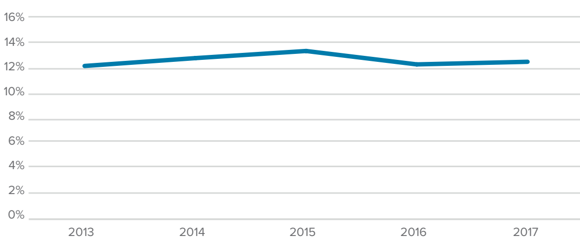


Figure 3 - Return on average equity

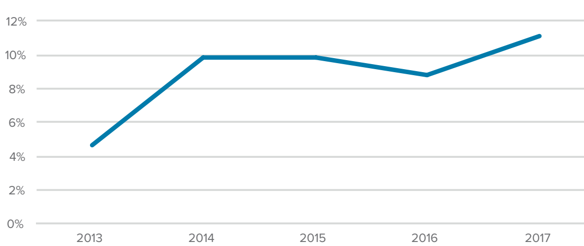


Figure 4 - Debt/equity

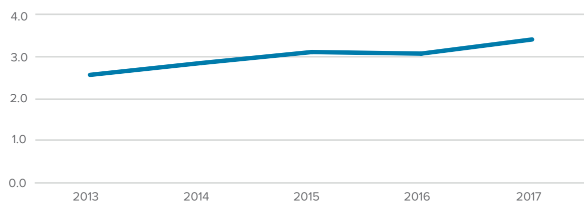


Figure 5 - Finance cost/average debt

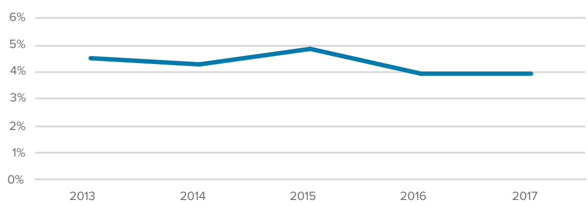
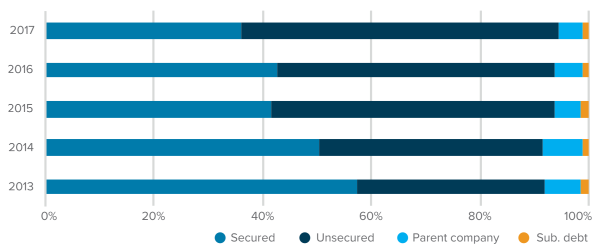


Figure 6 - Debt structure



money being invested in aircraft operating leases, bringing pressure on lease rates. This may have occurred at the margin and in emerging lessors who are not included in the study: the aggregate values show that lease yield for our sample of lessors as shown in Figure 2 held up in 2017 at 12.4% and, more interestingly, return on equity increased from 9.4% to 11 % (displayed in Figure 3).

One of the explanations for the higher ROE in our sample is an increase in leverage from 2.7x to 3.4x as shown in Figure 4 resulting from the exclusion of Avolon and CIT (which had leverage of only 0.5x in 2015). Another is a further slight decline in average interest cost at 4.1%. A further efficiency was the enhanced scale arising from consolidation: aggregate selling, general and administration expenses declined from 7.4% of revenues in 2016 to 6.7% in 2017 (and down from 9.1% as recently as 2014).

Debt structure showed a continuing trend towards unsecured debt as shown in Figure 6. Unsecured debt as a percentage of total debt has grown from 35% in 2013 to 60% in 2017.

The sample of lessors whose 2017 financials are included in the study are:

AerCap, Air Lease Corporation, Aircastle, ALAFCO, Amedeo, Air4 Plus, Avation, AviaAM, Aviation Capital, BOC Aviation, CALC, CDB Leasing, DAE Aerospace, FLY Leasing, GECAS (headline numbers only), MCAP Europe, Nordic Aviation Capital, SMBC Aviation Capital.

Overhead costs

Airfinance Journal has also taken a closer look at overhead costs (selling, general and administration expense) in the most recently published 2017 financial statements. The ranking is shown below. The biggest surprise is the wide range from a major lessor such as BOC Aviation at an impressive low of 5.8% of revenues to DAE Aerospace at 9.6%, where the recently combined DAE/AWAS platform appears on the expensive side. It is, however, only slightly worse than Aircastle, FLY Leasing and SMBC Aviation Capital, all of which incur most of their head office expenses in Ireland.

Nordic Aviation Capital also comes in high at 10.2%, presumably reflecting the costs of managing a huge fleet of aircraft with relatively low average value. Among the US lessors, ACG appears to have the most efficient platform, closely followed by Air Lease Corp. AerCap enjoys the benefit of scale.

CALC brings up the rear with a combination of employee costs, business tax and surcharges, travel and overhead contributing to its figure of 17.8%.

Lessor	SG&A expenses as % of revenue
AviaAM	1.6%
CDB Leasing	3.4%
Amedeo Air Four Plus Limited	3.5%
ALAFCO	5.6%
BOC Aviation	5.8%
Aviation Capital Group	6.7%
AerCap	6.9%
Air Lease Corp	7.3%
Avation PLC	7.9%
Aircastle	8.6%
FLY Leasing	8.7%
SMBC Aviation Capital	9.2%
DAE Aerospace	9.6%
Nordic Aviation Capital	10.2%
MCAP Europe Limited	14.9%
CALC	17.8%

High-tech takes over

Geoff Hearn looks at the market for maintenance, repair and overhaul and finds that new technology is driving demand.

The increasing role of engine, airframe and systems providers, or original equipment manufacturers (OEMs) as they are known, is seen by many industry observers as the key trend in the commercial aircraft maintenance, repair and overhaul (MRO) market. Whether this trend is a good one for aircraft operators and owners is a matter of some debate.

MRO spending increasing

The reason for the OEMs' interest is not hard to see. The MRO market, driven by an airline industry that is registering record profits, is worth more than $75 billion a year, according to international consultancy ICF in its recently released analysis of the industry.

Engine overhaul accounts for about 40% of the spend and component maintenance a further 21%, with the majority of the remainder accounted for by airframe maintenance and modifications. ICF predicts the total annual MRO figure will increase to about $118 billion by the end of 2027 and to around $140 billion by 2037.

Airframes getting cheaper to maintain

There is good news for operators and owners when it comes to airframe maintenance, because unit costs are decreasing as manufacturers seek to reduce scheduled tasks. Heavy maintenance, in particular, is benefiting from increased intervals between major checks.

Another factor shaping the future of the MRO market is the increasing importance of new-technology aircraft, which are e-enabled (enabled to use the internet) to provide enhanced capabilities for aircraft health monitoring and management. ICF estimates the current fleet of e-enabled aircraft to be around 30% of the total fleet, but the consultancy expects this to rise to about 60% by the end of 2037. Another significant trend is the increasing importance of the narrowbody market. Figures published recently by the Oliver Wyman consultancy estimate that single-aisle aircraft make up 57% of the commercial aircraft fleet and account for 45% of MRO spend. Widebody aircraft, although only making up 20% of the current fleet, account for 44% of MRO expenditure because they are more maintenance-intensive and more complex. However, this looks set to change as the narrowbody fleet grows and accounts for a greater share of the total commercial aircraft fleet. Oliver Wyman forecasts that narrowbody MRO spend will increase by about $28 billion over the next 10 years, taking its share of the total annual spend to around 55%.

According to ICF's analysis, the next decade will see airframe MRO demand migrate from older aircraft to composite and more-electrical aircraft. Similarly, Oliver Wyman forecasts that, by 2028, close to 30% of annual MRO spend will be associated with aircraft built in the 2010s.

Newer aircraft have extended check intervals and reduced labour-hour requirements, so this trend has implications for MRO providers. A symbol of the trend to new-technology aircraft is the A320neo C-check carried out in April by Romanian MRO Aerostar. This was one of the earliest Neo C-checks to be carried out worldwide and the first to be done in Europe.

Early retirement less frequent

According to analysis by ICF, a reduction in the price of aviation fuel from its peak level has led to a downturn in the number of retirements of aircraft, which peaked in 2012. The trend is a broadly positive one for MRO suppliers because it implies that older airframes and engines, which require more maintenance than younger aircraft, remain in service longer.

There is, however, an impact on the availability of used parts and materials, which help independent providers to compete more effectively with OEMs. Operators and

Romanian MRO Aerostar recently carried out the first European A320neo C-check owners benefited from lower material costs as retirements increased, but these benefits are likely to decrease if current retirement levels are maintained. Richard Brown, principal, ICF, says: "The reduction in retirements has caused a reduction in feedstock of in-demand aircraft and engines with green-time remaining and [of] valuable surplus parts. We continue to see intense competition for part-out aircraft with an observation that some appear willing to overpay for assets (perhaps due to impatient private capital seeking a home)."

Engines getting more complicated

Engine OEMs have tended to be more involved in the maintenance of their products than airframe manufacturers and this involvement has increased as engine technology has become more complex (see *Airfinance Journal*, Guide to financing and investing in engines 2018). The introduction of the latest generation of narrowbody engines from CFM and Pratt & Whitney looks likely to increase further the manufacturers' participation in the maintenance of their respective engines.

The key difference between engine and airframe maintenance is that the cost of engine overhaul is dominated by the cost of parts, whereas airframe maintenance is labour-intensive. Estimates vary, but the industry consensus is that about 80% of an engine overhaul cost is attributable to the new parts required. Unlike providers of heavy maintenance for airframes, engine shops cannot compete by leveraging lower labour costs.

The role of surplus used parts is therefore even more influential in engine overhaul than it is in airframe maintenance. The engine manufacturers have largely succeeded in precluding the use of non-OEM parts-manufacturer approval (PMA) material, but the availability and use of surplus parts is more difficult for them to control. Despite the recent reduction in availability, the surplus parts market is about five times larger than the PMA market.

Asia-Pacific is biggest market

Reflecting the growth in air transport in general, the importance of Asia-Pacific to the MRO market is increasing. The region already accounts for 31% of MRO spending, according to ICF's analysis, and this is set to grow to 38% by 2027, states the company's forecast. North America is the second-largest market, accounting for 26% of current spending, but this is set to reduce to 18% by 2037.

In addition to the inherent demand in the region, industry estimates suggest that operators from outside Asia-Pacific send one-quarter of their widebody heavy airframe maintenance needs to the region. Some observers doubt that MRO capability in the region can be built up sufficiently to accommodate both types of demand, meaning operators will have to look elsewhere for their MRO needs, presenting opportunities in North America, western Europe and Latin America.

The MRO demand generated by the boom in aircraft deliveries in India has largely been met by providers outside of the country, but there are efforts to ensure more work is carried out domestically. For example, US company AAR has entered a joint venture with Indamer Aviation to set up a new MRO facility in Nagpur, which will initially comprise of six narrowbody maintenance bays.

Everybody is talking about data

With the advent of e-enabled aircraft, there is widespread consensus that access to the data they generate is key to providing MRO services and to gaining market share. There is little doubt that the importance of this access provides the aircraft OEMs with significant competitive advantage in their quest to increase their presence in the MRO market. Engine manufacturers probably have the economies of scale and market presence to maintain their already strong presence, but whether component and system manufacturers are able to maintain their presence and direct support to operators is more questionable.

The increasing number of mergers, acquisitions and partnerships in the MRO sector is at least in part driven by the need to establish organisations capable of adding value in the various aspects of data handling.

Financiers

Lessors and financiers are not the ideal customers for MROs because their requirements tend to be, if not unpredictable, sporadic. The majority of work is generated when leases are transferred and bridging maintenance is required. The task required can be difficult to predict, particularly if the aircraft is moving between regulatory regimes.

Airlines that provide regular business are not only more attractive in terms of potential labour-hours, but provide the opportunity to build up relationships. Lessors risk being viewed as secondary customers, but in a world where the percentage of aircraft on lease continues to increase, most MROs recognise that they need to build relationships with the lessors and other financiers.

Lufthansa Technik reports 5% sales growth

At its 2017 annual results briefing, Lufthansa Technik announced its sales revenue grew by €260 million ($320.8 million) to €5.404 billion from the previous year's €5.14 billion – a 5% increase.

The organisation, which has support contracts covering about 20% of the world's commercial aircraft fleet, is seen by many as a barometer of the maintenance, repair and overhaul market.

If this is the case, the signs are good. In addition to the sales growth, the company achieved an adjusted earnings before interest and taxes of €415 million, up from €411 million the previous year. Constanze Hufenbecher, chief financial officer, attributes the success to high levels of investment. "Since 2014, we have almost doubled our annual investments to €233 million and we plan to pursue this approach further," she says.

The company's focus on data is also a reflection of wider trends in the industry and Hufenbecher stresses that a significant amount of the investment is going to the development of digital platforms and solutions.

Manufacturers continue to open new markets

Regional OEMs are finding new operators, worldwide, for their aircraft.

ATR opened a number of new markets in 2017. The Franco-Italian manufacturer delivered to Iran Air, opening up a new market with significant potential for growth. ATR also delivered to Japan for the first time, with Japan Air Commuter (JAC), and signed comeback deals in the US with Silver Airways and with FedEx for brand new freighters. ATR also inked landmark letters of intent with Chinese carriers.

The manufacturer says more than 150 airlines opened new routes all over the world last year, with ATRs offering passengers more opportunities to connect for business and leisure. Airlines in the asia-pacific region opened the new routes of ATRs in 2017, though there was significant growth in ATR networks on every continent.

Embraer says that its E-Jets are being used in several business applications, not only regional, but also with mainlines and low-cost carrier operations.

In 2017, the E-Jet family reached the milestone of more than 1,400 aircraft delivered in the five continents, which together, are serving more than 3,600 markets (240 more markets than served in 2016) and accumulated more than one billion passengers transported worldwide since the first delivery back in 2004.

Bombardier says its operators are constantly launching new routes or increasing frequencies with its aircraft. At the same time, operators are on a quest for higher yields and are closing less profitable routes. Some routes are being up-gauged, other thinner routes are then being served by regional aircraft and small single-aisle models.

Between 2016 and 2017, operators opened about 600 new routes, says the Canadian manufacturer, with significant growth in China, Asia, India, Africa, Latin America and the CIS.

ATR sees huge development potential in China and India. Even accounting for the recent sale of 50 aircraft to Indigo, the manufacturer says there is still significant room for further growth in India.

The turboprop manufacturer predicts that India will need as many as 200 new turboprop aircraft in the next 10 years to match demand for development. In China, it sees the need for 300 new aircraft before 2035, which would lead to the creation of 800 new routes.

"This is a market where regional aircraft comprise only 2.3% of the entire fleet, while the global average is 25%. Thus, China desperately needs effective regional air connectivity and regional cargo to support its growing regional economies. We have the aircraft with the perfect economics to support Chinese operators to stimulate this growth," says Karine Guenan, ATR's vice-president leasing, asset management and freighter and customer and structured finance.

China offers a huge potential for regional flying, probably more around regional jets, argues Bombardier.

"If today the US regional system would be implemented in China, some 1,000 additional regional jets would be needed. We are at the beginning of a big change in China where regional aviation is becoming the backbone of air travel in the region," says Bombardier Commercial Aircraft senior vice-president of commercial Colin Bole.

Bombardier says North America and Europe are mainly replacement markets. Growth opportunities exist in many other regions, such as in Africa, where airlines realise the need to strengthen their domestic and regional flying before jumping to the operation of larger equipment. Connectivity in this continent continues to grow and airlines such as Ethiopian Airlines have become the regional champions for many countries beyond Ethiopia.

In South Asia, there is a growing appetite for larger turboprops and the 90-seat Q400 has gained interest, says Bombardier. In India, the Udan government initiative to boost regional flying is driving interest from airlines wishing to find the best compromise through high-density equipment and low costs.

Latin America is also recovering from years of economic downturn, says Bombardier, and new initiatives are taking place to re-establish services, in particular in large countries such as Brazil.

North America, and the US in particular, is another market where ATR sees significant potential for its aircraft where 400 routes have been lost in the past decade because of the economic inefficiency of ageing aircraft.

"Silver Airways' decision to introduce the ATR -600 series, following a deal with NAC, confirms their belief in the economics of our aircraft. We believe that following the entry into service of Silver Airways' ATRs, other operators will quickly realise the economic benefits to be gained from our modern turboprops, so some of this connectivity can be restored. Some 250 turboprops are over 15 years old in the US," says Guenan.

Bombardier notes fleet growth for many of its regional aircraft operators in mature and emerging markets over the past two years. The Canadian manufacturer says PSA, Endeavor, Skywest, Air Georgian (which operates as capacity purchase agreement operaters for Air Canada) have grown in North America, while SAS, Lufthansa Cityline and Air Nostrum have added aircraft in Europe. Growth in other parts of the world includes China Express, Cemair and Bolivian carrier Amaszonas.

Embraer says two meaningful examples of how E-Jets have been successful serving regional markets are companies such as Skywest, Horizon, Republic Airlines and Mesa in the US. In Europe, KLM-Cityhopper has replaced its entire Fokker fleet with E-Jets, enabling the carrier to serve more cities, in more profitable markets, such as London City (previously inaccessible to them).

"The E-Jets were also the pillar of network expansion in airlines like Aeromexico, British Airways, Austral, Colorful Guizhou, Japan Airlines and GX Airlines," says Embraer president and chief executive officer John Slattery. Fewer airlines have increased their turboprop fleets substantially over the past two years than their regional jet fleets.

Iran Air has gone from having no ATRs to operating eight in the space of one year. Braathens (BRA) is another example of an operator that has progressively increased its fleet, says ATR – the Swedish operator has nearly doubled its fleet size to 13 ATR72s.

"What we have seen over the last two years is an increase in new ATR operators, such as Iran Air, Indigo, JAC, Mandarin Airlines, Eastern Airways or Air Senegal, plus others, like Silver Airways, which will become new operators soon," says Guenan.

ATR says the ATR72-600 has a fuel burn advantage of 40%, a trip cost advantage of 20% and a seat cost advantage of 10% versus the Q400. "These figures clearly show the economic benefits of the ATR and contribute to the aircraft having the leading market share within the regional aviation segment," adds the European manufacturer.

"The Q400 has been made for harsh environments: longer range, heavy schedules, hot and high. With more seats and extra productivity, there is tremendous benefits for airlines."

Colin Bole, commercial aircraft senior vice-president of commercial, Bombardier

Westjet Encore and Porter Airlines are prime examples in North America for growth with Q400s, while in Europe SAS, Aurora and Air Iceland Connect have added the Q series. Notable additions include Spicejet and PAL Express in Asia-Pacific and African carriers Ethiopian Airlines and Cemair.

"The Q400 has been made for harsh environments: longer range, heavy schedules, hot and high. With more seats and extra productivity, there is tremendous benefits for airlines," says Bole.

The Canadian manufacturer adds that its Q400 has the lowest cost/seat and highest productivity of any other turboprop in the market. Combined, it says these two factors offer incredible economic advantages.

Bombardier argues that the low-cost and dependability of the CRJ series are what airlines appreciate the most.

"The CRJs are cheap to operate. Even the new generation of re-engined regional jets cannot beat the CRJ economics. It is also very reliable, which means high utilisation. It offers piece of mind and, simply put, is a great money-making machine," says Bole.

"When we look specifically to the E175, it has around 5% lower operating costs when compared to the CRJ900, represented mainly by the lower fuel burn as well as its lower maintenance cost," argues Embraer. "However, it has multiple other advantages, like 25% more range, around 20% lower takeoff/landing field length and a superior cabin comfort. Those advantages gave to the E175 the leadership of 76-seats segment with more than 80% of the market share in the United States and 70% worldwide."

Leasing potential

The lessor community finances about one-third of the Embraer global fleet. "I believe that's a solid percentage," says Slattery. AerCap, Aircastle and ICBC are the three lessors that have committed to the E2 orderbook.

"Our strategy is clearly defined and we don't believe that you should have too many lessors with speculative orders at any one time in our segment of the market. On a mature basis, you probably want approximately 25% of your delivery stream with lessors. For larger jets, that percentage can be a little higher," he says.

Embraer works with lessors closely as partners and its sales force does not distinguish a new aircraft direct sale versus supporting a lessor placement of a new aircraft, says Slattery. "I believe we are somewhat unique in that mindset and philosophy. It aligns Embraer's interests optimally with those of our lessor partners."

He expects plenty of news in the next couple of quarters on fleet placements by the lessors of the E2s as "we cadence into final type certification in the coming weeks".

Leasing is a key market for ATR, as proved by the success of a series of speculative lessor placements since 2011. The manufacturer sees lessors representing about 25% of its backlog, offering a well-balanced opportunity to enter new markets while providing operational flexibility and diversification to its operators.

"We also see future potential and interest from Asian lessors, which will further support a breakthrough for ATR sales in mainland China," says Guenan.

Bole says North America and Europe are still the largest regional markets in the world, despite a rising demand in China. Bombardier sees great opportunities with leasing companies. "We are working closely with lessors to manage supply and demand responsibly to ensure long-term value. As an example, less than 20% of the Q series fleet is leased, whereas more than 30% of our competitors' fleet is leased," he says. According to Bole, lease rate factors in the large regional aircraft market (60 to 99 seats) are holding up much better than in the large single-aisle segment (150 to 220 seats).

"Availability of delivery positions for large single-aisle aircraft are not until 2023 and beyond, so any leasing company looking for near-term growth opportunities should take a look at the regional market," he adds.

Secondary market

In the secondary market, Bombardier's products are considered liquid and in demand and the manufacturer's pre-owned inventory is at an all-time low, says Bole.

"The Q400 is well distributed with two-thirds of the fleet in mature markets with a growing footprint in Asia and other developing regions. In 2017, only 2.8% of the fleet was stored while our competitors were closer to 9%," he adds.

Between 2012 and 2017, 75 CRJs were sold outside the US, with nine out of 12 operators based outside that country.

Pre-owned Bombardier aircraft are also sought after by regional cargo feeders and air cargo operators. More than 15 CRJ200 aircraft have been converted to either package freighter (PF) or special freighters (SF). With vintages of 15 years and older entering the market, the Q400 PF is also gaining strong interest, says Bole. Embraer has been very successful in the secondary market, too. The placement of pre-owned aircraft, as they naturally come off lease from their first or second leases, allowed the manufacturer to expand its operator footprint.

> *When we look specifically to the E175, it has around 5% lower operating costs when compared to the CRJ900, represented mainly by the lower fuel burn as well as its lower maintenance cost.*
>
> **Embraer**

Slattery says about 2.5% of the fleet installed is available for sale. "It is a pretty healthy level, but, in the end, represents a unique advantage for Embraer to look for new opportunities. In 2017, we added five new operators to our customer base – Airlink, S7, Georgian Airways, Buta Airways and Fastjet," he adds.

Guenan says there are interesting opportunities for ATR operators to use legacy aircraft for a variety of operations. She says the ATR72-500s still retain more than 50% of their original value after 10 years of operations and offer competitive economics that will be interesting to certain operators for passenger operations.

The ATR72-500 model is an excellent candidate for passenger-to-freighter (P2F) conversions, she says.

"Furthermore, there are more than 300 ATRs which are older than 20 years old, while in terms of feedstock in the 10- to 20-year-old range, there are only 200 ATR -500s. This does not account for other turboprops, which would further emphasise this disparity between the used-market supply and demand. We therefore expect to see a strong demand for mid-age ATR -500s in the near future."

ATR recently created a freighter, leasing and asset management division that offers a one-stop-shop to support the transition and acquisition of its aircraft on the secondary market – using its market acumen to lessen the financial impact on operators seeking this kind of investment opportunity.

Airfinance Journal's 2017 deals of the year awards

Airfinace Journal **reveal the winners of our prestigious annual Global Awards and China Awards, recognising the most innovative deals, individuals and teams in aviation finance.**

Aviation finance house of the year: **Citi**

This year marks the first time *Airfinance Journal* has recognised the aviation finance house of the year. The award is for the financier that has made the biggest contribution to the industry over the year. Several top-tier aviation banks submitted applications for the award and deciding on a winner was a difficult decision for the judges.

Citi wins this year for finding a spectrum of financing solutions for its clients and for being active in all the key aircraft financing markets. The US-based bank was involved in $65 billion of aviation sector transactions over the course of 2017, including $23.7 billion of bank debt, $32 billion of debt capital markets, EETCs ($3.5 billion), asset-backed securitisations ($2.4 billion), equity ($2.2 billion), and M&A ($708 million).

Not only did the bank support airlines, it also financed many leasing companies and airports, including a $4 billion financing for Mexico city airport.

"We are most proud of the depth and breadth of our business with the airlines and aircraft lessors around the world. Given our unique global footprint, with branches in over 100 countries, we have close client relationships locally," said Thomas Hollahan, managing director and Citigroup's global aviation industry head.

The **Citi** team, collecting their award

"Through these relationships, we offer our clients the full suite of debt and equity products as well as best-in-class strategic advisory services. In all of these markets Citi is ranked number one or close to number one."

Hollahan says this is the result of the bank's close client relationships and its strong product positioning in the $65 billion of financing Citi raised for the industry in 2017.

"We are very proud that we have now moved to number one in the league tables for EETCs, to go along with our historically dominant positions in other markets such as airline IPOs and airline and aircraft lessor unsecured public debt. We are also proud of our leadership position in arranging syndicated bank revolving credit agreements for airlines and airline lessors on a global basis, most recently with the Cathay deal," he says.

The $350 million Cathay used aircraft revolving credit facility (RCF) was the first secured RCF for an Asian carrier. Despite the average vintage of target aircraft being approximately 22 years, the deal was successfully distributed – with $500 million in commitments from over 10 financial institutions. The secured RCF structure has been used on a flexible pool of vintage aircraft for other airlines, including British Airways and Virgin Atlantic.

Lessor of the year: **Avolon**

Avolon has been a major player in the merger and acquisition field over the past few years and its $10.4 billion acquisition of CIT Aerospace propelled the HNA-owned lessor to the top of the leasing table.

CIT Aerospace also helped to balance Dublin-based Avolon's portfolio, 40% of which previously operated in Asia (not including China). Post-merger that share has dropped to 28%, while Avolon's North American allocation has risen to 19% from 9%. The proportion of aircraft operating in Europe, Latin America and China remains broadly stable at 21%, 13% and 8%, respectively.

At closing of the merger (April 2017), the new entity served 149 customers in 62 countries with approximately one-third of in-service aircraft leased into each of the Americas, EMEA and Asia-Pacific regions, providing balanced geographic exposure.

The benefits of the acquisition of CIT's aircraft leasing business were reflected in Avolon's 2017 figures, which saw full-year net profit increase by almost 60% to $550 million. Avolon posted revenue of $2.37 billion for 2017, up from $1.04 billion in 2016.

By the end of 2017, Avolon's owned, managed and committed fleet had more than doubled to 908 aircraft. During the 12-month period, Avolon sold 44 aircraft and received 107 aircraft, including the delivery of 45 new aircraft.

"We are a stronger and more strategically relevant business than at any time in our history. We have the team, the balance sheet and the aircraft orderbook to deliver for our customers and all our stakeholders in 2018 and beyond," said Avolon's chief executive officer, Dómhnal Slattery, at the time.

Avolon raised $14.9 billion of total debt and equity capital, including $9.75 billion of debt raised in the public capital markets, during 2017. It had $15.7 billion future contracted rental cash flows at year-end.

The lessor closed the year with $5 billion in cash and undrawn credit to protect it from any fallout from its Chinese parent's difficulties.

Last year Avolon also secured an investment grade rating from Kroll Bond Rating Agency. The rating agency assigned an issuer rating of BBB+ and a senior unsecured debt rating of BBB to Avolon. The outlook on the ratings is stable.

The rating agency said the BBB+ issuer rating of Avolon reflects the strength of the company's leading market position, seasoned management team, young and in-demand fleet, focus on lowering and maintaining relatively low leverage, as well as a staggered and diversified funding profile.

M&A deal of the year: **GECAS sidecar vehicle**

Borrower/Issuer: Einn Volant Aircraft Leasing

Structure: Caisse de dépôt et placement du Québec (CDPQ) and GECAS created a $2 billion aircraft financing platform. CDPQ provided 90% of the equity, GECAS 10%

Amount: $2 billion

Asset financed: Airbus A320s and Boeing 737s

Lawyers (and role): A&L Goodbody, Irish counsel to GECAS. Clifford Chance, US counsel to GECAS. Milbank Tweed Hadley & McCloy, US counsel to CDPQ. Walkers, Dublin, Irish counsel to CDPQ

Advisors: Goldman Sachs and Bank of America Merrill Lynch advised GECAS on the transaction. E&Y provided tax advice

Date mandated: August 2016

Date closed: November 2017

GECAS' $2 billion sidecar vehicle, Einn Volant Aircraft Leasing (EVAL), a joint venture with Canada's second largest pension fund manager, Caisse de dépôt et placement du Québec (CDPQ), wins *Airfinance Journal*'s 2017 M&A deal of the year award.

The EVAL platform is an innovative venture that provides GECAS with the flexibility to finance future growth while serving as an entry point for CDPQ into the aircraft leasing and financing industry. "This platform will provide financing solutions to airlines to help support the growth of their fleet and answer essential industry needs. The high-quality aircraft will be chosen for their ability to withstand short-term cyclicality in a sector underpinned by strong long-term growth drivers," said Michael Sabia, president and chief executive officer of CDPQ, when the deal first hit the market.

"Through this platform, CDPQ's stable capital and GECAS' extensive expertise and network will combine to identify the best opportunities globally. Working with world-class operators such as GE is a fundamental part of our investment strategy, and this announcement is yet another example of this strategy in action."

Goldman Sachs and Bank of America Merrill Lynch advised GECAS on the transaction. EVAL will buy and lease back modern fuel-efficient aircraft from a diverse set of global airlines under long-term leases.

GECAS will source the transactions and, under certain conditions, will invest in aircraft ownership opportunities alongside the platform to further align its interests with those of EVAL. GECAS will also act as servicer for the platform.

Laura Mueller *AFJ's managing director* and The **GECAS** team, collecting their award

Best airline of the year: **Delta Air Lines**

Delta Air Lines beat strong competition from its US competitors to win the Airline of the year award for 2017. The award was based on return on invested capital (ROIC) as recorded by The Airline Analyst (TAA). TAA includes financial data for more than 200 airlines, with more being added all the time.

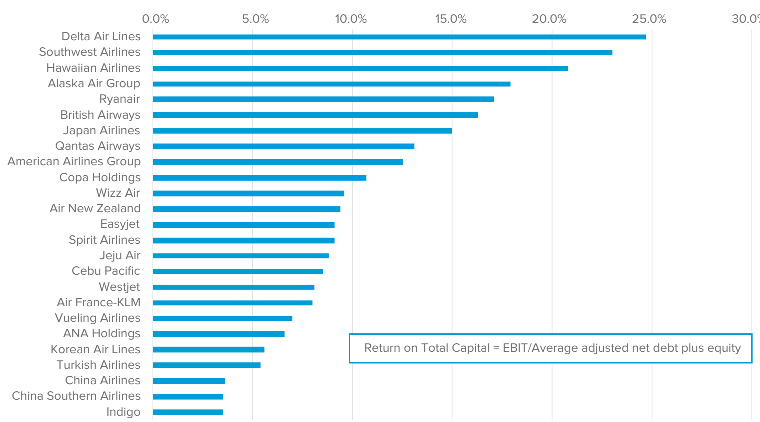
As can be seen from the chart, the top four ROIC performers were all US airlines. Ryanair came fifth as the top non-US carrier, followed by British Airways and Japan Airlines.

Delta has worked towards ROIC goals for many years, using a disciplined cost structure and balanced capital deployment. The success of this strategy contributed to its investment grade rating in 2016. Delta has now returned $10 billion and repurchased approximately 16% of the outstanding shares of the company while reducing debt by $9 billion. Ebit (earnings before interest and tax) margin in the meantime has doubled from 7.1% in 2012 to 14.2% in 2017.

The airlines in the chart represent the cream of the crop, although it is noticeable how fast airline returns drop away to single digits, which questions whether all of the top 25 – and the wider market – are earning returns in excess of their cost-of-capital.

Notably under-represented in the chart are airlines from the fast-growing Asia-Pacific market and from Latin America. Nevertheless, Delta clearly generated positive shareholder value and is to be congratulated on an outstanding achievement. We will see if any of 2017's challengers can up their game and run Delta even closer in 2018.

Return on total capital 2017 - Top 25



Source: *The Airline Analyst*

Airline treasury team of the year: **Gol Linhas Aereas**

Brazilian carrier Gol Linhas Aereas won the prize this year as investors bought into the company's turnaround story.

In July 2016, Gol carried out a distressed debt exchange under which investors holding $41 million of its 2022s agreed to swap their bonds for just $70 of cash and $380 of new 9.5% 2021s per $1,000 exchanged. Holders of other Gol bonds took similarly hefty haircuts, though the take-up on the exchange was low across the curve.

Eighteen months later, the Brazilian real had stabilised and the economy had exited its worst recession. Furthermore, Gol went through a restructuring that included cutting routes, negotiating with lessors to return 20 aircraft, and selling other jets.

With market conditions as strong as most bankers had seen, Gol – still rated Caa3/CCC+/B but with an upgrade from S&P imminent — was thus able to issue its largest-ever deal at its lowest-ever yield in December 2017.

Gol was looking to price at least $350 million of new bonds, but left open the option to increase the size. After receiving $1.35 billion of orders, the company was able to bring guidance in to 7.375% before launching a $500 million deal at 7.25%.

The transaction was followed by an additional $150 million issuance at 7% in January 2018.

Last year Gol was upgraded by all three major rating agencies.

Fitch and S&P raised its credit rating twice, ending the year at 'B', stable outlook, and 'B-', positive outlook, respectively. In December, Moody's upgraded Gol's corporate credit rating by four notches to 'B2', stable outlook.

This was clear evidence that the market begun to acknowledge Gol's improved credit profile.

Last December Gol also managed to buy back two-thirds of its 8.875% senior notes due in 2022.

By the offer's deadline on 6 December, subsidiary Gol Finance had received valid tenders for $185 million of the notes from an aggregate principal amount of almost $277 million. The tender offer was launched on 27 November, with note holders offered $1,065 for each $1,000 principal amount of notes, plus accrued interest.

Gol Finance engaged Credit Suisse Securities (USA); Merrill Lynch; Morgan Stanley; and BCP Securities to act as the dealer managers.

In 2017 Gol's Ebitdar margin was an impressive 23%, up from 21.7% in 2016.

The balance sheet continued to strengthen: adjusted net debt was 6x the last 12 months' Ebitdar in the fourth quarter of 2017, compared with 7.5x in 2016.

At 31 December 2017, total liquidity, including cash, financial investments, restricted cash and accounts receivable, totalled R$3.2 billion ($912 million), an increase of 66% from a year earlier.

Lessor treasury team of the year: **AerCap**

A year after being upgraded to investment grade rating by two rating agencies, operating lessor AerCap secured the third and final major rating agency, Moody's, as investment grade rating last year.

During 2017, the lessor continued its strategy to diversify financing and issued on the unsecured basis, via its subsidiaries, a total of $3 billion of new debt in three transactions with different terms.

The January $600 million five-year senior unsecured notes priced at 3.5% while the July 10-year $1 billion unsecured notes priced at 3.65%. Another 10-year transaction raised $400 million in new debt. In November another $800 million unsecured transaction priced at 3.5% with an eight-year term.

"We continue to lengthen the average tenor of our debt. Our last four unsecured bond deals raised $3 billion at attractive rates with a five-year, a seven-year and two 10-year maturities," said chief executive officer Aengus Kelly. AerCap also re-priced more favourably several deals in 2017.

It upsized and extended its $3 billion unsecured revolving credit facility. The new facility, which has an accordion feature permitting increases to a maximum size of $4 billion, totalled $3.75 billion in February and included a four-year revolving period to February 2021.

The interest rate was reduced by 0.5 percentage points to a base rate of Libor plus a margin of 1.5%. That facility was again upsized to $3.895 billion in September.

In December 2017, the amount available under its AIG revolving credit facility was reduced to $200 million from $500 million and the maturity of the facility was extended by six months to October 2019.

During the year AerCap also extensively continued its shares repurchase programme with its board of directors approving more than $1.1 billion in share repurchases.

AerCap maintained a very strong liquidity position. At the end of the year, available liquidity totalled $9.6 billion and combined with the lessor's operating cash flows, total existing sources of liquidity stood at $12.8 billion.

This represented 1.4 times AerCap's cash needs over the next 12 months and cover at least 1.2x of its debt maturities and contracted capital requirements for the next 12 months.

AerCap's debt was $28.4 billion as of 31 December, 2017 and its adjusted debt to equity ratio was 2.8 to 1.

The lessor's net spread was 9% for the year. In addition to the decrease in average age, the other factor that impacted its net spread for the full year was the increase in its average cost of debt from 3.7% to 3.9% as the lessor continued to issue new longer-term bonds that replaced expiring shorter-term ILFC notes.

2017 was another year of strong operating and financial performance for the company. It completed 402 aircraft transactions, more than one a day. AerCap improved the quality of its fleet by selling $2.4 billion of mid-life and older aircraft, and taking delivery of 58 new aircraft.

The Aercap treasury team was led by Paul Rofe, who retired on 31 December 2017.

"Paul has played a key role in the success of AerCap, including the ILFC acquisition and the raising of over $50 billion of funding during his tenure from a wide range of financial institutions and investors. We thank him for his outstanding service and wish him well in the future," said AerCap's chief executive officer Aengus Kelly.

Aviation finance person of the year: **Bob Morin – Marsh**

The June 2017 departure of Robert Morin from Export-Import Bank of the United States (Ex-Im Bank) to join Marsh and work on the Aircraft Finance Insurance Consortium (AFIC) product was not surprising: Ex-Im had been shut since June 2015 and there was little hope that the bank would resume its activity for commercial aircraft transactions of more than $10 million.

Moreover, it also announced the return of Morin to his preferred activity: aircraft financing.

Having joined Ex-Im in December 1992 as transportation division (the predecessor of aircraft finance division) counsel, he was named vice-president in 1998 and attracted a skilled team of loan officers.

Morin has been involved in more aircraft financings than anyone else in the industry. During his time at Ex-Im, the bank provided over $100 billion of financing support for the export of more than 2,000 commercial aircraft, business aircraft and helicopters.

Morin, who served under five US presidents during his time at Ex-Im, was an architect of the government agency's aircraft financing programme.

He was instrumental in the design, development and implementation of many of Ex-Im Bank's most successful product and process innovations, some of which became industry standards. These include the Ex-Im Bank-guaranteed bond programme, which has enabled Ex-Im to access new sources of funding under its guaranteed financing programme.

Other innovative structures engineered by Morin include SOAR loans, jet-fuel indexed Ex-Im Bank-guaranteed loans, rupee/dollar swapped Ex-Im Bank Loans and certain capital markets structures.

"Bob Morin is one of the most knowledgeable, well-known and respected professionals within the aircraft finance industry," said Ex-Im Bank chairman and president Fred Hochberg in 2014.

His next challenge is to oversee the expansion of AFIC, an insurance-guaranteed product launched by Marsh and designed for bank and capital market investors that fund new aircraft purchases from Boeing.

AFIC provides an alternative financing product for new aircraft deliveries

Bob Morin and **Kostya Zolutusky**, *managing director at* **Boeing**

and is underwritten by four insurance companies: Allianz; AXIS Capital; Fidelis; and Sompo International (formerly Endurance). The insurance protects the lender's exposure to default for the duration of the loan. The terms of this insurance can be tailored to the individual purchase agreement made between Boeing, an airline, and its financiers.

Morin is *Airfinance Journal*'s person of the year for closing more than $1 billion of AFIC guaranteed aircraft financings in its first year of operation.

After financing Boeing aircraft for most of his life, could Morin support Airbus aircraft soon?

Lifetime achievement award: **Scott Scherer**

Scott Scherer is the winner of *Airfinance Journal*'s lifetime achievement award for his dedication to the aviation finance sector and notably the Cape Town Treaty, which is intended to standardise transactions involving movable property on the international stage.

Scherer helped to found the Aviation Working Group (AWG), an international industry organisation dedicated to developing policies and regulations to facilitate advanced aviation financing. Under Scherer's leadership as co-chairman, the AWG led a successful effort to develop and ratify the Cape Town Treaty. The treaty seeks to reduce risks for creditors and, consequently, the borrowing costs for debtors, by reducing legal uncertainty.

Previously Scherer led an industry coalition in successful efforts to amend Section 1110 of the US Bankruptcy Code to improve the ability of US airlines to raise aircraft financing.

He also played a leading role in negotiating a new Aircraft Sector

Scott Scherer and **Kostya Zolutusky**

Understanding (ASU) agreement. This international agreement establishes the terms and conditions that export credit agencies offer in support of the sale of their respective countries' aircraft.

Scherer most recently served as the senior executive focused on policy and regulatory strategies associated with the aircraft financing mission of Boeing Capital Corporation (BCC). He was responsible for arranging, structuring and providing financing solutions to customers of Boeing products. He was appointed to this position in December 2009.

In the role, Scherer developed and oversaw BCC's interactions with industry and government stakeholders regarding the laws, rules, regulations and policies that shape aircraft financing's infrastructure.

Previously Scherer had served as vice-president and general manager for BCC's Aircraft Financial Services organisation, a position he held since early 2000, laying the groundwork for much of the company's current success with aircraft financing infrastructure matters.

Before that role, he was vice-president of customer financing for Boeing. Previously, he served as director - finance and business management for Boeing's 737/757 programmes and as assistant treasurer – customer financing. Scherer has worked in the customer financing sphere since 1977.

Scherer holds a bachelor's degree in economics from Texas A&M University. He also participated in the business administration programme at Seattle University.

Best new chinese leasing entrant of the year 2017: **CMIG Aviation Capital**

CMIG Aviation Capital (CMIG AC), a subsidiary of China Minsheng Investment, impressed our judging panel with its rapid growth over a short period of time.

From the day its business licence was obtained in April 2017 until the end of 2017, CMIG AC's team had less than eight months to win mandates for more than 30 aircraft. At year-end, it had closed deals for 18 of them worth over $1.1 billion, according to the lessor's Inaugural China Awards application.

The company ended 2017 with a balance sheet of more than $1.4 billion, comprising mostly aircraft on operating lease via both offshore and onshore structures, the fastest-ever growth achieved by a new Chinese lessor. Its portfolio comprised 18 aircraft leased to 11 airlines in eight countries with an average age of 2.6 years, and with average effective lease term of over nine years.

Each of the 18 aircraft is financed by a combination of equity and third-party debt, with long-term debt accounting for more than 80%. The lessor has been exploring new forms of financing, notably in the Korean market. In early 2018, CMIG Aviation Capital tapped two Korean banks for the financing of an Airbus A330-300 on lease to Sichuan Airlines, about $100 million. CMIG Aviation Capital's chief executive officer, Peter Gao, says his company saw plenty of appetite in the Korean market and so decided to spend a significant amount of time last year working with Korean investors.

"We are talking to more Korean investors about how we can raise money for our aircraft deliveries," he says.

He adds that Korean investors typically choose top-tier names such as Emirates Airline or Singapore Airlines, but CMIG Aviation Capital won them over to Sichuan Airlines by doing a lot of work with them together to make them comfortable to accept the credit of Sichuan.

Gao says: "They felt happy about that, and the next step might be: are they willing to accept more different names in the Korean market? That's the main reason we go to Korea so often: because we believe they have appetite, they have money and they just need to learn more lessons, in a good way."

The **CMIG Aviation Capital** team, collecting their award

Chinese lessor of the year 2017: **CDB Aviation**

CDB Aviation has undergone a transformation since chief executive officer Peter Chang took the helm in January 2017.

The wholly owned Irish subsidiary of China Development Bank Financial Leasing is "built on a strong, secure and resourceful financial foundation", according to the company's submission for the Inaugural China Awards.

"CDB Aviation is a customer-centric, relationship-driven organisation where an industry-leading team understands an aircraft lease is not simply a single transaction of an airplane lease, [but] rather an engagement and understanding recognising airlines' fleet needs are specific and ever-changing."

In 2017, CDB Aviation executed transactions for 162 aircraft, including deliveries of 38 new aircraft to 15 airlines in nine countries. It sold 19 aircraft and placed orders for 105 new aircraft, including 45 Airbus A320neo-family aircraft, 52 Boeing 737 Max aircraft and eight 787s. At the end of 2017, its fleet comprised 215 owned and managed aircraft on operating or finance leases, as well as 184 committed aircraft in its forward orderbook with Airbus and Boeing.

Speaking to *Airfinance Journal* on 7 May, Chang said that, in January 2018, when he was last interviewed by *Airfinance Journal* everything was "conceptual".

"There were a lot of inspirations and visions and things without real material substance. It was just a hope and wish list. Since that time, we have now achieved almost all of the important pieces and have clear sight on our next objectives," he adds.

Chang says CDB Aviation's headcount has now reached 94, which includes senior executives appointed to head its Americas and Asia-Pacific teams. Its legal department has grown from one to seven lawyers.

Chang says that the goals of 2018 are "less tangible" than last year, and that 2017 was about "survival".

"It's kind of like Swiss Family Robinson. When they got stranded on the beach, the first order of the day is to build a house with a roof. So we've passed that: we have our roof, we have our team.

"The second year is not as tangible, but it's just as important, if not more important, and that has to do with making sure that we put the people with the right skill set in the right places. I've found that's tougher than it sounds. In the end, we will succeed because of our ingenuity and teamwork."

CDB Aviation boosted its operating lease business in 2017 vis-à-vis its finance lease business. A filing by the lessor's listed parent, CDB Leasing, shows finance lease income dropping 1.2% to Rmb224 million ($36 million) in 2017 from Rmb227 million in 2016. However, operating lease income for aircraft leasing rose 10.1% in 2017, with CDB Leasing reporting Rmb5.76 billion in operating lease income last year, compared with Rmb5.23 billion in 2016.

CDB Leasing says this is primarily because of an expansion of the scale of aircraft for operating lease in light of the expansion of aircraft leasing business by the group and the stable gross lease yield of aircraft leasing business".

Top rated Chinese airline of the year 2017: **Spring Airlines**

Spring Airlines, which has its headquarters in Shanghai, was the first low-cost carrier in China. It was launched in July 2005 and closed its initial public offering (IPO) in January 2015. As of 18 May 2018, the airline had a market capitalisation of Rmb33 billion ($4.3 billion). Its fleet size numbers 79 aircraft with an average age of 3.8 years. Load factor has been above 90% since at least 2011.

The airline also has a subsidiary in Japan. It partnered with Japanese investors in 2011 and established Spring Airlines Japan with a 33% stake. In 2013, Spring Airlines Japan received approval from Japanese aviation authorities and started operations in August 2014 with a fleet of four Boeing 737-800s. In December 2014, the airline increased its stake in Spring Airlines Japan to 48%. As of 31 December 2017, Spring Airlines held a 34% stake in Spring Airlines Japan. The current operating fleet comprises six 737-800s.

Spring Airlines is a 63% subsidiary of Shanghai Spring International Travel Service, the largest private travel company in China. Based at Hongqiao International airport, the airline provides services to more than 90 destinations in mainland China, Taiwan, South Korea, Thailand and Japan.

Last year's revenue grew 30% to Rmb11 billion and earnings before interest, taxes, depreciation, amortisation, and restructuring or rent costs (Ebitdar) to Rmb2.4 billion. Ebitdar margin was a commendable 21.8%, though lower than the record level of 28.9% achieved in 2015. Spring's fixed charge cover was 2.3 times. As of 31 December 2017, its unrestricted cash balance was Rmb4.3 billion, or 39% of the total revenues, enough to cover 5.5 months of Ebitdar expenses and aircraft rental. Leverage as measured by adjusted net debt to Ebitdar improved to 4.6 times from 5.3 times in fiscal year 2016. Net income was Rmb1.3 billion and return on equity was 16%.

Because of its high ratings across five key parameters – average fleet age, Ebitdar margin, fixed charge cover, liquidity and leverage – Spring Airlines is the highest-rated Chinese airline in *Airfinance Journal*'s Financial Ratings for 2017. In an interview with *Airfinance Journal*, its deputy general manager, investment and finance department, Tian Chao, says a lot of factors contributed to these results.

Chao says that travel demand has been growing continually in recent years, noting that the THAAD (terminal high altitude area defence) dispute between South Korea and China, which reduced travel demand between the countries in 2016, got much better in 2017, especially in the second half.

Chao says Spring Airlines moved some aircraft from Asia-Pacific routes into the Chinese domestic market.

"Besides the traditionally hot flights from Beijing, Shanghai, Guangzhou, Shenzhen and Chengdu, also last year we developed a certain amount of flights in the middle and western parts of China. That covers quite a number of second- and third-tier cities," he says.

Chao says Spring Airlines continues to add aircraft.

Spring Airlines chairman Wang Yu says this will help the airline capitalise on China's increasing domestic and regional demand for leisure and business air travel.

Aviation woman of the year 2017 in China: **Li Ling, Bocomm Leasing**

Bocomm Leasing's global head of aviation, Li Ling, was chosen as *Airfinance Journal*'s Aviation Woman of the Year in China based on voting by three industry judges.

Li, who is the first recipient of the award, graduated from Shanghai Jiaotong University in 2000 with a master's degree in management science and a dual-bachelor's degree in international finance and computer science. That year, she joined Shanghai Airlines and was later promoted to general manager of the airline's planning division, becoming the youngest general manager of fleet planning among Chinese airlines.

She describes her role at Shanghai Airlines as challenging because the planning division had numerous responsibilities. "Normally, in Chinese airlines, the planning division is in charge of planning the type, number and schedule of aircraft introduction, purchasing aircraft, the operating lease of aircraft and getting governmental approval, and the finance division is in charge of the financing of aircraft and arranging hedging for interest and currency risk, so it is split," she says.

Li Ling, global head of aviation, Bocomm Leasing

"At Shanghai Airlines, our division was in charge of planning, getting approval, purchasing, leasing, configuring, financing and hedging. Everything needed to be arranged by us."

In 2010, Li joined Bocomm Leasing to lead the aviation division, which marked the beginning of the rapid development of the company's aviation leasing business. In the same year, Bocomm Leasing successfully operated the first aircraft-leasing project in the Shanghai Free Trade Zone (FTZ), and began operations in Ireland the following year.

Under Li's leadership, Bocomm Leasing's team has achieved a series of breakthroughs, including: the first aircraft leasing project in the Shanghai FTZ; the first operating leasing project from the Tianjin Airbus production line in the free-trade zone; the first domestic yen- and euro-denominated leasing project; aircraft delivery from its own orderbook; aircraft trade-out; vintage aircraft leasing; aircraft freighter conversion; third-party aircraft leasing; and US dollar and euro fundraising.

Li says that while China offers equal opportunities for women and men in aviation finance, sometimes women can utilise their unique skill sets.

"Introducing aircraft is a big deal with many details which can affect the final result, and sometimes women are more careful than men. I think that's why in the very early stage of my career I was noticed by my leaders as I tried to understand more," says Li. "Later, I was given more responsibilities, which increased my professionalism and leadership."

Asked for her advice for more junior Chinese women looking to succeed in the aviation finance industry, Li says not to put emphasis on gender differences.

"Just work hard, learn more and think more. It's a very interesting industry and you need to have passion," she says.

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A&L Goodbody
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Activities: Residual Value Insurance
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Job title: Senior Underwriter RVI
Email: nhester@qregroup.com
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Qualified Technologies Corp
Website: www.QTC.aero
Activities: Repair & Overhaul of ECS, Oil Coolers, Hot Air Valves, and other associated subsystems
Address: 2133 Aviation Drive, USA
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Raven Capital Management
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Activities:
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Reed Smith
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Residco
Website: Residco.com
Activities: Aircraft Leasing
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Revima
Website: www.revima-group.com
Activities: Maintenance, repair & overhaul
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RPK Capital
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Sanad Aero Solutions
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Sanne Group
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Activities: Financial Services
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Santos Dumont Aviation
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Scope Group
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Scope Ratings GmbH
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Seabury Capital
Website: www.seaburycapital.com
Activities: Investment Banking & Advisory Services, Financial Asset Management, Aircraft Technical Asset Management, Financial Services & Trading,IT & Enterprise Software
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Seraph Aviation Management
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SES (Shannon Engine Support)
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Shannon Group
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Shinsei Bank
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Shook Lin & Bok
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Silveroak Legal
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Simplex Legal
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Simulator Equipment Financing
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Smith, Gambrell & Russell
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Swiss Aviation Consulting
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Sysco Leasing Software
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TAAG Angola Airlines
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Tilleke & Gibbins
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TMF Group
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TrueNoord
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Activities: We serve the needs of regional airlines, providing fully financed leasing solutions for both new and used aircraft. We specialise in ATR, Bombardier and Embraer types.
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