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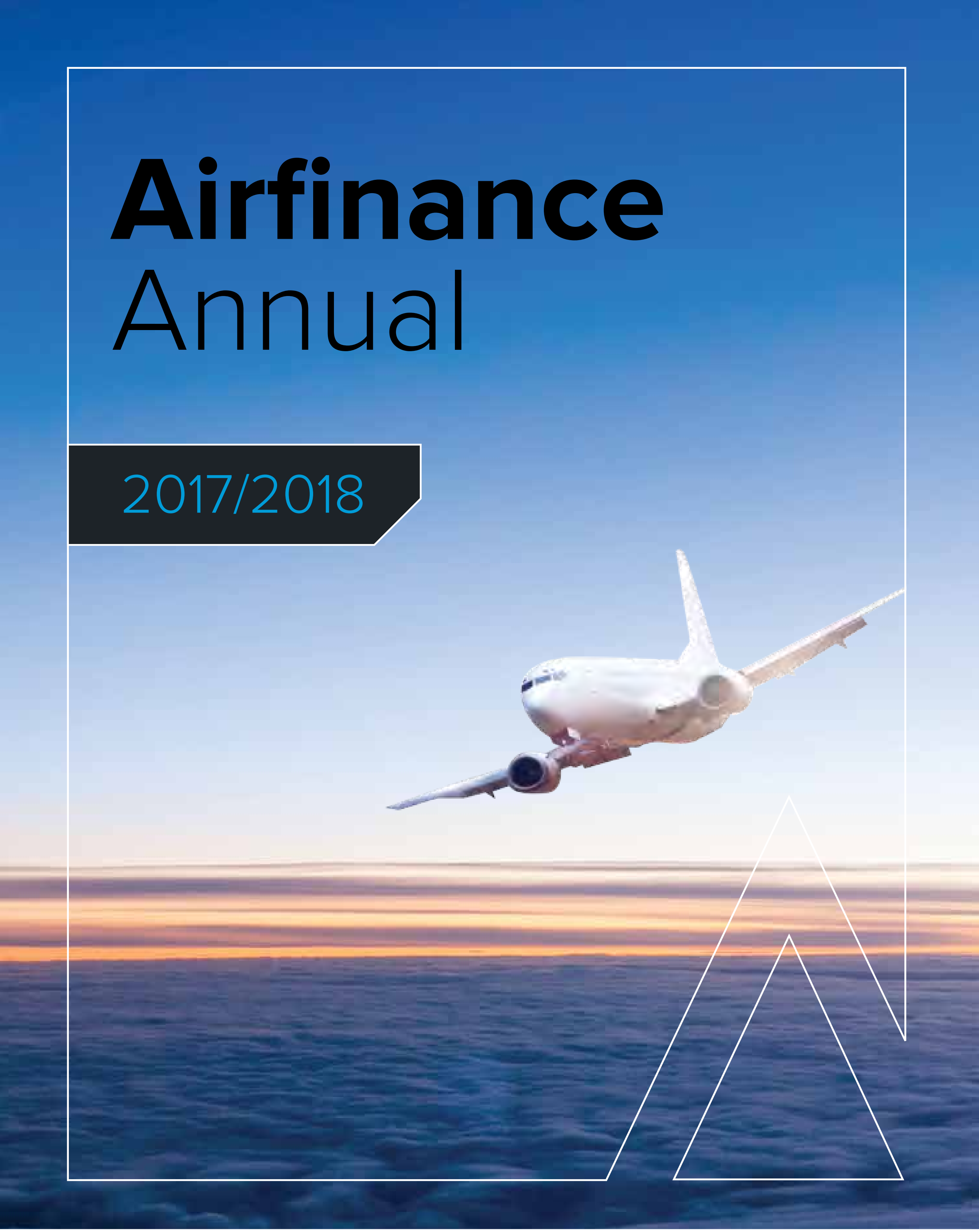

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This is expected to be another solid year for the airline industry. Demand for passenger and cargo aircraft continues to rise and revenues are expected to reach $743 billion, against a previous forecast of $736 billion.

Global airlines are expected to make $31.4 billion in profits in 2017, according to the International Air Transport Association (IATA). This is a revised profit forecast from $29.8 billion.

The past few years have seen an improved financial outlook for airlines. IATA expects 2017 to be the eighth year in a row of aggregate airline profitability.

The organisation adds that 2017 will be the third consecutive year in the industry's history in which airlines will make a return on invested capital (7.9%) that is above the weighted average cost of capital (6.9%).

The drivers of the airline's industry growth remain there.

- Gross domestic product (GDP) growth in 2017 stands at 2.9%, reflecting a demand environment has been much stronger than anticipated;
- Passenger demand is expected to grow by 7.4% this year, the same growth rate as 2016 and 2.3% higher than previously forecast. Stronger demand translates into an additional 275 million passengers (over 2016), which will bring the total number of passengers expected to fly this year to 4.1 billion; and
- Cargo demand is expected to grow by 7.5% in 2017. That is more than double the 3.6% growth realised in 2016 and four percentage points above the previous forecast for this year. Total cargo carried is expected to reach 58.2 million tonnes.

But while revenues are increasing, earnings are being squeezed by rising fuel, labour and maintenance expenses.

IATA expects airlines to retain a net profit of $7.69 per passenger this year. That is down from $9.13 in 2016 and $10.08 in 2015.

Yields are eroding – especially in the traditionally strong transatlantic market.

The entrance of long-haul low-cost carriers is the novelty in this market (see page 69).

Norwegian started long-haul low-cost operations in 2016 from London Gatwick and has been expanding rapidly since. But its costs are also going up as a result of its aggressive plans (see page 68).

Other European airlines are following that trend. IAG's Level started operations in June 2017 while Air France-KLM will introduce Joon in autumn.

Joon will start with used Airbus A320-family aircraft before adding to long-haul flights with A350s. Norwegian and Level also use new aircraft: Boeing 787-9s and A330-200s.

Another major development in the industry is the rise of ultra-low-cost carriers in South America, and specifically in Argentina and Chile. Traditionally, legacy carriers in those countries have had a monopoly but Jetsmart and Flybondi will disrupt the market in 2017 (see page 64).

A good indicator for aircraft demand is the air show orders.

Airfinance Journal estimates that 1,395 orders and commitments were announced at the Paris air show in June.

Of these, 561 (or 40%) were firm orders while 60% were commitments, letters of intent or memorandum of understanding announcements.

Airlines grabbed the lion's share with about 59% of the announcements, while lessors accounted for 41%.

The diversity of airline and lessor announcements showed that the industry remains a global business.

North America led the way in firm orders with 262 aircraft, or 48% of the total firm orders. Another 12 aircraft were committed.

Europe came second for firm orders with 113 announcements, or 20.6% market share.

Overall, Asia was the focus as a total of 468 aircraft orders and commitments were announced. Asia represented 111 firm orders, or 20.3% market share. Another 357 aircraft were committed, representing 43% of the total commitments.

Africa and the Middle East represented 26 firm orders along with 95 commitments.

Airbus ended the show with 144 firm orders and MoUs for 182 aircraft, mostly for its A320-family aircraft.

In the widebody segment, Airbus recorded 12 firm orders, comprising of two A330-200s and 10 A350-900s, as well as a memorandum of understanding for eight A330neo aircraft.

Boeing's widebody tally reached 44 units, of which two firm orders were for the 777 freighter model along with two 787-8s and 31 787-9s. The Seattle-based manufacturer also reported commitments for four 787-8s and five 787-9s.

But the star of the Paris air show was the 737 Max family. The 361 orders for the Max family and commitments included 100 aircraft from lessors and 261 from airlines – more orders than all of Airbus's commercial aircraft combined. However, *Airfinance Journal* estimates that 238 announcements for the Max 10 model were conversions from previous Max orders.

As DVB's Bert van Leeuwen writes on his review (page 6), while order volumes for new aircraft reached a peak in 2013-14, today, the industry's backlog is still equivalent to more than eight years' production at 2016 levels.

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Industry review and outlook

Bert van Leeuwen, managing director, aviation research, DVB, says that although aviation is going through a 'supercycle', some airlines and manufacturers are not having such a good time.

At the risk of later being filed under "famous last words", it now starts to look like the commercial aviation industry is going through a kind of supercycle. Traffic volumes in revenue passenger kilometres (RPKs) have been growing in excess of 5% a year each year since 2010 and, halfway through 2017, it seems like this year traffic will again grow at more than 7%. In addition, airlines are continuing to enjoy ever-increasing load factors with the projected level for 2017 now at 80.7%.

While a number of airlines are struggling, on a global basis the bottom-line results of the air transport providers looks healthy, with positive net operating results every year since 2010 and for the past four years even decent returns on invested capital.

While order volumes for new aircraft reached a peak in 2013-14, today, the industry backlog is still equivalent to more than eight years' production at 2016 levels.

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. In the regional jet market, a relatively large group of manufacturers is competing for a relatively limited number of new aircraft orders.

Lessors and investors seem to have little to complain about. There is plenty of new equity available for investment, trading volume is high and airlines are generally willing to extend leases, even for slightly older technology aircraft. For investors eager to expand their portfolios, the consequence of the above is that purchase prices of aircraft on lease are very high and investment can only be justified under optimistic residual value assumptions. For some of the investors, the cloud on the horizon may be the downward trend in used twin-aisle values.

So, are there no concerns? Certainly not. There is still a number of airlines in deep trouble. Alitalia and Air Berlin are prominent examples and while not in the danger zone in any form, even the mighty Middle East carriers are not shining as brightly as they once were. While the manufacturers cannot produce enough A320s and 737s it seems, the A380 and 747 are struggling and the current-generation A330 and 777 aircraft do not fly off the shelves. Investors with significant positions in large twin aisles, such as the A380 or even 777s, probably look at future lease terminations with some concern.

The title of the most recent (July 2017) update of the International Monetary Fund's (IMF) World Economic Outlook nicely summarises the current macro-economic situation: "A Firming Recovery".

The IMF confirms that the pickup of the global economic growth remains on track and projects a growth in global output of 3.5% for 2017, increasing to 3.6% in 2018. Projected oil price increases have been adjusted downwards for 2017. The average oil price was $42.8 per barrel in 2016 and the IMF now projects an average of $51.9/bbl (adjusted from $55.2) for 2017 and $52/bbl (adjusted from $55.06) for 2018. Growth in global trade and industrial production as well as receding oil prices are obviously good news for commercial aviation, so from that perspective the industry's supercycle should not be at risk.

While on aggregate level growth projections remain stable, the IMF's outlook for individual economic regions has changed over the past year. Interesting enough, despite Brexit, the IMF states that, in Europe, the political risk has diminished and concludes that the cyclical rebound in Europe – except the UK – could be stronger and more sustained.

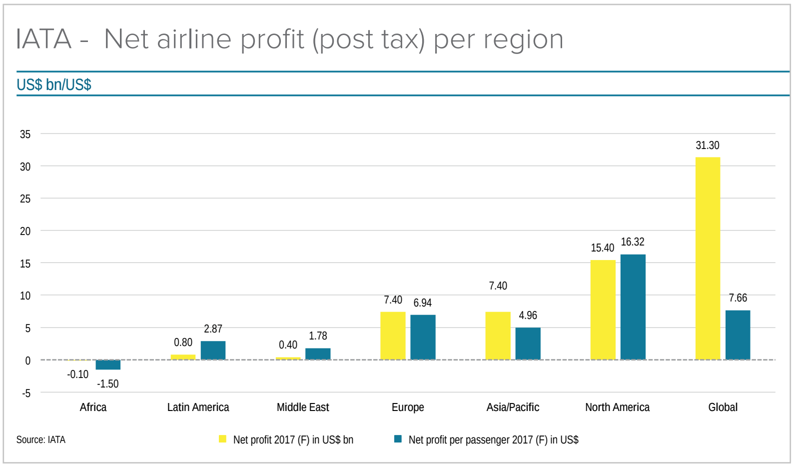
The growth forecast for the US has been revised down to 2.1% from 2.3% in 2017 and to 2.1% from 2.5% for 2018. The revision reflects the weaker growth during the first quarter of 2017 but more so the less-than-assumed expansionary fiscal policy changes. Market expectations of fiscal stimulus have also receded.

Growth in China is expected to remain at the same level in 2017 as it was in 2016, 6.7% with a slightly lower 6.4% projected for 2018. China is now expected to maintain high public investment, which comes at the cost of further large increases in debt (with additional downside risk).

Emerging and developing countries are also expected to see a sustained pickup in activity, with growth rising to 4.6% in 2017 and 4.8% in 2018. The IMF expects gradually improving conditions for commodity exporting countries, which suffered during the recession of 2015-16.

On the risk side, the IMF signals a more protracted period of policy uncertainty, citing difficult-to-predict US regulatory and fiscal policies. For China, financial sector risks and excessive credit growth could result in an abrupt slowdown. For some European countries, concerns remain about weak bank balance sheets and financial stability. On a global basis, the risk of more inward-looking policies could fuel protectionism, while, as always, geopolitical tensions can result in a slowdown of growth.

The global aviation industry has proven remarkably too resilient to many geopolitical and other noneconomic shocks. According to UNWTO – World Tourism Barometer, global travel and tourism remains relatively strong. Over the full year 2016, international tourist arrivals



increased 3.9%, but also there were big differences among the various regions. Sub-Saharan Africa and Asia-Pacific grew by 10.7% and 8.6%, respectively. The Americas saw 3.9% more tourist arrivals, while for Europe growth was limited to 2.1%.

Within Europe the performance varied by country, with Belgium, France and Montenegro in the red and Cyprus, Finland, Iceland, Malta and Portugal among the winners. The Middle East showed the worst performance as a region with a 4.1% decline, and Turkey and Egypt deep in the red.

For 2017, not too many statistics have been published, but UNWTO indicates that international tourist arrivals over the period of January-April increased by 6%. Even some areas that were under pressure during 2016 seem to be recovering. The Middle East numbers increased by 10%, Africa by 8%, Europe as well as Asia-Pacific by 6% and the Americas by 4%. UNWTO concludes: "Destinations affected by negative events during 2016 are showing clear signs of recovery in a very short period of time ..."

Over the first half of 2017, global revenue passenger kilometres increased by no less than 7.9%. According to the International Air Transport Association (IATA), the global airline trade association, the brighter economic circumstances in combination with generally lower airfares were the main causes for this acceleration versus the 7.4% growth achieved in 2016.

The average return fare (before surcharges and taxes) in constant (2016) US dollars dropped from $417 in 2015, to $366 in 2016, and is anticipated to drop further to $353 in 2017. While average fares have been falling for decades, it has been the lower fuel price that enabled airlines to lower ticket prices. Fuel cost for the global airlines dropped dramatically, especially between 2015 and 2014, by 22.1%. Another significant drop of 24.1% could be noted between 2015 and 2016. For 2017, the fuel bill will decrease only by a modest 2.6%. The average annual fuel price in $/bbl dropped by 41.9% in 2015, 21.9% in 2016 but will increase again in 2017 by an anticipated 22.8%. Between 2015 and 2017, fuel cost as a percentage of total operating cost decreased to 18.8% from 26.5%.

The projected total spend on air transport in 2017 is anticipated to be about $775 billion, 5.3% higher compared with the $737 billion from 2016. In real volume terms, both the RPKs, as well as the number of passenger departures, are projected to increase. The RPKs volume will rise from 7.164 billion in 2016 to an estimated 7.694 this year, a 6.4% increase. The number of passenger departures will increase by about 7.2% to 4.085 million.

The airline industry is offering its customers an increasing range of direct connections. Over the past 20 years, connectivity has doubled and today the world's airlines offer connections between almost 20,000 unique city-pairs.

From a financial perspective, the airlines seem to have entered a whole new era after 2014. Before that year, 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 8.5% and preliminary figures for 2016 indicate an even higher level of 8.8%. For 2017, the expectations are a little more modest, with a forecast for 7.5%. It should be noted that the main source of profitability in 2015, 2016 and in 2017 was and is the North American market. It is interesting to compare the absolute post-tax profit per region, as well as the profit per passenger. By both criteria, North America stands out.

Comparing net profit figures, the system-wide global commercial airline profit reached $34.8 billion in 2016. Just over 47% of this, or $16.5 billion, was generated by North American airlines. Some 25% came from their European colleagues, with another 23% from the Asia-Pacific operators and 3% from the Middle East-based players. For 2017, this is not likely to change a lot. North America is projected to account for 49% of the anticipated $31.4 billion net profit, Europe and Asia-Pacific 24% each and Latin America for just under 3%. Profitability of the Middle East carriers is expected to come under pressure, resulting in a contribution of just 1% to global net profit.

Comparing the profitability per passenger eliminates the impact of the relative size of each region. Asia-Pacific as an example has a share of 32.8% of global traffic, versus only 2.2% for Africa. Profitability per passenger as such reflects the performance of each region more fairly. For 2017, each North American airline's passenger is projected to generate $16.32 net profit. In Europe, this is $6.94, in Asia-Pacific $4.96, in Latin America $2.87 and in the Middle East a meagre $1.78. African carriers subsidise each passenger as they generate a negative $1.5 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

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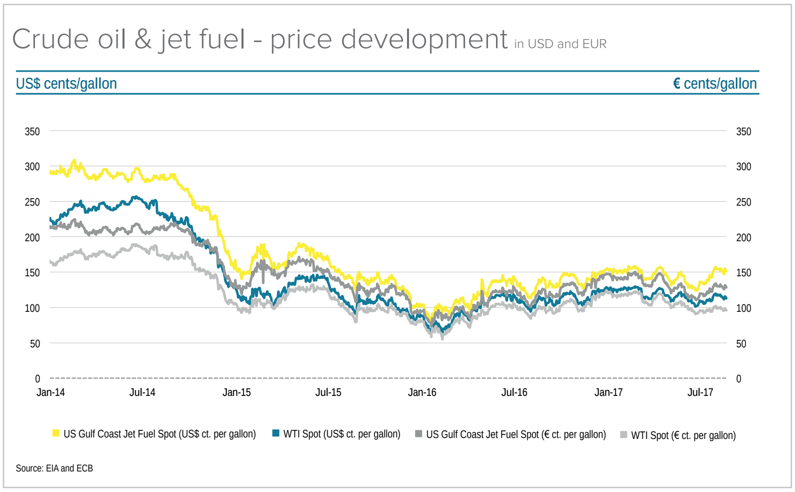


after a wave of consolidation. This has enabled improved pricing power, as well as higher load factors and more income from ancillary services.

Traditionally, when airline profitability goes up, also the new order volume for commercial aircraft increases. In recent years, this relation has been broken. While the industry profit doubled between 2014 and 2015 and stayed at near a record high level in 2016, the number of new aircraft orders dropped from about 3,500 in 2014 to about 2,350 in 2015 to about 2,100 in 2016 (new orders for western-built jets, all commercial operations including type-swaps).

Over the first eight months of 2017, the trend in new ordering has continued with about 800 orders versus just over 1,000 over the same period in 2016. Both the Boeing 737 and the Airbus A320 continue to be the most popular types by far. Airbus sold about 180 new engine options (Neo) and 90 current engine option (Ceo) aircraft but there was a significant number of type swaps included in this number. Boeing sold about 250 Max aircraft and about 60 next generation (NG) aircraft but booked additional commitments for the new Max 10 during the Paris air show, that later during the year may be converted to official orders.

Embraer has seen a limited order volume during 2017, fairly evenly split between the current E-Jets and the new E2. After a successful 2016, order volumes for the Bombardier CSeries collapsed again and Mitsubishi's MRJ has not had much sales success either. Widebody aircraft sales were particularly hit in 2017, with only about 160 orders over the first eight months, of which half were Boeing 787s.

Despite some fuel price increases during the recent months, fuel remains relatively cheap and airlines seem to be comfortable with extending leases on existing old- and current-technology aircraft, rather than 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 lease rate) aircraft without paying a huge penalty in the form of a massively higher fuel bill.

As airlines generally 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 aircraft.

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 per gallon. Subsequently, the price showed a generally upward tend to fluctuate between about $1.5 and $1.55 in August 2017.

Apart from the 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 in reality may not take as long though.

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 the years 2015-16. The importance for aircraft orders of the launch of a new aircraft type was vividly illustrated during the Paris air show in June this year, when Boeing launched a new stretched version of the Boeing 737 family, dubbed the Max 10.

Shortly after the launch of this new version, Boeing could book over 360 commitments, 260 orders plus more than 100 letters of intent (LoI) and options. It must be noted that the majority of these orders were changes in variant. As an example, United Airlines swapped an order for 100 Max 9 aircraft originally placed in 2012 to a similar number of Max 10 aircraft.

For the near future, it seems unlikely that we will see major new product launches, albeit Airbus and Boeing are rumoured to be contemplating new aircraft versions, such as an A350-2000, a 777-10X, an all-new middle-of-the-market aircraft, the 797 and a stretched and re-winged A322. Effectively, none of these have been confirmed. Most developments that were announced focused on range increases and high-density interiors, by applying slimline seats, more compact galleys and lavatories and reconfigured emergency exits. Examples of this trend include the 737 Max 8-200 and the A321-200NX.

One thing is clear: any airline or leasing company looking to finance its fleet purchases today has ample choice from a range of funding sources. Both debt funding, as well as equity, is abundantly available at historically low cost and offered by a broad range of lenders and investors from around the world. The only traditional sources of funding that have not been available for almost two years has been export finance for Airbus and Boeing products.

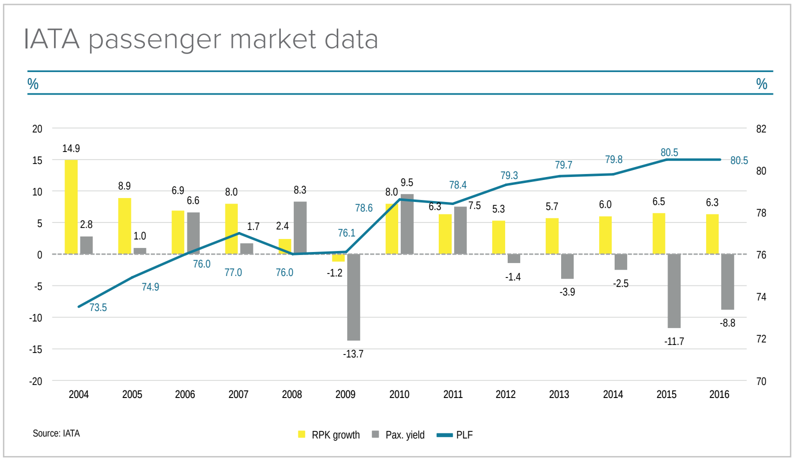
Both the Export-Import Bank of the US (Ex-Im) and the European export credit agencies (ECAs) had their problems. While Ex-Im's charter was reauthorised for five years at the end of 2015, the US Senate did not nominate three new board members for Ex-Im, essentially taking away the bank's ability to approve big ticket $10 million-plus transactions. US President Trump in August 2017 nominated former Congressman Scott Garrett to lead the bank, but some fear that – as one of Ex-Im's fiercest critics – the appointment of Garrett is an intentional act of sabotage. The issue could come to a head this autumn if Senate Republicans move forward with a hearing and confirmation votes for Garrett. Some of the leading groups opposed to Ex-Im are warning the Senate Banking Committee about the consequences of failing to advance the nomination. Reportedly, at least three Senate Republicans – the number it would take to block his confirmation if Democrats uniformly were to oppose him – have indicated they are on the fence.

In Europe, the problems are of an entirely different nature. In April 2016, the export credit agency of the United Kingdom (UKEF), France (Coface) and Germany (Euler Hermes) halted all guarantees and export support for Airbus aircraft. Reportedly 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 June 2017, the chief executive of Airbus, Tom Enders, was reported to be expecting prolonged investigations by government antifraud authorities before various probes are completed. Enders expected these investigations "...to last for some time, probably years..." He said Airbus was facing "serious compliance issues" but, in the meantime, the company reportedly has stepped up efforts to enhance compliance procedures.

Probably the timing of these two incidents could not have been better. Boeing reported that the percentage of deliveries supported by Ex-Im reached 30% during the global financial crisis between 2009 and 2012. In the period 2012 to 2016, this percentage had steadily come down to a low of 7% last year. This is probably partly a result of the 2011 Aircraft Sector Understanding that increased the cost of export financing for most borrowers and made commercial funding more attractive. Given the political situation in the US, it is unlikely that Boeing's 2017 forecast – assuming that US and European ECAs will come back online – of a 10% share for the export credit agencies will be achievable. As an alternative to export credit, Boeing, together with Marsh & McLennan and Aircraft Finance Consortium (AFIC), developed the Aircraft Finance Insurance Product. AFIC is a syndicate of insurance companies providing a default or non-payment insurance for banks and capital market investors that are funding new aircraft purchases from Boeing. The premiums as well as the advance rates are inspired by the terms set forth in the 2011 Aircraft Sector Understanding. The structure has already been used to refinance a new 747-8.

While AFIC reportedly has no immediate plans to support Airbus aircraft, there seems to be no specific reason why the European manufacturer could pursue a similar solution.

As another export credit innovation, LOT Polish Airlines has taken two 787s on finance leases with guarantees from UK Export Finance. These aircraft are the first 787s to be guaranteed by UKEF under a programme in which the agency offers support for (Rolls-Royce-powered) aircraft with a significant UK content.



Air transport market – first half of 2017

The good times for the global air transport market continued during the first half of 2017, maintaining a very similar growth rate to 2016 despite political uncertainties in some of the biggest markets. According to IATA, total RPKs increased by 7.4% year on year for the full-year 2016, practically matching the 7.5% increase in capacity (available seat kilometres, or ASKs) and, in the first months of 2017, passenger growth has accelerated to 7.9% year on year, the fastest growth in the first half of a year since 2005. This is even more positive when taking into account ASKs growth was 6.1%, meaning demand growth has outstripped capacity growth, leading to record load factor levels at 80.7% for the first half of 2017.

International traffic – representing 63.7% of total traffic – grew by a remarkable 8.1% (2016: 6.2%), while domestic traffic – representing 36.3% of total traffic – grew 7.4% (2016: 5.6%). The 2017 numbers are above the 10-year average rates (5.5%), and are sustained by a positive global economic development and also by lower fares. Having said that, there is a slowing trend in RPKs growth, driven mainly by two factors: business confidence is now keeping stable after several months growing, and average fares seem to have bottomed out and, in fact, some data show that yields have started a modest growth, reversing the downwards dominating trend since 2013-14.

Unlike in previous years when the Middle East carriers were leading traffic growth, most of this growth in 2017 comes from airlines in Asia-Pacific and Europe (representing 32.8% and 26.5%, respectively, of world RPKs in 2016), with a 10.6% and 8.8% each of RPKs increase. This is against an ASKs growth of only 7.9% in Asia-Pacific and 6.3% in Europe, which, therefore, resulted in slightly higher load factors in both areas (plus two percentage points in Asia-Pacific and plus 1.9 percentage points in Europe).

The other side of the coin is the Middle East, which at a 7.5% increase in ASKs has grown at a slower pace than… therefore dropping load factors to 73.4% (-0.4 percentage points compared with the previous year). Despite the political turmoil in the region and the shift in strategy at Etihad, the big three still took delivery of 19 passenger widebodies in the first half of 2017 (including six 777s, six A380s, four 787s and two A350s).

In the first half of 2017, the region showing the highest growth rates in international traffic is Latin America, with 9.4% (compared with 7.7% in the first half of 2016). With a share of 5.2% of world RPKs, it is still behind the Middle East (9.6%), but it is showing an overall growth of 6.6% on RPKs versus a 4.2% growth on ASKs, delivering the third-highest load factor at 81.4%.

Interestingly, international RPKs within South America has grown by almost 13%, which shows a slight improvement in some of the economies in the region (Argentina and Brazil) and despite the very negative development of Venezuela. It is also worth noting the incoming low-cost carrier (LCC) presence in one of the last countries to adapt the model, Argentina, which will possibly stimulate further traffic growth by adding capacity and also lower fares.

As in 2016, Africa had very high rates in terms of international traffic growth, with 8.2% growth in RPKs, but admittedly from a low base because Africa represented only a 2.2% share in world RPKs in 2016 and there are strong differences within the region – with Nigeria seeing improvements in business confidence on the positive side, and South Africa's economy entering into recession in early 2017. If we take into account both international and domestic routes, in first half of 2017, African carriers saw their traffic increase by 8.1%, outperforming a 4.2% increase in ASKs capacity. Nevertheless, African carriers still show the lowest figures of all regions in terms of load factor, with a mere 68.6% (although an increase of 2.5 percentage points compared with earlier in the year). The third highest international RPKs growth percentage was recorded by airlines in the large Asia-Pacific region, which is responsible for 32.8% of world traffic. Asia-Pacific carriers' international traffic grew by 9.1% and overall by 10.6%, as mentioned earlier. ASKs production increased modestly with 7.9%.

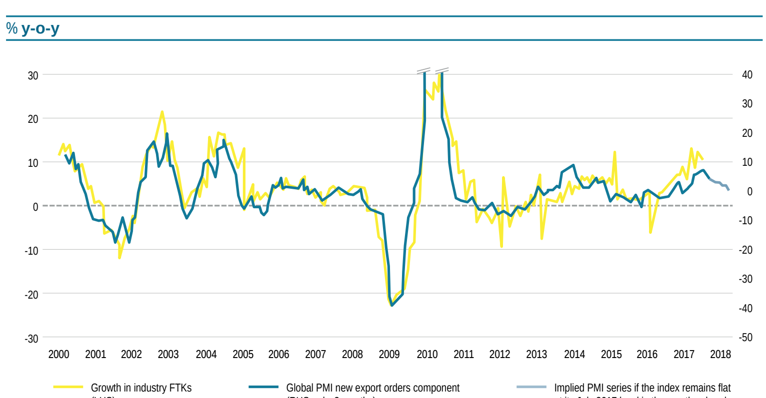
European international traffic increased by 8.8% (RPKs) and ASKs production by 6%. European carriers achieved the second-highest load factor, 82.4%. This is despite of the negative impact of terrorist events in Europe, which, according to Iata, represented a loss of traffic equivalent to 1.6% of international traffic or about $2.5 billion in revenues in 2016. Nevertheless, traffic levels rebounded, showing once more how air passenger demand is resilient to shock events such as terrorism, the Sars pandemic, or the Icelandic volcanic ash cloud.

North American carriers – representing 23.7% of world traffic – continue maintaining a profitability focus, and the region has been once again the most profitable, while being the one with the lowest growth rates in both RPKs (plus 3.8%) and ASKs (plus 3.4%), delivering once again record load factor levels at 83.1% in the first half of 2017.

While much smaller overall, compared with the international traffic flows, domestic markets often reveal interesting developments and, during the first half of 2017, showed certainly more extremes. Except the domestic US market (15% of world traffic) and China (8.7%), the other domestic markets for which Iata releases monthly figures (Australia, Brazil, India, Japan and Russia) represent between 1% and 2% of world traffic each. India surged to the top of the domestic markets in 2015 and 2016, and while growth slowed a bit compared with previous year, this growth continued in 2017 with a very significant RPKs volume growth of 18.6%, ahead of a 15.5% production increase. The load factor in the Indian domestic market beat the previous year's record of 84.4%, reaching an impressive 85.9% in the first half of 2017, which (at least for now) continues to support the huge fleet purchases of Indian carriers in recent years.

The recent developments in government economic policy in China did not hinder the domestic air transport market, where demand grew also above production, 15.2% and 12.5%, respectively, delivering very high load factors at 84.4%. Russia also saw a significant surge in domestic demand, with a 13.4% RPKs growth, based on a 13.8% increase in ASKs. Despite this growth, Russia had the second-lowest load factors of all domestic markets measured, reaching 77.2%. Whether this is the underlying

Air freight growth vs. global new export orders



impact of Abenomics or the increased presence of LCCs, Japan's domestic market grew way above its production, reaching a 6.5% RPKs increase on only 1.6% ASKs growth, although with a meagre 68.9% load factor, the lowest of all measured domestic markets.

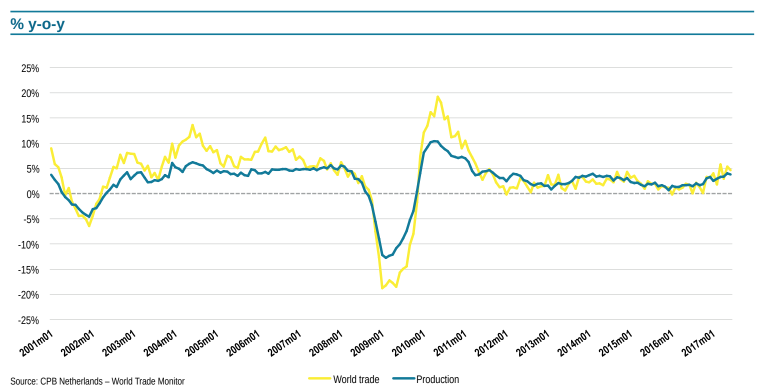
The big US domestic market showed a reasonable traffic increase of 3.4%, very much in line with the 3.3% ASKs expansion. As it has been the case over the past few years, load factors in the domestic US market have maintained its mark, reaching the 84.5% this year. The relatively small Australian domestic market went almost down under with a 0.3% RPKs growth on a 2.3% decrease in production In Brazil, the political crisis seems to affect the slight economic recovery, but RPKs grew by 1% on a slight decrease in ASKs of -0.1%, meaning load factors improved to 80.2%.

Moving on from the passenger market to the air freight market (air cargo officially includes airfreight and expresss/mail, but we use the terms interchangeably), it is important to realise the global fleet of maindeck commercial jet freighters (including combis and convertibles) is about one-eighth of the size of the passenger fleet. Over the past couple of years, the airfreight market has experienced some rough turbulences and it did not experience the good times of the passenger market. Nevertheless, in the second half of 2016, global air cargo volumes, expressed in freight tonne-kilometres (FTKs) started to show some improvement. This trend has accelerated in the first half of 2017, when FTKs grew by 10.4% in annual terms, on a production increase of only 3.6%. In 2017, the airfreight operators benefited from a stronger global economic situation, which generated higher trade demand despite some political issues pointing at an increase in protectionism.

Continuing with the positive tone, freight demand improved in all regions (unlike in previous years), and it was mainly driven by Asia-Pacific and Europe, with solid development also in North America and the Middle East. Overall, load factors have improved by about four percentage points compared with 2016, being close to the highest level in the past two-and-a-half years.

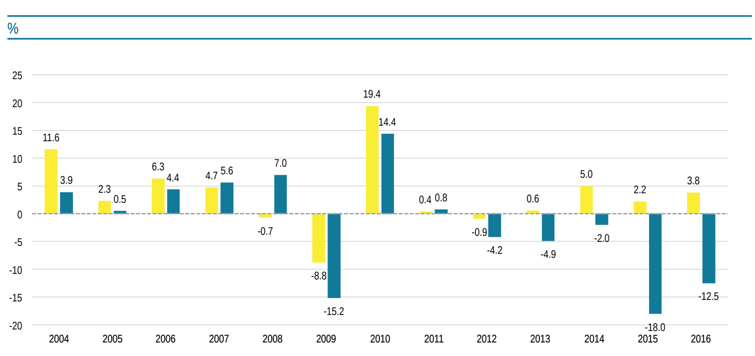
Airfreight has outperformed wider world trade ratios, which is probably a result of both a decline in inventory-to-sales ratio and also a higher market confidence. In fact, the new export orders component of the global purchasing managers' index (PMI) is at an almost six-year high and

Global production and global trade (YoY chnages in %)



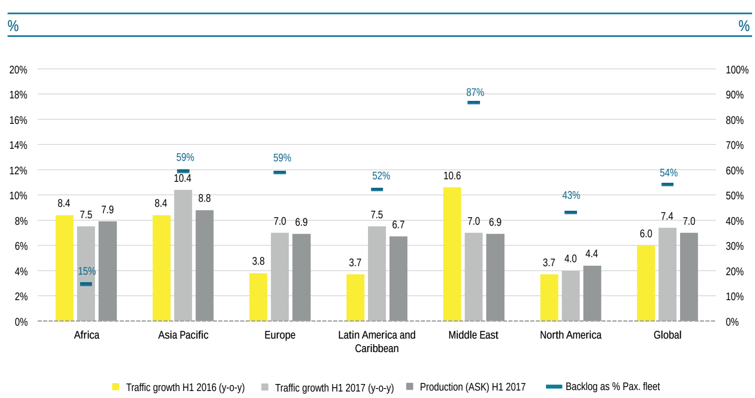
Source: CPB Netherlands – World Trade Monitor

IATA cargo market data



Source: IATA

Traffic growth and capacity on order



Sources: IATA, Ascend

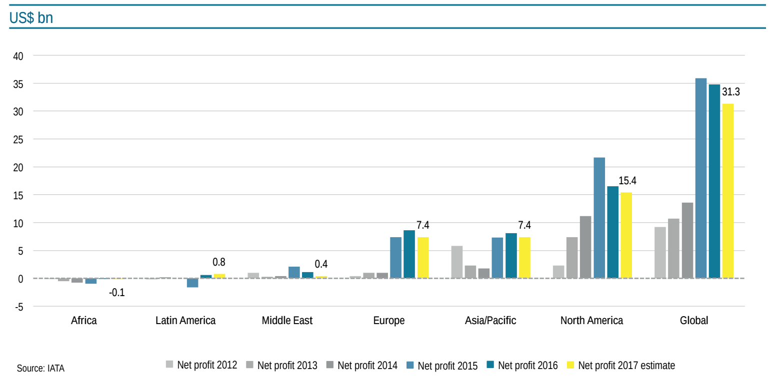
although in the past few months has remained stable, it suggests that FTKs growth in the third quarter 2017 will continue to be robust and growth will ease a bit towards the end of the year, and IATA forecasts that overall FTKs will grow at 7.5% or more for the whole of 2017.

The turnaround of air cargo is remarkable. About a year ago, it looked like the world had just entered a phase of deglobalisation. Air cargo operators were not the only ones suffering. Maritime container carriers are confronted with the same problem. Danish shipping conglomerate AP Møller Mærsk at the time voiced concerns over how a potential shift in global policy in favour of more protectionism threatened to reduce global trade. Tariff barriers, Brexit and the potential political shift in the US were examples of this. Early 2016, growth of global production for a while exceeded growth of global trade – in other words, deglobalisation was happening. In the meantime, fortunately, things returned to normal and in recent months global trade has outpaced production again, as is clearly shown in the chart based on World Trade Monitor data provided by the Dutch Central Bureau of Statistics.

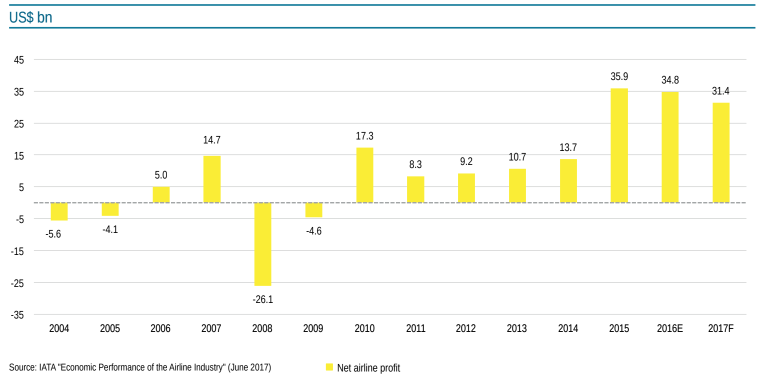
During the first half of 2017, 10 new widebody freighters were delivered (five 767-300ERFs to FedEx, two 747-8Fs, two A330-200Fs and one 777-200 LRF), plus 21 passenger-to-freighter cargo conversions (11 767-300ERs mainly for Amazon's Prime Air, nine 757-200s and one 747-400). During the same period only 16 widebody freighters were retired (mainly 757-200SFs but also four 747s, two MD11Fs and one A300). The 20 converted narrowbody jet freighters are mainly 737-400s and 737-300s, but also one 737-700, and three MD80s.

In volume terms, Europe and Asia-Pacific carriers lead the way in the air cargo market with double-digit growth, 13.6% and 10.1% FTKs, respectively, on a capacity growth of 5.4% and 4.8%, thus improving load factors by 3.4 and 2.5 percentage points. North American carriers came close with 9.3% growth in demand, achieved with a tiny 1.5% increase in production. The Middle East grew at a slightly lower pace but still relevant 7.6% on a small

Airline net profit (post tax, in US$bn) by IATA region



Worldwide airline profitability



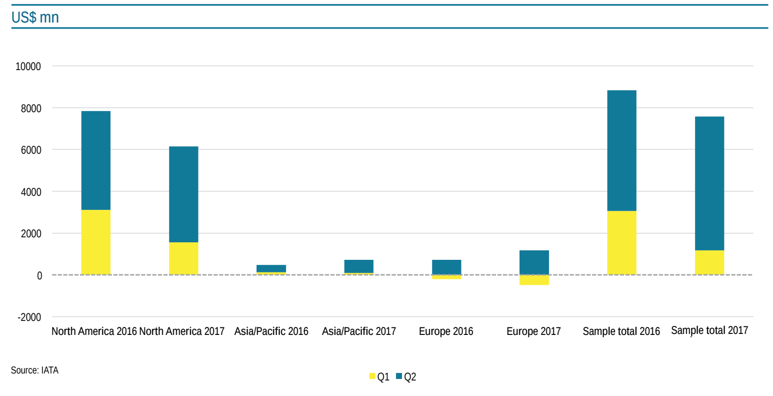
capacity growth of 1.5%.

Africa and Latin America, by far the smallest markets in terms of share (both below 3% of world share), experienced quite different evolutions. Africa grew an impressive 25.9% FTKs on an 11.2% capacity growth. Nevertheless, it is still the region with the lowest load factors by far, having achieved a 25.1% load factor after this significant growth. On the other hand, Latin America remained more or less stable in terms of FTKs with 0.3% growth, although capacity decreased by -0.6% compared with last year. At the global level, load factor improved by 2.7 percentage points to 44.8%.

Returning to the passenger market and looking at the relationship between traffic growth and capacity expansion, the orderbook stands at 54% of current fleet. Nevertheless, there is some concentration in the Middle East airlines (as of September 2017, the Middle East orderbook for passenger jets stands at 87% of its current fleet size), and especially on widebodies, despite the decreasing demand trends and the political tensions arising in the region.

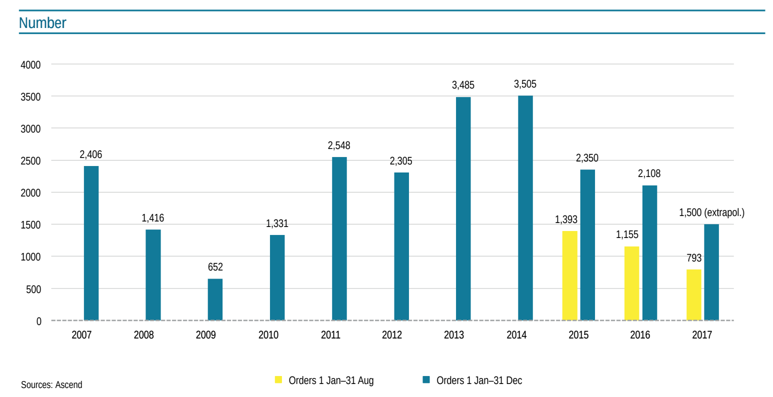
Airlines can attract more passengers by offering more capacity in the form of more (direct) connections, as well as increasing frequency of service. The number of unique city-pair connections is expected to reach more than 19,000 this year, almost double the connectivity by air 20 years ago, enabling the big increase in passenger numbers that we have consistently seen in these years. Likewise, another way of stimulating traffic is by lowering ticket prices. Since 2013, this has happened on a global scale and, in 2016, fuel price reached levels not seen in more than 10 years, resulting in a lower fuel bill that allowed airlines to lower the

IATA estimates - net post tax profit H1 2016 and H1 2017



Source: IATA

Order volume commercial jets



Sources: Ascend

prices significantly, resulting in an 8.8% lower passenger yield. However, with fuel prices showing upward tendencies around mid-2017, together with rising labour costs, might mean that traffic stimulation by lower ticket prices may not be a viable option for much longer. As it is to be expected, airlines are not able to translate fuel cost increases in higher average fares immediately, so airline profitability in 2017, while still positive, is slightly below that in 2016.

On the air cargo markets, demand is performing solidly, with growth since the second half of 2016. This uptick in demand is also helping increase yields in the first part of 2017, which therefore help to improve profit margins for cargo operators.

Even if we are only halfway through the year, it is reasonable to assume that the final financial results for the global airlines in 2017 will be below those of 2016 as it has been shown in both the first and second quarters. Yields have started to show a modest upward trend, but unit costs are growing more because of both internal (labour) and external factors (fuel price). Nevertheless, 2017 results will still be positive and above cost of capital (WACC), with Iata forecasting $31.4 billion net profit for the year. Over 2016, commercial airlines booked (again) a record profit, with an operating margin of 8.8% and a net profit of $34.8 billion (compared with $35.3 billion and 8.5% operating profit in 2015). As in 2015, the net result by far exceeded anything that the industry had seen before. This means that 2016 delivered a 9.9% return on invested capital, delivering for the second time in aviation history a percentage that exceeds the weighted cost of capital (this happened also in 2015). Clearly, the unexpected fall in fuel cost was the main reason for this profit boom but, in addition, a robust growth in demand for air transport, a more bottom-line focused airline policy in general and certainly the consolidation of the North American airlines were other contributing factors.

Speaking of consolidation, it seems that 2017 might be the year when consolidation in Europe might help the airlines in the region boost their profit margins closer to those of their North American counterparts. With both Alitalia and Air Berlin in the process of being acquired, together with the shareholder tie-up among some other carriers (Virgin Atlantic with Delta, Air France-KLM and China Southern), but also a continuing trend of consolidation among smaller, regional carriers, it is safe to expect a quite different outlook in the mid-term where less-efficient airlines either disappear or are acquired and start generating better returns to their investors.

Orders placed all civil operators (1 Jan–1 Sep 2017)

Western single aisles	New	Swaps
737 MAX-10	53	214*
737 MAX 8	42	
737MAX-8-200	10	
737 MAX-9	8	
737 MAX 7	5	
737 MAX BBJ	2	
738 MAX TBD	135	
737-800	47	
737-900ER	10	
737 BBJ	2	
A319CEO	7	
A320CEO	31	5
A321CEO	47	1
A320NEO	111	15
A321NEO	14	39
	524	60

Western twin aisles	New
747-8F	2
747-8I	1
777-200LRF	1
777-300ER	16
777 8X/9X	20
787-8	7
787-9	56
787-10	19
A330-200	6
A350-900XWB	33
A350-1000XWB	1
	162

Western regional jets	New
E175-E1	13
E190-E1	5
E190-E2	3
E195-E1	1
E195-E2	12
ERJ135 Legacy	3
CRJ900NG	10
	47

Western turboprops	New
ATR72-600	34
Dash 8 - Q400	14
Lockheed LM-100J	5
DHC-6 Twin Otter	3
CASA C-295	12
	68

Eastern aircraft	New
Superjet 100	10
L-410 Turbolet	3
	13

Grand total all	874

* Boeing "variant changes" not reported for all new transactions
Source: Flightglobal

Commercial jets – backlog as per 1 Sep 2017

(western built, all civil operators)

Family	Versions/variants						Total
	E170	**E175**	**E190**	**E195**			
E-Jets E1	1	52	58	8			119
E-Jets E2		100	86	102			288
	MAX7	**MAX8**	**MAX8-200**	**MAX9**	**MAX10**	**MAX?**	
B737MAX	66	2071	210	122	267	1093	3,829
	B737-700	**B737-800**	**B737-900ER**				
B737NG	4	520	73				597
	B747-8F	**B747-8I**					
B747-8I/F	17	1					18
B767-300ERF	68						68
	B777-200LRF	**B777-300ER**					
B777 CURRENT	31	68					99
	B777-8X	**B777-9X**	**B777--?X**				
B777X	53	243	30				326
	B787-8	**B787-9**	**B787-10**				
B787	83	438	168				689
	A319	**A320**	**A321**				
A320CEO	27	231	233				491
A320NEO PW		809	598				1,407

Family	Versions/variants						Total
	A319	**A320**	**A321**				
A320NEO CFM	31	1281	560				1,872
A320NEO ?	18	1462	260				1,740
A320NEO (ALL)	*49*	*3552*	*1418*				*5,019*
	A330-200	**A330-200F**	**A330-300**				
A330CEO	25	4	72				101
	A330-800	**A330-900**					
A330NEO	6	204					210
	A350-800	**A350-900**	**A350-1000**				
A350	8	521	212				741
A380	102						102
	CRJ700	**CRJ900**	**CRJ1000**				
CRJ	10	24	14				48
	CS100	**CS300**					
Cseries	110	232					342
ERJ-135	17						17
MRJ90	233						233
Grand total all							13,337

Sources: Ascend

Nonetheless, in 2017 we have seen also other rumbling factors – ie, a growing number of unions requesting better conditions (some of which were waived by employees in the restructuring years some time ago, so now the airlines are delivering consistent profits they are claiming those back) and disrupting the airlines' revenue generation by a series of strikes, particularly at flight crew level.

In North America, airlines have had to agree to significant pay rises, partly responding to pilot union aims to restore salaries to pre-Chapter 11 levels. In Europe, several of the larger airlines have been or still are in the process of negotiating agreements. This may cause a significant increase in the airlines' cost but with the market consolidation we have seen and its effects on the revenue side, it is still early to assume these cost increases will translate into negative results.

As in the previous year, the global results over 2016 could mainly be contributed to the North American airlines. IATA estimates that $16.5 billion or 47% of the net airline profit was generated by airlines from this continent. Europe generated about 24% of the global result and Asia-Pacific a similar level at 23% with $8.6 billion and $8.1 billion, respectively. The (still) expanding Middle East carriers generated $1.1 billion, while Latin American carriers scored an improved $600 million net profit and Africa one more time ended in the red with a consolidated loss of $100 million. On a per passenger basis, the result of North America is even more spectacular. With a realised net profit of $16.32, this continent is more than two times as profitable as the joint runner-up, Europe, with $6.94 per passenger.

Based on a sample of 24 airlines, Iata has published some very early results for 2017. While first-quarter overall profitability was down from 9.6% to 4.8%, the second-quarter trend was inverted and second quarter 2017 delivered a 13.2% net margin versus 12.7% for the same period in 2016, Overall, Iata forecasts 2017 net margin to be at 4.2% (compared with 4.9% in 2016). Of course, the sample is too small to draw any conclusions, but it looks like airline profitability this year will be lower than both 2015 and 2016.

Equipment market

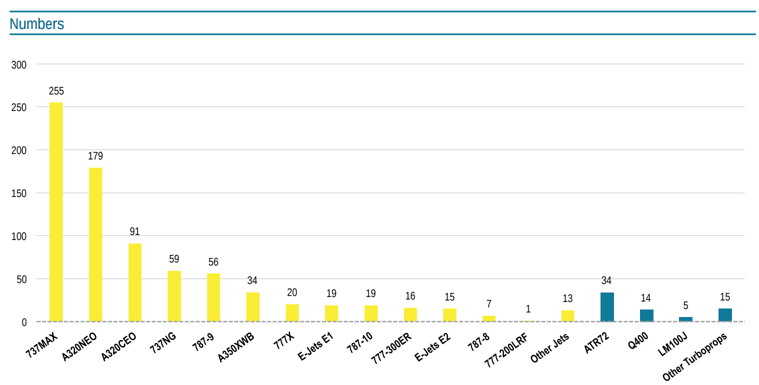
After several years of increasing sales volumes, a commercial jet order slow down started in 2015. This downward trend continued into 2016, as well as over the first half of 2017. According to the latest *Flightglobal* figures, western-built jet sales (all civil operations, including type swaps) collapsed by about 17% between 2015 and 2016. At the time of writing, early September 2017 sales had dropped another 32% compared with the first eight months of 2016.

A simple mechanical extrapolation of the sales total (as reflected in our database) of 793 as of 1 September to a full-year level would roughly result in less than a 1,500 sales total over the full-year 2017. Obviously, a few mega-orders can change this number dramatically and, in some cases, reported orders – such as the many swaps of 737 Max 9s to Max 10s (United Airlines, Spicejet, Copa Airlines, TUI, etc) – are registered as "variant changes" and are not included as new orders in the graph. In addition, an letter of intent (LoI) by Lion Air for 50 Max 10s was not officially registered as a confirmed order yet.

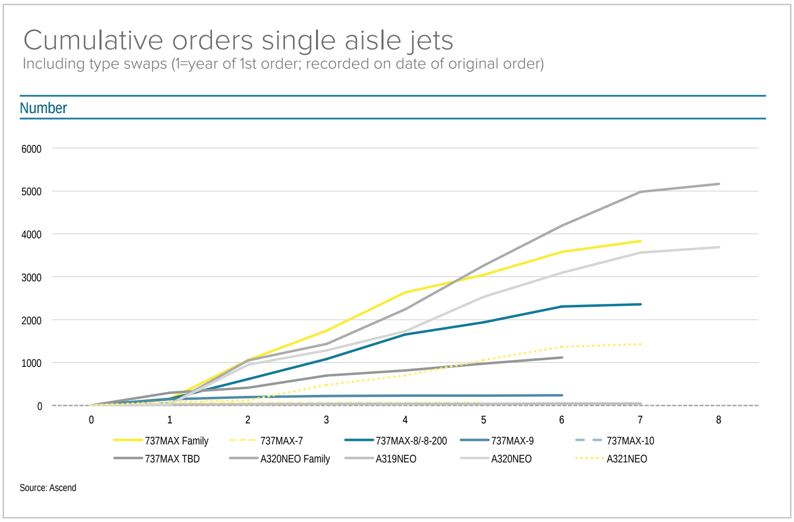
According to *Flightglobal* data as of early September, over the first eight months of 2017, a total of 874 commercial aircraft were sold, of which 13 were for eastern aircraft (including 10 Sukhoi Superjet 100s) and 68 were for western turboprops. The remaining 793 aircraft are western-built jets. This number included 60 so-called type swaps,

Commercial aircraft orders 2017 y-t-d

(All civil operators, as of 1 Sep, including A320 family swaps, excluding 737 variant changes)



Sources: Ascend



changes in the versions that were ordered within the A320 family. Also, within the 737 family, version changes took place, especially in favour of the newly launched Max 10, but here not all changes are reported. Out of the remaining 793 new orders, western regional jets took 47, single aisles 584 and twin aisles 162. Per aircraft type, the split-up is reflected in the table.

While the already full orderbook, as well as the low fuel price, can be used to explain the softening of the new equipment market, the fact that no really new aircraft types were announced during 2016 and 2017 to date, does not help to stimulate the market either. Generally, new aircraft introductions significantly stimulate sales volumes. In a way, this is illustrated by the impact of the launch of the new 737 Max 10 at the 2017 Paris air show. The Max 10 achieved a respectable volume of 267 orders plus 112 LoI/options shortly after launch. In this case, the majority of orders so far were mainly the result of airlines swapping their existing Max 9s into Max 10 orders, but the market – both airlines and lessors – were clearly interested in the new version. Airbus did not launch a new version of the A320 family but announced the new nomenclature to identify the Neo version of the A320 family. The A320neo will be called A320N, the A321neo will become the A321-200N and the A321-200NX will be the new designation for an A321neo with the Airbus Cabin Flex (ACF) door configuration. Under ACF, doors one and four will get wider escape slides, door two will be deleted and door three will be moved aft by four frames and as an option can be plugged. Over-wing exit one will be deactivated but as an option can be activated, and the reverse is applicable to over-wing exit two. All these options are intended to optimise the door configuration for different cabin layouts. As extremes in a generic 164-seat interior, doors one and four plus over-wing exit one are activated. In a high-density 240-seat configuration, all doors and exits are activated.

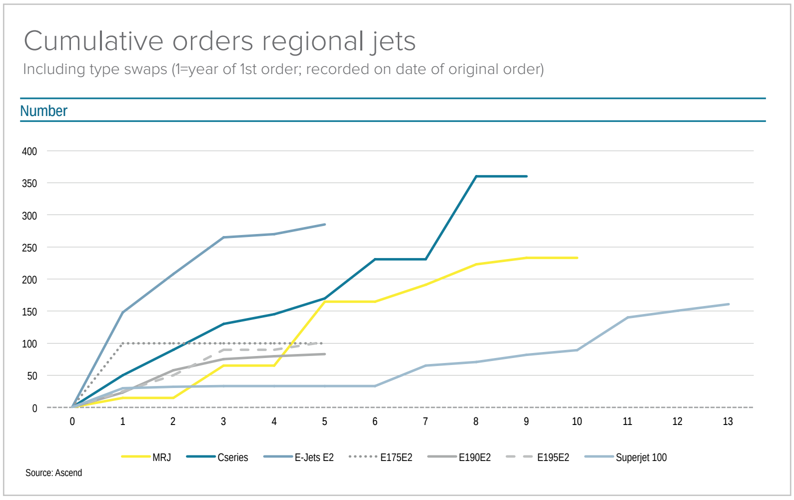
Two new aircraft versions entered into service in 2017. The first A321-200N went to Virgin America in April and the first 737 Max 8 to Batik Air Malaysia in May. Rumours about new versions of existing aircraft types persist, but neither a stretched A350-1200XWB, nor an A322, a redesigned winglet equipped A380 Plus, a 777-10X or a CS500 were launched.

The much-debated Boeing 797 or middle-of-the-market jet also remains a longer-term project. The dilemma seems to be that, on the one hand, this aircraft should be Boeing's successor to the 757 and an answer to the success of the A321neo; on the other hand, an aircraft positioned in the market niche below the 787-8, where once the not extremely successful 767-200 and A310 could be found. At the Paris air show, a 797 impression was shown to the press. Reportedly, the small twin-aisle jet will be suitable to serve between congested airports on US trans-continental routes, but should also be able to operate on transatlantic routes of up to 5,200 nautical miles, or just over 10 hours. Capacity will be between 220 and 270 seats.

In terms of sales successes, while last year the Bombardier CSeries still booked a decent number of new orders, during 2017 to date significant order volumes could only be added to the A320neo and A320ceo and 737 Max backlogs.

Commercial jet orders during the first eight months of 2017 were 35% from operating lessors and 63% from the airlines. The biggest confirmed order this year (as of 1 September) was placed by GECAS for 103 A320/321neo aircraft. Second came China Aircraft Leasing, which ordered 50 737 Max aircraft.

The biggest airline order – pending the confirmation of a Lion Air order



for 50 737 Max aircraft – came from Delta Air Lines, placing an order for 40 A321s. The order for 100 737 Max 10s was not a new order but just a variant change. Maybe the most remarkable order came from lessor AerCap, ordering no less than 30 787 Dreamliners next to a handful of A320s and two E-Jets. Easyjet ordered 30 A321-200Ns.

Aviation Capital Group added 20 737 Max aircraft to its orderbook, next to three A321s. Air Lease (ALC) Corp spread its risk by ordering both 12 Max aircraft and 13 Neos, plus two 787-9s. Another rare order for big twin aisles came from China Southern Airlines, which committed to buy 20 A350-900s. Ethiopian committed to 10 aircraft of the same type, while Canadian Westjet ordered 10 787s. BOC Aviation, JP Lease Products & Services and Ryanair ordered 10 737 Max aircraft each. Apart from these, the remaining orders were all in single-digit volumes.

Overall, it is a good year so far for the 737 Max and A320neo families and, in the context of the relatively soft twin-aisle market, for the 787-9.

Looking beyond the most recent (lack of) sales successes, how are the various programmes progressing? The table, which includes a few corporate jet versions as well, shows the current backlog by aircraft family and main versions or variants. With 5,019 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. The CFM LEAP-powered A320/A321neos are in the lead over the Pratt & Whitney GTF version, but a large number of orders has an undecided engine selection.

Obviously, the A320neo engines have been a hot topic in the past few months. Production volumes of, in particular, the Pratt & Whitney PW1100G geared turbofan is falling 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, reportedly over the first seven months of 2017, only 68 A320neos were delivered (of which 48 were LEAP-powered).

Apart from the slower production of the Pratt engine, 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 downs. Pratt indicated that later in 2017, new – redesigned – parts would be introduced to solve some of these issues.

Interestingly, some airlines announced that because of the issues around the new engines, demand for the current-generation 737NG and A320ceo seems to have received a positive impulse. Wizz Air, as an example, announced it had decided to add more A321ceos to its fleet instead of Neos, awaiting the PW1100G to reach operational maturity. The backlog for the NG is still a significant 597 and, for the Ceo, still 491, indicating the Airbus product is a little further in the generation change process.

The share of the 737 Max family in the single-aisle backlog seems to be falling behind the A320neo, although admittedly the 737 Max was launched some months after its European competitor. Splitting the combined A320neo/737 Max backlog gives the Airbus family a 57% share, versus 43% for the Boeing range.

Within the Boeing 737 Max family, the Max 8 is clearly the most popular version. Its backlog of 2,071 (2,281 including the Max 8-200) dwarfs the backlogs of the Max 7, the Max 9, as well as 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 1,093 737 Max orders for which the exact version remains undecided or unannounced.

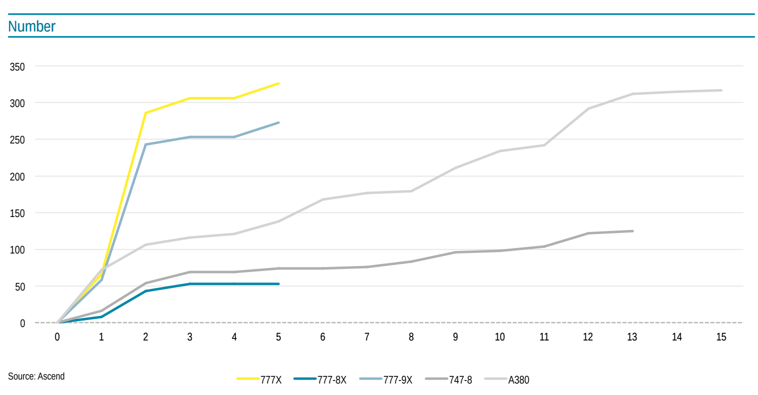
With a rather unimpressive backlog for the regional jets, the A350 and 787 twin-aisle families take third and fourth position in the current backlog chart, despite a softening of the twin-aisle market. The A350-900XWB features an orderbook of 521 aircraft, supplemented by 212 orders for the stretched -1000XWB and – on paper – eight orders for the A350-800XWB. The latter is unlikely to be produced and it seems the type will be cancelled as soon as an agreement between Airbus and its sole remaining customer, Asiana, has been reached.

Within the Dreamliner family, the -9 is clearly the most popular version and with a very limited order inflow over the past few years for the shorter -8, the -9 is likely to become the standard version going forward, similar to the -300ER as standard version of the old 767 family. 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 168, there is still some ground to cover.

In the regional jet market, Bombardier could not maintain the sales volume of 2016. With orders from Air Canada and Delta Air Lines, it looked like 2016 was the breakthrough year for the Canadian product. So far,

Cumulative orders (very) large twin aisle jets

Including type swaps (1=year of 1st order; recorded on date of original order)



there have not been any new orders announced during 2017. However, compared with other regional jets, the CSeries is not lagging behind and, in terms of order volume, is in the lead with a backlog of 342 aircraft and some very "interesting" sales campaigns, reportedly including Air Asia.

The competing – equally PW1000-G-geared turbofan powered – Embraer E-Jet E2 family was launched years after the CSeries and seems to accumulate orders at a slightly faster pace. The total backlog of 288 aircraft 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-Jets E1, still enjoy a backlog of 119 aircraft. The E175-E1 has proven especially to be very popular among the US regional airlines.

Unfortunately for Embraer, the E175-E2 is not scope compliant. Under current scope clauses, the E2's maximum take-off weight (MTOW) is slightly too high. Scope clauses limit the number and capacity as well as the MTOW of aircraft that are allowed to be 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 contract with the Air Line Pilots Association (Alpa) limits it to 255 large regional aircraft (up to 76 seats and MTOW of 86.000lb). Delta Air Lines will follow in December 2019 and American Airlines at the end of 2020.

The same issue is causing Mitsubishi Aircraft Corp headaches, because its MRJ90 is in the same situation. The MRJ90 can be configured with up to 90 seats, although 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 87,300lbs for the MRJ90STD to 90,300lbs for the MRJ90ER and just over 94,000lbs for the MRJ90LR. Restricting the MTOW to 86,000lbs would result in a clear range shortfall with passengers on board.

The MRJ90's backlog has been stuck at 233 since last year, because no new orders have been announced in recent months. Taking into account the time since the launch of the programme, the MRJ is losing ground against the CSeries as well as the E-Jet E2. The first MRJ delivery to All Nippon Airways is still scheduled for mid-2020, but a recent flameout of the PW1200G engine during flight testing near Moses Lake in the US was another unexpected set back for the programme, but so far this seems to have no consequences for the entry-into-service date.

In July, Russian airline Aeroflot ordered 10 more of the Russian/Italian UAC Sukhoi Superjet SSJ100. The first order for this aircraft type was placed 12 years ago and sales volume has reached about only 170 aircraft during that entire period. Within the Russian civil aircraft-manufacturing world, a major reorganisation is taking place and United Aircraft is to combine MS-21 airframe builder Irkut with Sukhoi Civil Aircraft, the producer of the Superjet.

Italian aerospace firm Leonardo disclosed earlier this year that it had sold its share in Sukhoi Civil Aircraft and SuperJet International to United Aircraft. Under a new Russian government proposal, Russian airlines will need to have a proportion of domestically produced aircraft in their fleet in order to obtain an operating certificate, which may be positive news for both the MS-21 and the Superjet. This change to the federal aviation regulation is intended to stimulate the use of new Russian-built aircraft.

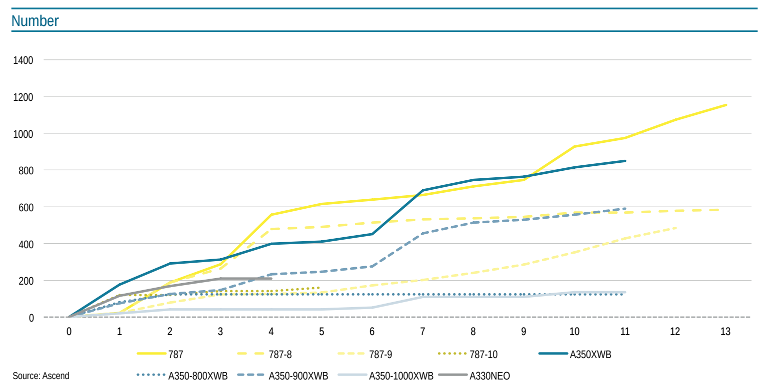
In more hardware-related news, Sukhoi completed tests of a new wing structure capable of taking winglets. Sukhoi says installation of what it calls the "saber winglet" will boost the Superjet's fuel efficiency and increase its range "not less than 3%". Take-off and landing performance will also be improved. The winglets will be optional on new aircraft and not a retrofit solution.

Moving back to the larger twin-aisle aircraft, the A330ceo's backlog is still about 100 aircraft. About 75% of this is for the A330-300 high gross weight (HGW) version, but Iberia and ACMI operator HiFly ordered a few more -200s as well this year. Despite about 50 aircraft in storage and about 37 retirements (mainly non-HGW -300s), the A330ceo still is a workhorse for many operators. Some airlines expressed the desire to acquire additional used A330ceos to supplement their fleet. Looking at prevailing market values and the low fuel cost, the A330ceo is an excellent entry-level twin aisle, with the -200 and -300HGW variants showing decent long-range performance.

Airbus launched the A330neo to plug the gap left behind by the cancelled A350-800XWB. At that time, fuel costs were still relatively high and the fuel cost savings offered by the A330neo looked interesting,

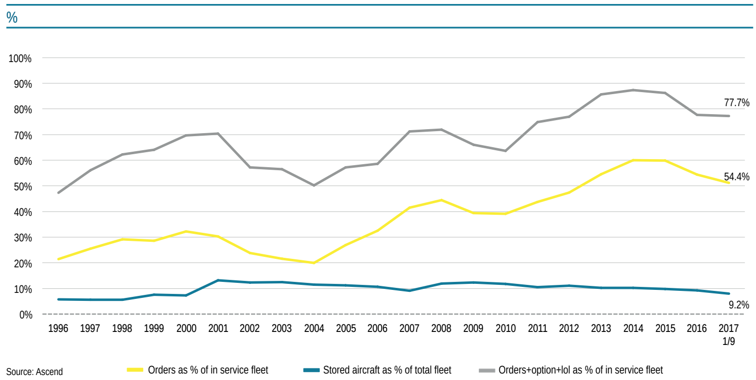
Cumulative orders medium/large twin aisle jets

Including type swaps (1=year of 1st order; recorded on date of original order)



Source: Ascend

Aircraft on order (& option + lol) and in storage as % of fleet



especially in combination with 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 116 orders in the second half of 2014. However, in 2015, the new order intake dropped to 52. In 2016, Airbus sold only 42 A330neos, of which 28 of the Rolls-powered aircraft are destined for Iran Air. No Neos have been sold in 2017 to date, although Iranian Zagros Air signed an LoI for eight aircraft.

Similar to the A350-800, the shorter A330-800 does not seem to be too popular, with only one order (six plus six) from Hawaiian Airlines. Does it really make sense to build an aircraft for effectively one customer? The A330-900 enjoys a certain popularity with the lessor community, as ALC and Avolon (including CIT) committed to the type. Air Asia X (66) and Delta Air Lines (25) are the largest A330neo customers next to Iran Air (28).

Like the move from Neo to Ceo in the A330 product range, Boeing is facing a similar transition for its large twin-aisle 777 family. Since January 2016, Boeing has booked about 37 orders for the passenger version of the current 777. Qatar ordered 10 last year, United two times four and Air China six. A remarkable 12 orders placed in 2017 remain unannounced. Reportedly, the pricing of these “last-of the-line” 777-300ERs is very attractive, which could have been a factor in United’s decision to convert 10 787 orders to 777s in 2015. Apart from the -300ER, there are still 31 777-200LRF freighters in backlog.

This very popular long-haul freighter has found its way into the FedEx fleet and this integrator has been a repeat customer for the type in 2016 and 2017. FedEx still has 10 freighters on order, Hong Kong Airlines six, Eva Air five and Qatar Airways four. 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 of many airlines.

It remains unclear if Boeing or Bedek IAI will eventually launch a passenger-to-freighter conversion programme for the 777-200LR. If launched, the payload/range performance of this converted freighter is expected to closely match that of the factory freighter. Unfortunately, the potential feedstock fleet for such a conversion programme remains limited.

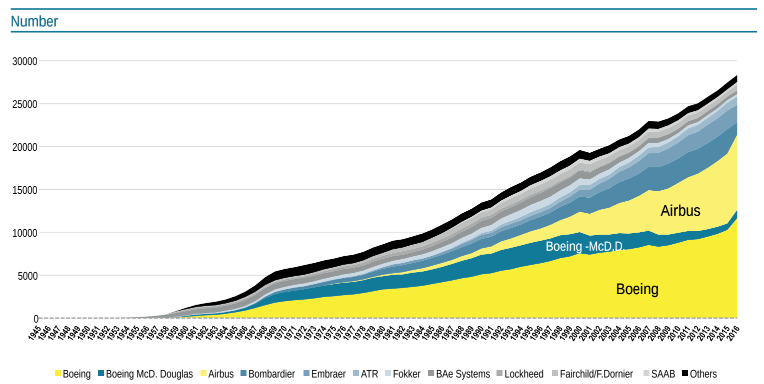
The new-generation 777X has already clocked up an impressive number of orders for such a large aircraft. However, out of the total of 326 orders, the vast majority of 235 is coming from the three big Middle East carriers, with Emirates airline having signed up for no less than 150 of the type. Cathay (21), ANA (20) and Lufthansa (20) are the main non-Middle East customers along with 30 for unannounced commercial operators. Singapore Airlines preferred the 777-9X over the A350-1200XWB in a recent campaign and has an LoI for 20 aircraft from the Seattle-based manufacturer.

Should the big quads, the 747 and A380, follow the other quads and tri-jets into the aviation history books, Boeing again dominates the top end of the market with the 777-9X, unless Airbus decides to launch the stretched A350-1200XWB. Such an aircraft would probably be another nail in the coffin of the current A380, which makes this a tough decision for Toulouse.

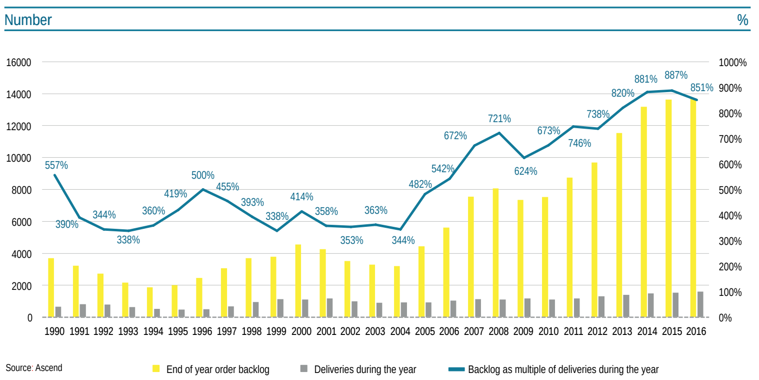
In the top segment of very large aircraft, Boeing has the 747-8 passenger aircraft as a contender next to the future 777-9X. Airbus has put the mighty A380 against this duo. Both the 747-8 passenger jet and the A380 are struggling to find new orders.

The Boeing product survives for the time being on a few orders for the -8F freighter version, but the US manufacturer announced that the 747 production will be reduced to half an

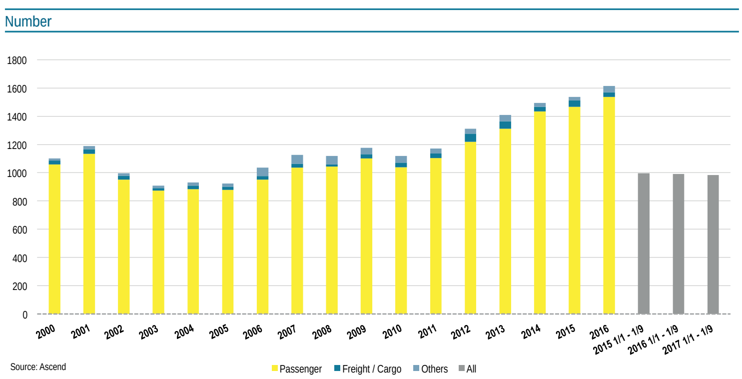
Western built, in service commerial jets & turboprops – by manufacturer (by end of 2016)



Commercial jet backlog development



Annual deliveries – western-built commercial jets all civil operators



aircraft per month, which with the 18 aircraft-strong backlog (of which 14 freighters go to UPS) implies production ending about 2019. Boeing even admitted it could end production of the 747.

Airbus announced it would reduce A380 deliveries from 27 last year to 12 in 2018 and eight in 2019. The backlog counts 102 aircraft, of which 45 are destined for Emirates. Amedeo has committed to 20 aircraft, Qantas to eight more and Virgin Atlantic to 10 more. Realistically, it is difficult to see Amedeo 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, it seems unlikely that investors would be eager to take asset risk on this aircraft type.

Qantas and Virgin Atlantic reportedly expressed that they do not intend to take delivery of the aircraft, so overall a realistic backlog may be 70 to 80 aircraft. A new version – dubbed the A380plus – was proposed during the Paris air show.

The A380plus features a modified wing, bigger winglets, a lighter and improved waste system, new fuel pumps, new interior options, new belly fairings, etc, plus a three-tonne increase in MTOW. It remains to be seen if this "plus"-package will be enough to revive the market interest in the A380.

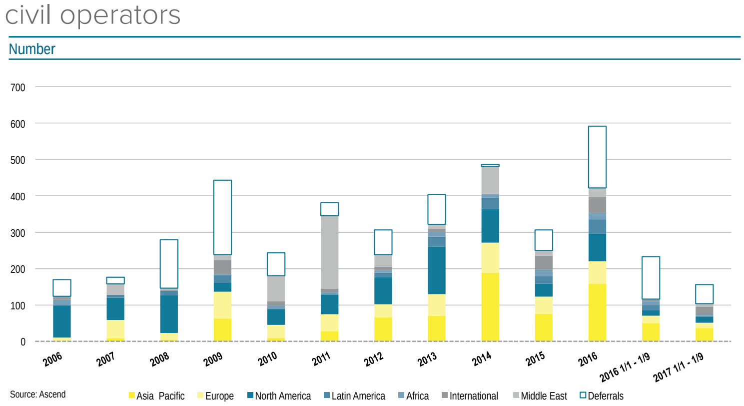
Despite the disappointing sales volumes in the first months of 2017, the manufacturers do not have to worry too much because the global fleet is still growing fast.

Looking at the big picture, the rise of Airbus has been spectacular and one wonders if 25 years from now a major Russian or – more likely – Chinese original equipment manufacturer (OEM) will feature in a similar chart.

Shorter term, Airbus, Boeing, Embraer, Bombardier and the other OEMs can enjoy a backlog, equal to 8.4 years of deliveries at 2016 levels. This figure, however, is down from the nine years record level achieved in 2015 and 2016. In reality, the backlog can be delivered over a shorter time period because the OEMs will increase their annual production levels as soon as they regain control over their suppliers.

As previously mentioned, the limits in production capacity is one of the major elements that protects commercial aviation from the Armageddon in the shipping markets. As of September 2017, the commercial jet backlog stood at 54.4% of the in-service fleet, significantly lower than the peak level of about 60% from end-2014,

Cancellations & deferrals – western-built commercial jets all civil operators



early-2015. Whatever the cause, huge backlogs, low fuel prices, over-ordering or economic headwinds, there are now strong indications that the new equipment market is past its peak. This is not dramatic and had to happen one day. For the first eight months of 2017, *Flightglobal* recorded 984 deliveries, slightly down on the 991 over the same period last year. Much of this seems to be because of delays in A320 and A350 deliveries, caused by engine respiratory interior suppliers issues. Recent reports indicate that despite all efforts, A320neo delivery levels are far away from their target levels.

With respect to order deferrals and cancellations, the first months of 2017 also show a picture that seems to indicate fundamentally the equipment market is still healthy.

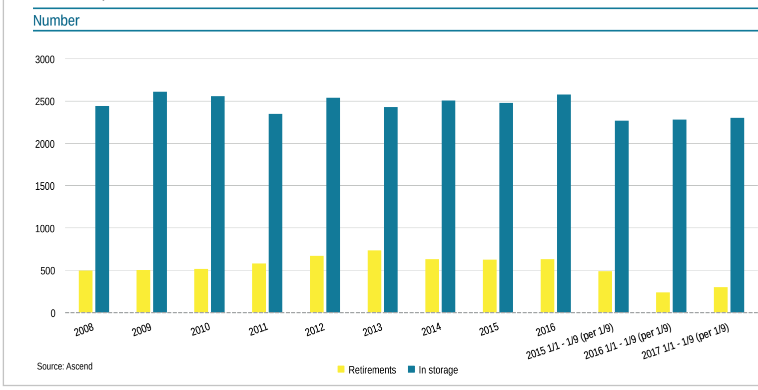
There is no complete transparency regarding order deferrals and cancellations, and it is unlikely all agreements to cancel or defer are included in the published industry statistics. In the past, orders from defaulted carriers such as Kingfisher, for instance, stayed on the orderbooks for a long time, probably for legal reasons. Based on available data, the number of cancellations for the first eight months of 2017 came down to 104, versus 116 during the same period in 2016. Defaulted 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. Air Europa cancelled four 787-9s. The remaining cancellations were generally "onesies" and "twosies". Frequently, cancellations of orders for a NG or Ceo, for instance, were compensated by an order for a Max or Neo.

The number of cancellation was relatively low and, equally, the number of reported deferrals decreased to 52 from 117 for the first eight months compared with 2016.

Delta, American and United deferred a total of 22 A350-900s. Virgin Australia deferred nine Max 8s and Horizon six E175s. Jetblue deferred 10 A320/A321neos.

For mid-life and ageing aircraft, the number of retirements increased from the extremely low 239 recorded during the first eight months of 2016 to 302 in the same period of 2017.

Storage and retirements – western built commercial jets all civil operators

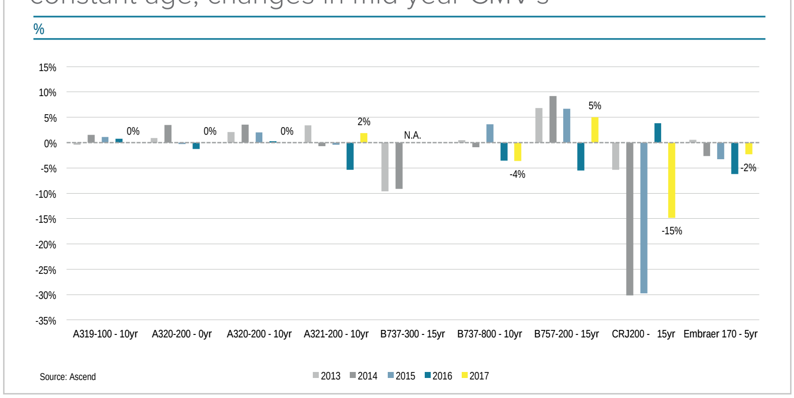


It should be taken into account that sometimes retirements occur because, for an aircraft lessor, the sum of the return compensation (for aircraft that do not meet the agreed maintenance condition) plus the proceeds from a part-out are more attractive than re-leasing the aircraft to a second-tier lessee. This is especially the case if the new lease would require a cash-out to pay for a new or refurbished interior. Over the past 12 months, 60 757s were retired, 49 MD80s, 37 A320s, 33 CRJs, 30 747s, 29 737 Classics, 27 767s and 17 A340s. More modern types were also cut up, including 24 737NGs, 15 777s and 12 A330s. The number of aircraft in storage stayed relatively stable at 2,303, slightly up against a year ago (2,282) but not if expressed as a percentage of the in-service fleet (now 9.2%). Aircraft leaving storage can be good news – if redeployed – or bad news – if broken up – so, as such no conclusions can be drawn from small changes in the storage numbers.

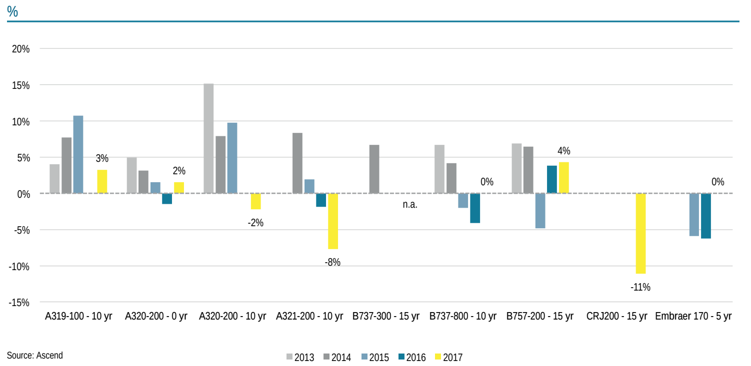
Used equipment market

For investors and financiers, it is important to analyse what the impact of the ongoing generation change is – or will be – on the used equipment market and, in particular, on aircraft values. 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, such as lower purchase prices or lower lease rates. Obviously, in the current situation with relatively low fuel prices, the monetary savings in terms of operating cost offered by a modern – fuel-efficient – aircraft are relatively modest. Ignoring other benefits of the new-generation aircraft (range, maintenance cost, passenger appeal, environmental impact, etc), the premium of the new-generation

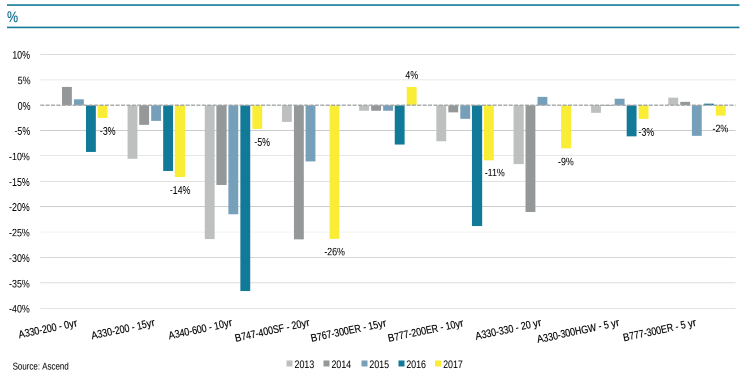
Market value dynamics – single aisles aircraft of hypothetical constant age, changes in mid year CMV's



Market lease-rate dynamics – single aisles aircraft of hypothetical constant age, changes in mid year CMLR's



Market value dynamics – twin aisles aircraft of hypothetical constant age, changes in mid year CMV's



jets over the older products should be more modest, compared with the high fuel environment of a few years ago.

With respect to new aircraft pricing, there are no public domain data with respect to average net transaction price levels, for instance. As a proxy, we use independent appraiser data for zero-year-old aircraft – in this case, data from *Ascend*. We have reflected the difference between estimated mid-year market values. 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 with a solid longer-term lease currently command 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 that have the capability to arrange a new lease for the aircraft.

To analyse used equipment prices, we have compared Ascend's published current market value estimates for the mid-year points in 2013, 2014, 2015, 2016 and 2017. In the graphs, we have used constant age values for hypothetical aircraft of an age that can be seen as representative for the type. Consequently, the value dynamics do not take value effect of the physical ageing of an aircraft into account.

As airline-to-airline transactions with naked aircraft seem to have become a minority of the transactions involving commercial jets, a debate has started about the relevance of appraised values that do not reflect the value of the attached lease. It seems that especially aircraft lessors, investors and traders are eager to see appraised values, including the value of the lease and even the contractual return conditions. As the market has become more competitive, it is important to recognise every dollar of value in a transaction. It is, however, challenging to appraise an aircraft with lease attached, without including all relevant details of the contract and applying an adjustment factor for the potential risk an airline/lessee is not willing or able to meet all its contractual obligations. As an example, a 10-year lease contract with Lufthansa clearly has more value compared with a similar contract with a carrier on the verge of bankruptcy.

Given the various forms of transactions, it is difficult to quantify the size of the used equipment market. It seems simple airline-to-airline "metal" 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 (such as 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 the past months, the market for modern single aisles has been strong.

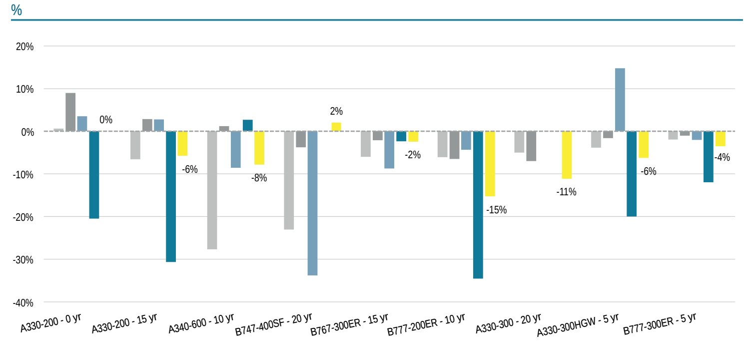
Current technology aircraft such as the 737-800 and A320ceo can remain competitive versus the 737 Max and A320neo longer than originally anticipated because of the lower fuel cost.

While again difficult to quantify, the impression is that lease contracts for NGs and Ceos are more frequently extended, giving the airlines the combined benefit of lower lease rates/capital cost and modest fuel cost. The flip side of this is that operators which did not commit to Neos or Max aircraft in the years of high fuel prices can now probably negotiate a much lower lease-rate premium for the new-technology aircraft. In terms of storage numbers, it is interesting to note that, over the past two years, we have not seen a dramatic increase in stored (in-production) single aisles. Obviously, the number of stored aircraft can diminish because aircraft are broken up as well as returned to service. The only single aisle that has seen a significant increase in stored fleets between 1 September 2016 and 2017 is the 737-300 model. This may be the result of Southwest parking a large number of these Classics. This may be caused partially by the introduction of the 737 Max and the complexity of combining pilot type-ratings for Classics, NGs and Max aircraft. Most of the other major commercial jet types have seen storage numbers come down, either by scrapping or redeployment.

During the past 12 months, the twin-aisle market seems to be much more challenging with potentially significant changes in the perception of some so far popular types. A few years ago, it was obvious that aircraft such as the 747-400 and A340 were falling out of favour. Despite some transactions seeing the A340-600 find new homes in Iran, values went down or rather it became more widely recognised at what extremely low levels these aircraft were trading. Passenger 747-400s are rapidly disappearing from the skies but even the freighter version is in surplus. The 747-400SF as a converted freighter does not offer the benefits of the nose-cargo door that a factory-built freighter brings, and both the Boeing-converted BCFs as well as the IAI-converted BDSFs were parked in large numbers as a result of the crisis in the air cargo market. A recovery for this type seems unlikely.

For younger 747-400(ER)Fs, the longer-term outlook may be more positive. Should Boeing decide to discontinue 747 production, -400(ER)Fs and 8Fs are the only remaining western-built nose-loaders. Demand for this feature in the outsized cargo market is likely to continue for many years. The most interesting – and relevant – twin-aisle families for the financial community are A330s and 777s. Both types have enjoyed significant popularity with lessors, investors and bankers. The share of operating lessors in the A330 fleet is, at 42%, almost at single-aisle level. The 777-300ER comes close with a lessor share of 36%, while the 777-200ER fleet is predominantly owned by the airlines because the lessor-

Market lease-rates dynamics – Twin aisles aircraft of hypothetical constant age, changes in mid year CMLR's



Source: Ascend

managed percentage is just about 20%.

Within the A330 family, both older and newer vintages still underwent a downward value correction.

According to Ascend, younger A330-200s lost about 3% and older about 14%. Older A330-300s lost about 11% against only 6% for the younger HGW version. It remains to be seen how values for these two twin-aisle families will develop in the coming years with a significant number of lease returns scheduled till the end of the decade.

Larger twin-aisle jets have proven to be challenging in terms of remarketing potential, partly because top-tier airlines generally prefer new equipment and partly because of the high transition cost. New interior parts are expensive and with interior manufacturers not even capable of delivering interior parts for new aircraft in time, reconfiguring a used twin aisle may be very time consuming. For the A330-300, cargo conversion may be a realistic option, although history has shown that cargo-conversion programmes do not really help residual values of feedstock aircraft.

Over the past year or so, the 777-200ER was probably the aircraft that was hit hardest. Also over the past 12 months, values dropped another 11%. The 747-400SF outperformed all other twin aisles with a value drop of 26%. 777-300ERs stayed relatively stable with a drop of only 2%. Most positive, probably thanks to demand from the passenger-to-freighter market, was the 767-300ER (up 4%). In the single-aisle markets, not many unexpected or spectacular value movements were noted. CRJ dropped further but 757s enjoyed a slight improvement. Most other changes were minor corrections.

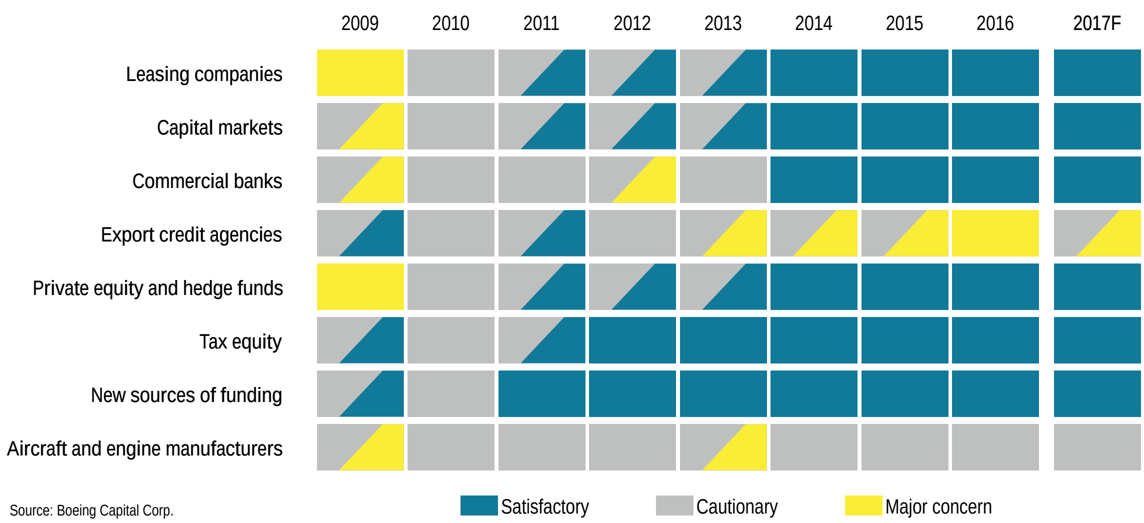
In line with this perception, lease rates have come down as well. Older A330-200s and -300s and the 777-200ER came down by an estimated 6%, 11% and 15%, respectively. The 777-300ER did not suffer as much, yet, but this is also a type that needs to be watched in coming years. Single aisles generally saw a positive move in lease rates, except minor negative corrections for older A320s and A321s and another big drop for CRJ200s.

Finance environment

It is always a challenge to form a picture of the current aircraft finance market environment. Probably the major OEMs are best positioned because they are the only ones that know all the details of the majority of transactions. Boeing Capital (BCC) annually publishes some data about the finance environment. At their conferences in Tokyo, London and New York, the company also conducts surveys among the attendees.

During the BCC conferences, the majority of voters believe there is too much capital available for aircraft financing. Some 61% of voters agreed with this in Tokyo, 62% in New York and a massive 73% in London. These numbers are up significantly compared with the 2016 survey. Only 1% to 3% of voters believed there was a shortage of capital. This strong – some would say "overheated" – aircraft finance market ensures that aircraft with decent leases attached

Aircraft financing markets

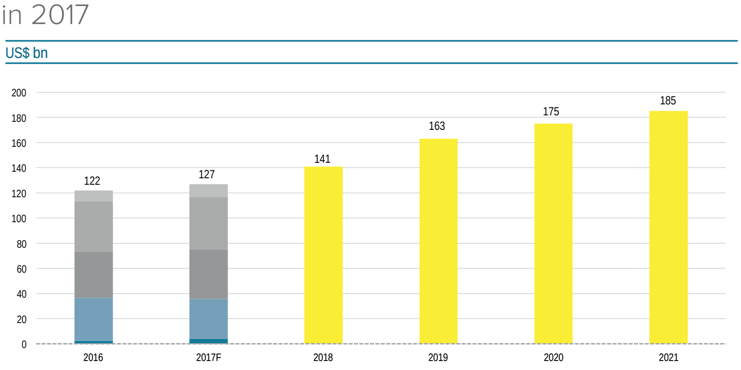


Source: Boeing Capital Corp.

continued trading at very high levels. As mentioned before, 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, it seems that the good times are continuing, except for export credit. The problems in this segment have been described in this article already. Airframe and engine manufacturers are also "yellow", which probably indicates that there is no real desire from the side of the manufacturers to step in. In several cases, however, the OEMs were forced to help carriers where ECA/ Exim finance was not forthcoming or delayed. For the commercial banks, these situations also offered opportunities for bridge facilities, awaiting the reopening of Exim/ECA. The uncertainty about ECA/Exim take-out financing also has an impact on predelivery payment (PDP) financing. The attractiveness of this type of facility for the financier generally is based on the fact that the asset will be in a relatively safe jurisdiction prior to delivery (France, Germany, the US, etc) and that, in most cases, there is a reasonable probability that there will be take-out financing at the time of delivery. Apart from several legal issues, the main risks materialise if the original customer defaults before the delivery date. The OEMs tend to set the assignable purchase price (the purchase price for which the PDP financier can take over the asset in case of a default by the original customer) often at absurdly high levels, compared with the agreed real purchase price. While this policy stems from a concern that financiers should not benefit from a default of the original customer, it means that, in many cases, the airline customer has to inject significant amounts of equity into the deal. While for strategic aircraft types, the OEMs are likely to help out the PDP financier, this may not always be the case. Under such a scenario, the reconfiguration cost could be an unexpected and unwelcome additional cost element.

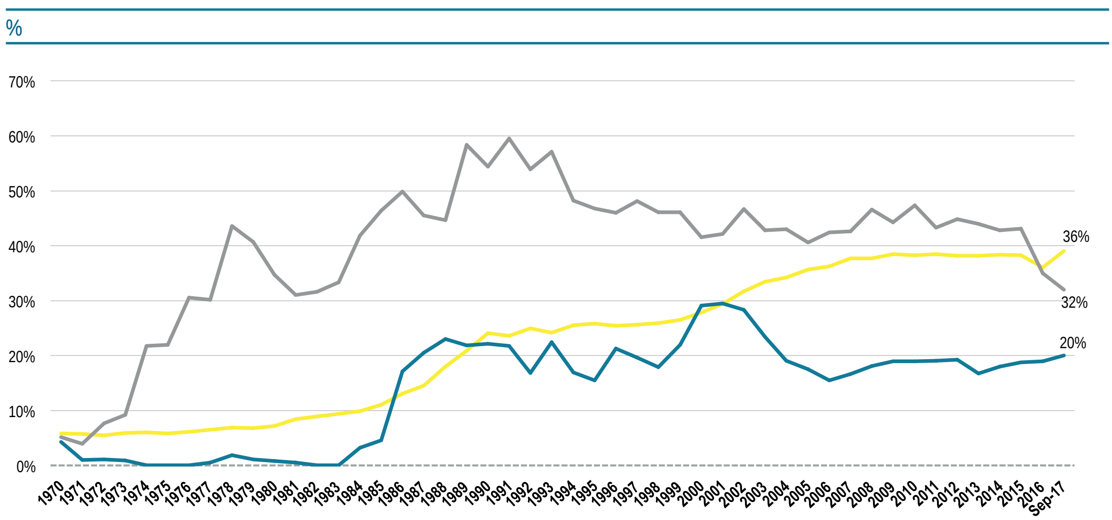
Overall, however, there certainly is no more funding gap in the industry. In the Boeing chart, effectively "leasing companies", capital markets", "private equity/hedge funds" and "commercial banks" could be printed in the brightest green available. The Boeing survey indicated that industry insiders expect that over three years, the operating lessors will be the largest source of aircraft financing. The percentage mentioned in the three cities fluctuated between 56% and 57%. Currently, lessors manage 36% of the commercial jet fleet (western built, all civil operations) in service, 32% of the aircraft in storage and "only" 20% of the jets on order. Based on the survey, there apparently still is room

Financing forecast for global commercial airplane deliveries in 2017



Source: Boeing Capital Corp.

Lessor's share global fleet western built jets



for growth in aircraft leasing.

In all three financial centres there seems to be an agreement that next to leasing, the capital markets will fulfill 20% to 30% of the finance need, with the remaining difference largely made up by commercial bank debt. It should be taken into account that lessors rely largely on capital markets (37%), bank debt (36%) and internally generated cash (25%). For the survey period, export credit is seen at an insignificant 1% to 2% of total market funding (airlines and lessors). The latter implicitly reflects the optimism in the industry. Export credit agencies had to come to the rescue during the 2008-10 crisis to prevent airlines falling into the funding gap. A repeat of this scenario is apparently not expected.

Again, according to the benchmark Boeing figures, the industry will need an estimated $126 billion to pay for the 2017 commercial jet deliveries. While this is a staggering amount as such, it now looks like this will not be a problem at all. Asian investors, in particular from China, have indicated they are eager to each invest billions of dollars into commercial aircraft financing. Bohai Leasing, part of the HNA Group, does not shy away from investing a few billion in commercial aircraft either. After having set up Hong Kong Aviation Capital, the Chinese travel, tourism and logistics company acquired Avolon for about $2.5 billion. And subsequently Avolon took over the aircraft-leasing arm of CIT Group for an estimated $10.4 billion. This moved the combined HKAC/Avolon/CIT fleet to third spot in the lessors' ranking right behind mega-lessors GECAS and AerCap. In terms of fleet size, GECAS still takes top spot, AerCap a close number two and Avolon a more distant number three. It is interesting to note that during the past months, more and more observers have started to express concerns about the rapid expansion of the HNA Group. Very few have a good insight into the financial structure of the company. In recent press reports, Avolon has insisted it remains unaffected by the growing scrutiny of its parent, HNA.

A number of recent reports indicated China's government was clamping down on some of its biggest global deal-makers amid concerns about their debt-fuelled buying binge. It seems there are hardly any limits to the appetite of the Chinese investors to acquire commercial jets. Apart from the fact that commercial jets, as one of the few asset classes, were not significantly affected by the recent economic crisis, Chinese investors are eager to invest outside of the country and into dollar-denominated and dollar-earning assets. Aircraft are expected to offer protection against currency movements and are expected to offer acceptable yields in a world where interest rates have hit rock bottom and, in some cases, even turned negative.

Will this new gold rush come to a happy end? Experienced aircraft traders complain that aircraft transactions now take place at unrealistically high price levels. Airlines indicate they get extremely competitive offers for sale and leaseback transactions from less-experienced entities that apparently have huge risk appetite and/or are counting on bullish residual value assumptions. As indicated, probably the fundamental economics of these transactions are less important than the protection they offer against exchange rate risks and other monetary risks.

Apart from Chinese investors, Dubai Aerospace Enterprise (DAE) completed the acquisition of the AWAS group of companies and this moves the Middle East company into the top tier of global aircraft lessors.

Other significant investments in aircraft portfolios are frequently made by Japanese investors, North American private equity firms and pension funds. These latter categories in many cases transfer the risk to others, including private investors and employees that expect to benefit from pension schemes. For the fund managers, it is very difficult to find any meaningful investments that generate acceptable yields to fulfill pension obligations or offer competitive investment returns. Hopefully, investors in aircraft have taken into account that, contrary to stocks and bonds, aircraft are subject to technological risks. Low fuel costs are extending the lives of midlife and older generation aircraft, but should fuel return to previous levels, the old-generation aircraft will be rapidly replaced by more efficient new-technology equipment. The fact that lessors and financial investors own a significant share of the world fleet may facilitate a relatively quick transition, because airlines will not have to deal with book losses on these leased aircraft.

While much of the investment funds are aimed at (near) new equipment, significant investments are now also aimed at what once was a niche market: mid-life and end-of-life aircraft. Anticipating bonus income from lease-extensions, monetary return compensation for below-agreed aircraft condition and anticipated proceeds from aircraft and engine part-out, should result in above-average returns. With reported asset-backed securities transactions for anything ranging from nearly new via mid-life to older aircraft from DAE ($411 million), Elx Aviation ($410 million), Apollo ($510 million and $640 million), Aergen ($325 million), Castlelake ($916 million), Blackbird ($800 million) and GECAS ($709 million) this can no longer be called a niche market.

The volume of EETC transactions reported in 2016 came down from 2015 and reached the level of $5.3 billion, down from $6.7 billion. The majority of paper came from US majors American ($3 billion) and United ($2 billion). As an outsider, Norwegian tapped the market for $300,000,000.

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, the big US banks dominated the market. Later, the centre of gravity moved to Europe, followed by Japan. According to BCC, China will be the major source of bank debt for commercial aircraft deliveries with 31% of the market in 2017. Japan will still be a respectable second (15%), followed by Germany (12%), France (8%), Australia (7%), the Middle East (6%) and the US (5%).

Outlook

So, with all of the above in mind, can we answer this simple question: "where are we in the cycle?" Like last year, this is still difficult. In general, it seems the industry is on a relatively high plateau. A complicating factor is that in our industry there are many cycles. To start with the simplest cycle, the technology cycle. It seems we are right in the middle of a fleet-wide generation change. Arbitrarily allocating new-technology aircraft types, in the regional jet market, the Superjet is now a small but established aircraft. The CSeries also has entered into service but is still in an early stage. The Embraer E2 and Mitsubishi MRJ are still to enter service.

In the single-aisle market, the A320neo has entered service and so has the 737 Max. Looking East, the Russian MS21 and Chinese C919 will also take a few years before service entry but, in May 2017, both types made their first flights. In the twin-aisle market, the 787 and A350XWB are in service and can be spotted at an increasing number of airports. The A330neo and 777X are still in the pre-prototype phase. In the super heavy category, it seems the relatively young 747-8 and A380 are already past their prime and both face an uncertain future.

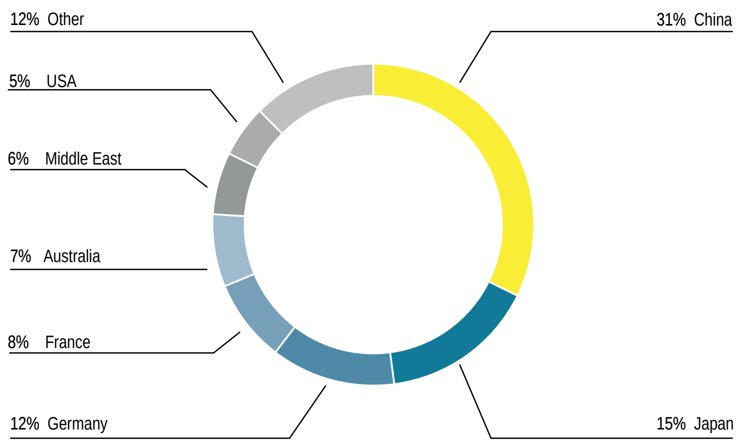
Overall, it can be concluded that we are about halfway through the generation change, or, halfway through the technology cycle. The flipside of all the new aircraft introductions, obviously, is the fact that older generation aircraft will reach the last-of-the-line stage soon. Based on historical experience, this group of late-production aircraft generally loses value much faster compared with early- and mid-production aircraft of the same type. Anybody investing in these last-of-the-line aircraft should take this risk into consideration.

There are three elements that may favour this group. First of all, demand for air travel is still growing at a solid pace. Second, low 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.

Staying with the metal, it is obvious that we are already in a downward

Global aircraft bank debt markets for airplane deliveries

(2017 forecast)



Source: Boeing Capital Corp.

phase with respect to sales volumes, whatever the explanation for this. Given the huge backlog, one can agree with statements from Airbus (and implicitly Boeing) that "aircraft manufacturing is no longer a cyclical business". Even in case of a mild downturn, the OEMs seems to have enough of a backlog to keep the factories going for a few years, under the conditions that (i) there will still be funding available to pay for the delivery of all these shiny new aircraft, and (ii) the market share battle will not result in further short-term increases in production rates. After all, production discipline in commercial aviation is the only thing standing between us and chaos (read a shipping-type crisis).

Moving away from the metal, it seems airline profitability is now close to peak levels. Fuel cost savings are slowly distributed to other stakeholders, including the travelling public and employees. The fuel price remains unpredictable, but assuming another fuel spike, it seems very likely that the world's airlines could dive into the red again. Let's face it, if you cannot make money today as an airline (and several airlines still cannot), when will you? Airlines losing money in 2017 will have difficulty surviving when the going gets really tough.

Finally, aircraft values and the used equipment market. While the decisions justifying the flow of billions 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 still ongoing 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 old adage "the higher they climb the harder they fall" has to be kept in mind.

Already we see clear signs of weakness in the twin-aisle market where the technology change is taking place. Airlines and investors are confronted with disappointing residual values for their expensive twin-aisle aircraft. So, for twin aisles, we already seem to be on the way down. Single aisles still have some time to go, but already we see some of the smart money trading out of their older asset.

Geopolitical, macro-economic and energy-political factors will drive the major changes but, unfortunately, timing for these remains unpredictable. To end on a more positive note, liquid, new-generation aircraft, such as the 787-9, A350-900, A320neo and 737 Max appear to be great investments for many years to come and will almost certainly survive the next downcycle(s).

In summary, the industry seems to be hovering at great heights and there are hardly any real indicators of an imminent crash. Traffic growth is very robust, fuel remains low, financing is plentiful and cheap and most airlines are profitable. Sadly, another positive factor is the fact the travelling public is getting used to terrorist acts and the impact of these atrocities today is mainly on a local level and for a relatively short period.

So, where are the potential dark clouds? A black swan event seems the most likely cause of the next downturn. These are by definition difficult to predict. Clearly, the situation around North Korea is worrying. Another trigger could be a potential major default of, for instance, a Chinese leasing company. As such, it already says a lot that we need to look for events like this to find a potential cause for a downturn. Could our industry after all really be in a supercycle?

INACCURATE OR MISSING DATA

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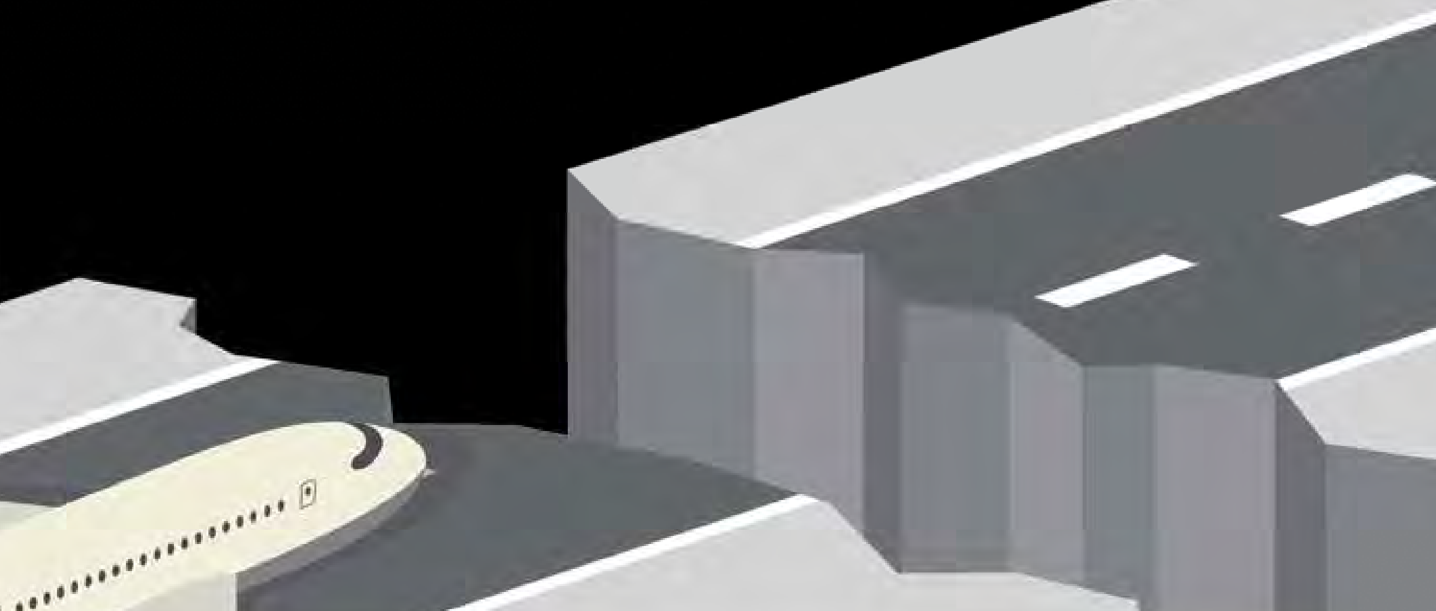
COSTLY LOSSES

- Remarketing aircraft with the wrong MTOW can cost the lessor millions to upgrade
- Capturing incorrect data points on a delivery estoppel can result in paying out more than required
- Missing or unusable records can mean necessary additional major maintenance which can be as much as $20-30M on a Boeing 777
- Inadequately capturing lease provisions can result in the loss of millions of dollars for a lessor



Avoid Costly Losses By Ensuring Accuracy of Your Vital Data

Zeevo Group explores the ever-expanding data requirements within the aviation industry, and how to ensure the accuracy, efficiency, and efficacy of your leasing company's vital data to prevent any outsize impact on your financials.

Sweeping regulatory mandates such as Sarbanes-Oxley (SOX), higher levels of scrutiny and rapidly evolving markets, are making capturing and processing data for aircraft lessors more crucial to success than ever.

Inaccurate or missing data can have an outsized impact on an aviation leasing company's financials. A few common and costly examples include:

- Remarketing aircraft with the wrong maximum take off weight (MTOW) can cost millions to upgrade;
- Capturing incorrect data points on a delivery estoppel can cause miscalculations on a component's maximum top-up exposure, resulting in paying out more than what is required;
- Missing or unusable records can mean having to re-perform major maintenance on aircraft to remarket it. This can be as much as $20-30 million on a Boeing 777; and
- Inadequately capturing lease provisions, such as end of life (EOL) compensation mechanisms, can result in the loss of millions of dollars for a lessor.

Zeevo Group Principal John McCartney puts it succinctly: "Better data means better results." This is certainly true, but leveraging the full power of your data is difficult when you're inundated with it. "It sometimes seems that there is an infinite volume of data required to keep up-to-date information on a single aircraft's technical specifications—let alone a whole fleet of aircraft. Yet employee time is a finite resource," claims McCartney.

The value of accurate data is beyond question, but the extraction, entry, management, and integration of data is both time consuming and fraught with risk. The difficult question for any leasing company is:

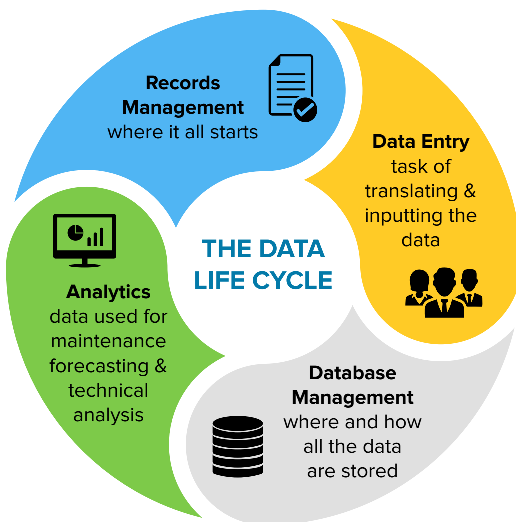
> *"How can we efficiently capture all of this information while maintaining impeccable accuracy, efficiency, and efficacy?"*

When it comes to data management, efficiency entails the useful energy, time and money spent entering and storing data, while efficacy entails the ability of using it to produce the best results. And then there is accuracy. A company can be efficient at data entry, but if the information is erroneous or inaccessible, how much value does it really have?

It is a difficult balancing act to process data with alacrity while ensuring both precision and worth. Plenty of obstacles may impede your company, but given the right tools and procedures, you can overcome these data bulwarks to achieve the intended outcome without integrity or speed loss.

The Data Life Cycle

In capturing the current technical status, projected maintenance cash-flows and asset appraisals for a fleet, there are four principal stages in the data life cycle:



Zeevo Group is well equipped to meet the challenges presented in each of these stages, applying leading-edge processes across multiple systems and platforms. The Zeevo team has faced the difficulties that this involves, and has members with the specific skill sets to ease the burden of data management, so your employees' time is spent fulfilling their primary responsibilities.

Records Management

To best understand the optimal use of data for an aircraft leasing company, one needs to start at the source: the documents.

On any given day, an aircraft lessor can receive or produce countless quantities of vital documents. These include utilization reports, technical specifications, Life Limited Part (LLP) disk sheets, contracts, delivery estoppels, original equipment manufacturer (OEM) manuals and original certificates—the list goes on. Drill down on any of these, and there are more subcategories.

For instance, CofAs and critical maintenance records include maintenance reserve claims with invoices, work scopes, certificate of release (CRS), task cards, etc. With so many records, even the most unflappable data manager can feel inundated and overwhelmed.

And, as anyone who has worked in technical knows, documents can come in a wide array of formats and structures—often with minimal consistency across an entire fleet. Even the file types—PDF, Word or Excel—can vary depending on the source. It is not unusual to have inconsistent formats coming from the same source. As for scanned documents, how many times have you opened a scanned file only to discover that the most crucial information was illegible?

Given the quantity and variety of documents, tracking and storing them can be a headache, but it remains an essential task for an aviation leasing company. The process by which a company does this task is not only important to the people responsible for data entry, but also for mitigating risk and minimizing control deficiencies when auditors come to town. (SOX controls, anyone?)

> *“By having a defined records management procedure in place, important stakeholders for a given document will enjoy increased visibility of when it was received, and can more easily retrieve it when requested by other parties.”*

With regard to improving efficiency, a well-defined records management procedure involves several key steps and functions:

Specifying Your Methodology

The first thing to consider is whether an all-encompassing, uniformed set of guidelines and procedures should be applied to all fashions of records received. Does it really make sense to apply the same methodology for technical records as with legal or contractual ones?

It makes more sense to define distinct approaches that are dependent on the type and purpose of the record. In doing so, a company can be more agile when accommodating the disparate requirements for varying records.

Of equal importance is the selection of an optimal records management system for a company's needs. These management systems are two-fold. One is a document management system for internal storage of records. The other is a maintenance records system to upload records from external sources.

When selecting a records management system, some key points include:

- Document control and versioning;
- Ability and ease of managing access. Can it control access rights for folders by department team members? What about permissions for external parties such as auditors or potential follow-on lessees?
- Security;
- Storage size—how much digital storage space is needed? Keep in mind that a ten-year-old aircraft may have over thirty cardboard banker size boxes of records;
- For maintenance records, is the system stable enough to support the FAR Part 121, Section 121.380 maintenance recording requirements?
- Indexing and use of meta-data that enables ease of filtering and searching for documents; and
- Ability to be integrated with a company's other systems, and initiate workflows when documents are uploaded.

Formulate procedures and process maps for all methods of receiving records (e.g., claims vs. audits)

Employ best practices for scanning documents, including OCR'ing documents & breaking up packets of records appropriately

Select a records management system to store records that allows for searchable (OCR) records and delegation of access

Use consistent naming conventions and guidelines for indexing records

Consider user-friendly technology with proper training and gain team's “buy-in” to avoid GIGO—garbage in, garbage out

Maintain a defined and consistent folder structure

Automate receipt of records uploaded in the field with internal acceptance procedures

Put in place alerts and/or workflows triggered by uploading certain documents

File Organization

For routinely received records, such as utilization reports, having a portal that allows lessees to **directly enter consistently formatted data into a system**—where it can be accepted or rejected (i.e. returned for corrections)—grants visibility to multiple stakeholders while keeping a consolidated track record of the information received.

Furthermore, upon acceptance, the data can then feed into an asset management system for billing and asset status updates. This may also cover a company's internal controls as the data comes directly from the lessee and is never re-typed.

Efficient scanning of documents starts with the selection of hardware and software. Choosing those that produce clean images and automatically OCR documents saves time down the road. Assembly line tactics, where one scans multiple documents at once, separated by identifiable header pages that can then be broken out once in PDF form, are a helpful practice for efficiently capturing large packets of records.

Consistent naming conventions for files and pre-defined folder structures enable relevant stakeholders to easily locate and retrieve documents. A strong naming/categorization convention for a file should contain:

- the date of the document;
- the MSN;
- component serial number, and/or operator it is associated with; and
- the type name of the document (e.g., disk sheet).

These type names are best when pre-defined, including any caveats regarding the variations of the type (e.g., pre-shop visit disk sheet vs. post-shop visit disk sheet).

Consistent folder structures across aircraft or operators ensure that regardless of the MSN, the same document types reside in the same sub-folders.

When **defining record management procedures and implementing record management technologies**, a company should always account for how user-friendly these are. To reap the benefits of these procedures and technologies, employees must be properly trained in how to use the technologies, and procedures must not be too arduous for employees to reliably follow. Systems and procedures that are too laborious become a disincentive for employees to adapt to them. Finding the right equilibrium can optimize the organization of a company's documents.

Data Entry

Having a well-defined Records Management procedure is essential, but all that information has limited use until all the relevant data is extracted and entered into a repository (e.g., an asset management system). After all, who has the time to continuously reference source documentation every time he or she wants to know a handful of data points? While data entry is certainly not the most glamorous aspect of a company, it is one of the most vital cogs for supporting those gears that drive analysis and management decision.

Exploring ways to automate data entry process using data mining from records, lessee portals with direct feeds, and record repositories that may auto-detect record types and appropriate naming conventions, can reduce time and money spent on data entry. The future is now, and technologies are evolving to manage this.

Whether for large scale projects or routine tasks, data entry is a time consuming and often mundane responsibility. Many people have gotten their start within the aviation industry through data entry positions, so it's not hard to find "war stories" of people punching keys and taking names. As these unsung heroes can likely attest, one can get into a groove when keying in data. Nothing can upset that groove more than constantly having to eyeball validation checks and draft related correspondence. Most data entry roles can be summed up by, "How can I do this faster and better?"

When it comes to entering utilization reports or technical specifications, the speed at which the data is entered only matters if it is accurate. Incorrect data entry adversely affects proper invoicing, re-marketing of assets, cash-flow projections, and asset valuation, as well as numerous other areas that impact a company's bottom line. The question is, "how can data be entered or collected in a timely fashion, while ensuring accuracy and keeping the relevant stakeholder apprised of any pertinent information?"

With the use of automated alerts, detective controls, integrity checks, and portals for direct entry, data capturing tasks can be compartmentalized to focus more energy on the actual inputting and collection of data. Such features can free up more time for valued employees to spend on other responsibilities.

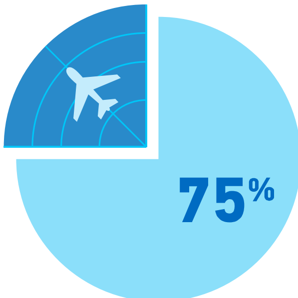
Data entry takes on many forms, but to illustrate the use of these features the focus here is on utilization reports and LLP disk sheets.

Utilization Reports

Entering utilization reports is a monthly activity for an aircraft leasing company. These reports are used for maintenance reserve invoicing and maintaining an up-to-date status on an aircraft. They are pertinent to the Technical department, which uses them to track the status of an aircraft. The Accounting department, uses them to monitor cash-flows and the Marketing department needs them to have the latest and greatest information when pitching an aircraft or engine to prospective lessees.

A utilization data manager has assisted with data entry for a globally recognized aircraft lessor. For a batch of 50 aircraft, she has estimated that it would take around eight continuous hours to just enter the data if no time were spent on validations, reviews, and correspondence.

However, for her typical process she contends that only 75% of her time is spent on entry, with the other 25% spent on validations and correspondence.



That means she is handling roughly 13 fewer aircraft per day than if she had focused more explicitly on entry. So, what exactly is slowing her down and how can it be remedied?

Starting at the beginning, as previously detailed, a lessee portal for the direct entry of requisite data points into a system with follow on workflow triggers limits the manual re-typing of monthly and total utilization by component for a lessor. The workflow increases visibility for when a utilization report has been received, allowing for quicker acceptance or rejection of the data into an asset management system.

Alerts and Detective Controls

When reviewing a new utilization report, alerts and detective controls can inform the enterer or reviewer of any important details from the previous month's utilization. This can go a long way in interpreting any anomalies on the current month's report. For example, if the reviewer sees an alert that an engine had accrued zero utilization in the previous month, it would help explain why there was zero utilization reported for the current month, reducing the need to investigate further.

On the flip side, if the reviewer received the same alert, but the current month's report does show utilization on the engine, then the reviewer knows that the engine is no longer grounded, and the relevant parties can be informed.

Speaking of informing the relevant parties, with the use of alerts, a reviewer can note important status change information in the asset management system and have the relevant stakeholders immediately alerted to the change without having to draft a correspondence. For instance, if a utilization report notes that an engine has been inducted into the shop or shows zero utilization, then alerts can be used to automatically inform the applicable technical team member, which in turn gives that person a head start in determining the status of the engine.

Analogous features can also be used to notify the reviewer when monthly utilization accruals on non-airframe components (e.g., engines, landing gear, APU) do not align with the airframe's accrual for the month. Notifying the reviewer of discrepancies between a given component's accrual compared to the airframe to which it is contractually associated can assist in determining the location of the component. These component accrual discrepancies can mean that the component has been removed for maintenance, but can also be indicative of when it is attached to a different airframe. Informing the reviewer and/or using alerts to notify the applicable Technical department stakeholders of these types of discrepancies enables them to get ahead of the game in determining the component's status and location. If not already noted on the utilization report itself, the relevant stakeholders can use this information to reach out to the operator to see if the component has been removed for maintenance or if it was attached to a different airframe.

Detective controls and integrity checks can also be used to identify abnormal utilization that can be difficult to catch by just eyeballing the report. Over time, historical trends of flight hour (FH) to flight cycle (FC) ratios can be leveraged to identify abnormalities in a utilization report. If the data entered has a statistically significant variance in the FH to FC ratio compared to historical trends, then detective controls can be used to alert the reviewer and/or relevant stakeholders that there may be an error in the utilization report provided.

Comparable checks can be used to inform the reviewer of what a component's Time Since New (TSN) and Cycles Since New (CSN) should be based on the accrual entered. This calculated TSN/CSN can then be compared to the TSN/CSN detailed in the utilization report. If the variance is beyond a material threshold the reviewer can then note this, immediately informing the relevant stakeholders of the discrepancy.

> The materiality threshold should be defined by the Technical department, but a reasonable threshold can commonly be a margin of five FHs and two FCs.

None of these alerts, detective controls, and integrity checks can eliminate the need for an eyeball review and validation of the data. However, they can eliminate manual re-entry of data by multiple parties, assist in diagnosing the cause of incongruities, and in recognizing outstanding issues without having to spend time performing exhaustive and redundant checks each month. Having more context made easily available improves the efficiency of validation reviews; thereby freeing up time for employees to move on to the next task.

LLP Disk Sheets

Engine maintenance is expensive. Spending $3 million on replacing an entire LLP stack too early just because there was not enough information available is not acceptable. Accurately tracking an engine status at the LLP level is essential to effectively managing a company's assets.

Inputting LLP disk sheet data represents one of the more intricate and involved data entry tasks that an aviation leasing company faces. An engine can have anywhere between 15 and 75 (depending on the inclusion of fan blades and/or annulus fillers) individual LLPs reported on a disk sheet. As listed below, each of these parts requires entry of several distinct data points on top of the high-level metadata for a disk sheet. These data points include:

- Disk sheet date;
- Disk sheet type or source (e.g., post shop, delivery);
- Engine TSN and CSN;
- LLP name (e.g., Booster Spool);
- Engine module (e.g., High Pressure Turbine (HPT);
- LLP part number (PN);
- LLP serial number (SN);
- LLP life limit;
- LLP FCs consumed; and
- LLP Cycles Remaining (CR).

Further complicating matters, given that certain engines can operate at different thrusts (which can also mean varying life limits per LLP), the last three data points may require entry for each applicable thrust level. All told, this can mean that over a hundred data points must be captured to enter a single disk sheet.

For instance, a CFM56-7B engine variant (which is the engine variant associated with globally popular Boeing 737 Next Generation aircraft) typically includes 18 individual LLPs. If operated at only a single thrust, then there could be 126 data points to capture not including the disk sheet metadata. If operated at two separate thrusts, however, that number can balloon to 180 data points (54 additional data points to capture the life limits, FCs consumed and CR for each additional thrust rating).

Given that LLPs can be one of the costliest maintenance expenses—replacing the entire LLP stack on a CFM56-7B variant would be in the $3 million range—it is essential to ensure the accuracy of the data entry.

Relying solely on one party to enter the data and perform eyeballed validations can be both inefficient and ineffective. So what can be done to mitigate the risk of false entry?

Potential Solutions

One method is the use of a double entry mechanism, which for these purposes can qualify as a form of integrity check.

A double entry mechanism is a process in which data for the same disk sheet must be entered twice and be consistent across both entries before being considered valid. With so many data points requiring input, it is easy for human error to occur during entry, but it is unlikely for the same error to occur by two different people.

Double entry mechanisms can identify any incongruities between the two entries, forcing both parties to come together to reconcile the cause of the mismatch and rectify the error before the disk sheet can be considered valid and finalized. While double entry can be time consuming, it represents one of the most fool-proof procedures for ensuring the accuracy of data entry and complying with a company's documented controls.

As with utilization reports, similar tools can be used to inform relevant stakeholders of major status changes and discrepancies resulting from the entry of a new disk sheet. One such tool, from a data entry perspective, is the use of calculated CR estimates derived from the engine's CSN, which can be used to cross-reference against the CR reported in the disk sheet. If a previous disk sheet on an engine already exists, then, in theory, the CR for the current disk sheet should equate to the CR from the previous disk sheet minus the delta of the current disk sheet's engine CSN and the historical ones. Alternatively, if no previous disk sheet exists, in theory, the CR should equate to the life limit minus the engine's CSN. By having calculated CR estimates available, the enterer can more easily identify potential discrepancies that require further investigation. These discrepancies can be an indication of an error in the actual disk sheet provided, the replacement of an LLP, a change in operating thrust, and/or an extension of an LLP's life limit compared to the last recorded disk sheet. Without a CR estimate, it can be nearly impossible to identify irregularities in the latest disk sheet—like finding a needle in a haystack.

Additionally, detective controls that compare the last recorded disk sheet against the current one being entered can assist in uncovering possible engine shop visits that were previously unknown. This can be of particular use with non-reserve payers that are not as forthright regarding an engine's status. This control would work by simply identifying LLPs that have a higher CR than previously recorded. If this scenario were to arise, the relevant stakeholders could be automatically alerted to the status change, thereby giving them a heads up to reach out to the operator to confirm the engine's status.

The alerts, detective controls, and integrity checks illustrated here (along with others not directly referenced) can come from several sources. Some may already be out-of-the-box features in your company's platform that only need to be enabled. Others may require the creation of workflow procedures and protocols. And others still may require the use of third party reporting tools (i.e., business intelligence). Whatever the case, the implementation of these tools can greatly reduce the energy spent on data entry and review, while maintaining a high degree of accuracy. It can also provide visibility of an important status change and any discrepancies in need of further investigation.

Looking forward, instead of performing data entry, why not go straight to the source? Developing integration solutions between a lessor's system and an airline or MROs maintenance planning system, may enable the requisite data to be shared instantaneously; thereby eliminating the need for duplicate entry.

Database Management

Data entry is needed to capture relevant information, but, no matter how efficiently and accurately it is entered, that data bears no fruit unless it is made accessible. Most aviation finance companies start out using spreadsheets to track their asset and contract information. As a company's fleet size grows, so does the number of transactions that must be managed. The larger the fleet size, the more difficult it is to track the asset and lease information solely through spreadsheets.

Relying on spreadsheets can also increase the risk of operational errors. If the wrong version of a spreadsheet is distributed or there is an error in a cell formula, then a company may under bill for maintenance reserves. The more transactions a team needs to process, the more error prone the process becomes. Accordingly, most company's eventually purchase a (transactional) asset management system that relies on an underlying relational database. Whatever the system, the data entered will be stored in one of these databases. How that database is managed and how the data within is extracted—either through the system's out-of-the-box reports or data analytics tools—is key for delivering effective management reporting.

Making the decision to purchase or even develop a customized asset management system is just the first step. There are still many pitfalls that can inhibit the full realization of a company's substantial investment in one of these systems. Well-defined business processes, and a clear understanding of where a new system fits in with those processes, is crucial to successful implementation.

Another important decision is: "Should a company load all of its historic data?" Other targeted decisions, such as a defined, consistent approach in naming conventions and input processes, all contribute to the quality of data records—enabling the ability to re-use and integrate the data with other systems across an organization.

It is essential that the chosen asset management platform can easily integrate with third party reporting and business intelligence (BI) tools. Given employees' competing priorities (i.e. primary responsibilities vs. implementation and optimization tasks), a project such as this may appear too daunting for an aviation finance company to tackle without a dedicated team that includes employees supplemented by outside resources.

An experienced implementation team can go a long way in avoiding the common pitfalls of this process and maximizing the technology investment. The effort involved in migrating data to an asset management technology should not dissuade a company from embarking on the journey.

The benefits can greatly outweigh this effort and can immediately pay dividends, including the continuous time saving benefits.

Data Extraction

One of the most frustrating obstacles that aviation leasing companies encounter is the inability to extract their data from multiple sources in a meaningful way. Many systems used in the aviation leasing industry today have built-in reporting features, but often times the system-generated reports do not sufficiently cover the requirements of the relevant stakeholders. BI solutions can be leveraged to get the data out, extend the bare-bones reporting capabilities of enterprise applications, and apply visualization and analytic capabilities to the underlying data. A BI solution can sometimes be as simple as using Excel templates that take pre-exiting reports to slice and dice the data, presenting the information in a more meaningful way. Excel templates can also be used to derive additional information not explicitly included in pre-existing reports.

However, there are also several BI platforms available that far exceed the capabilities of Excel. These BI solutions can be highly customizable to meet any company's requirements and are powerful tools in extracting data from a broad array of sources to consolidate it in a meaningful way, which can give a company a competitive edge.

BI solutions are ultimately dependent on the integrity of the raw data and data stores, but by maintaining clean data, the implementation of BI solutions can extract a company's data for boundless applications. BI solutions can empower innovative new ways of understanding data to reduce costs and maximize revenue and efficiency.

Looking Forward to "Big Data"

Despite seeming like there is an immeasurable quantity of data, currently, the relational databases used by most aviation leasing companies are modest in size. All in, these databases may only consist of a few hundred gigabytes of data, but with the rise of "big data" sources, aviation companies may be looking at whole new magnitude of data (i.e. petabytes).

> *"New technology aircraft can produce reams of data with applications that are filled with possibility."*

According to *Aviation Week & Space Technology*, the opportunity associated with a connected aircraft could be one of the most significant advancements in aviation's history. We are just beginning to understand all that can be done with 'big data' from aircraft. In fact, we are facing a plethora of possibilities for which the aircraft leasing community has not yet envisaged real-world applications.

One of those possibilities may be live access to an engine's LLP status, rendering that arduous and risky data entry task moot. The ultimate benefit may be live access to every component's status, so no more utilization reports. Think of the time that could be saved.

The use of "big data" is still in its beginning stages—within the aviation industry it is mostly limited to airlines and MROs. But as with any new technology, it is likely that leasing companies will one day have the capability to incorporate "big data" to maintain a competitive edge.

Analytics

There is inherent value in the optimization of the three steps in the data life cycle mentioned above, much of which should be self-evident. But ultimately some of the most significant benefits are how that data can be extrapolated and manipulated to perform advanced analytics. Whether for historical trend monitoring, maintenance projections and cash-flows, asset valuations and/or other analytics not contemplated here, any analysis is only as good as the underlying data and its accessibility. However, optimizing your data using the three steps above, unlocks a cornucopia of abilities in this all-important fourth and final phase of the data "life cycle."

Successfully capturing, inputting and storing this mountainous quantity of data enables your company to devise robust and nuanced analytical models. What follows are a few examples of how this data can be used, justifying the time and energy spent getting it to this point.

Historical Trend Monitoring

By continuously gathering and inputting high-quality data over time, this data can be used to derive historical trends, which can then be used for establishing baseline assumptions and predictive modeling. Reaching back to utilization reports, the information entered—in conjunction with the methods for managing databases—can subsequently be used to determine the average annual FH and FC utilization of an aircraft as well as the average FH to FC ratio.

Establishing a baseline assumption of the average FH and FC utilization for a specific aircraft or aircraft type is a quintessential component when performing maintenance forecasts and cash-flow projections. These vital data points are needed to estimate the time being burnt off a given component, to determine when the component will reach its limiting interval before requiring maintenance, and to project the monthly reserve accruals.

Without the use of historical trend monitoring, these utilization assumptions would rely solely on the insight and experience of the Technical department. While this insight is certainly valuable, it can also be difficult to validate as it may not be derived from a defined source that can be cited. Using trend monitoring to determine baseline utilization assumptions provides defined and repeatable procedures that can more easily be cited for any maintenance and cash-flow projections.

Historical utilization ratio trends can also be instrumental in refining appropriate reserve rates (particularly for engines) and determining LLP contractual build standards (CBS). Since engine reserve rates can be influenced by utilization ratios, it is useful to have utilization trend data by operator and/or aircraft type. This can enable both the Technical and Marketing departments to better understand the appropriate baseline rates to offer on an engine when negotiating with a prospective lessee.

Historical utilization ratios for an operator and/or aircraft type can also assist in deriving an acceptable LLP CBS. Utilization ratios can be used to calculate how many cycles remaining LLPs must have to last a full mean time between repair (MTBR) run on an engine when receiving a performance restoration (PR). This is crucial in mitigating the risk of an operator short-building an engine during a PR, causing it to re-enter the shop earlier than expected due to an LLP being exhausted.

Historical trend monitoring can assist in determining baseline interval and event cost assumptions, which can then be applied to maintenance forecasts and in determining baseline reserve rates. As with utilization trend monitoring, the tracking and monitoring of maintenance reserve claims, in conjunction with OEM supplied data, can be used to establish baseline intervals and event costs that can be traced back to a source. Having strong source data to back up intervals and event costs greatly improves the accuracy of any maintenance forecast and cash-flow projection.

In addition, whether by operator or aircraft type, the quotient of historical event costs divided by historical intervals supports baseline reserve rate estimates. Robust historical trends can help to make these rates reasonable to the customer while limiting any exposure risk from being under-reserved.

The applications of historical trend monitoring extend well beyond what is contemplated here. With well-defined protocols and procedures for both capturing and extracting data, there can be boundless useful information and insight gleaned through trend monitoring. Other such examples can include:

- Lag time between maintenance event dates and finalized claim reimbursement;
- Average shop visit downtime by component;
- Average transition costs by aircraft type;
- Tracking of operators that are continuously behind on payments;
- Average operating life of fleet before part-out;
- Changes to net book values (NBV) over time; and
- Spare engine pool trends and used (or sourced) LLP availability by engine type.

Maintenance Cash-Flow Forecasting

Maintenance cash-flow forecasting is one of the most nuanced uses of data, replete with innumerable considerations and caveats. Robust forecasting tools and procedures are also increasingly relied upon for financial reporting and obtaining a competitive edge.

A comprehensive and accurate maintenance forecast can empower a more strategic approach to portfolio management, provide an upper hand in contract negotiations, better determine maintenance liabilities, and ultimately result in higher revenue by optimizing end of life aircraft to avoid costly and unnecessary maintenance events. Yet, what goes into a forecast is often considered a black hole of data points and variables, making it a particularly difficult task to accomplish with a high degree of accuracy.

Setting aside the complex calculations and logic trees that comprise a maintenance forecast—a subject onto its own—understanding and extracting the requisite data points is the foundational step in producing a forecast. The baseline data inputs required in forecasting are often derived from multiple sources, spanning across several departments. These sources encompass:

- Current technical specifications and maintenance status including LLPs;
- Baseline assumptions or a knowledge base (e.g., event costs and intervals including LLPs, average utilization);
- **Contractual terms such as**:
- Lease terms;
- Reserve rates;
- Return conditions (RC);
- Rate escalations;
- Top-Up obligations;
- EOL compensation or Top-Up mechanisms;
- Unique lease provisions (e.g., reserve caps);
- Current reserve balances (as aligned to current technical status).

This can amount to well over 1,000 data points, coming from different locations that need to be extracted and parsed for relevancy. If a forecasting tool is not integrated with your company's databases, then those responsible for running forecasts likely need to manually retrieve these data points from their respective sources. This becomes another time-consuming and redundant data entry task that must be done before even getting to the primary purpose of running a forecast. Furthermore, with the quantity of requisite inputs, manual data entry in forecasting creates a high risk of human error.

Even seemingly small discrepancies or issues with the requisite data inputs can result in large inaccuracies in a forecast. For example, if the return conditions were entered incorrectly, then a forecast may miss an engine shop visit that is expected to occur. On a narrowbody, this could mean that a forecast is off by over $3 million. On a widebody that number can be closer to $10 million.

Forecasting tools or modules that are integrated with your company's databases (or asset management system) can reduce the need for redundant and risky manual data entry. By being integrated, the requisite data can be mapped directly from its respective source to the forecasting module—a substantially more efficient process. However, mapping the data comes with its own risks—especially if the underlying database for an asset management system is inconsistent in tying together the various sources. Poorly constructed relational databases can result in pertinent information being missed when being mapped to the forecasting module.

If the underlying relational database contains incongruities with its identification of a given component across the multiple sources, then important data related to that component will not be successfully mapped to the forecasting module.

So if an engine component in a technical status module is not correctly tied to the same engine where the current reserve balances are recorded, then the engine may map to the forecasting module with no opening reserve balance assigned to it.

A forecast's accuracy is also predicated on how current the technical status data is. If the most recent maintenance events on an aircraft were not successfully captured, then any forecast on the aircraft is inherently skewed. The missed events would likely become forecasted events occurring at a later date than in reality. This causes a trickle-down effect, skewing the rest of the forecast.

Outdated or stale technical data can also increase the burden of a forecast. If the most recent spec data is over a year old, then, despite being a historical timeframe, that year must be forecasted as well. Adding years to a forecast, especially historical ones, increases the likelihood of inaccuracies that can then permeate through the rest of the forecast.

> *Keeping up to date on utilization report entry is the best protection against having outdated information. The data entry tools previously noted can also go a long way in staying ahead of the game on any maintenance activity, thereby strengthening the baseline position of a forecast.*

The complexity of forecasting and the wide array of requisite variables puts a premium on having an integrated system with well-defined and constructed relational databases that contain the latest and most accurate data available. Such a system, combined with historical trend monitoring, allows those responsible for running forecasts to spend less time on data entry and validation of each baseline data point. Instead, forecasters can be more confident in the results of their forecast without requiring extensive manual manipulation to the inputs. This allows for quicker turnaround, especially when running fleetwide forecasts that are used for budget projections.

In addition, with less time spent entering and validating the baseline data, a forecaster can devote more time to "what if" scenarios. Knowing that the baseline data is sound, the relevant stakeholders can explore and determine the best solutions during lease negotiations and/or end of life planning. This could be identifying ideal term lengths to avoid costly maintenance events, determining the impact from rate changes or from switching a reserve payer to an EOL payer, and/or understanding the impact of waiving return conditions. Confidence in the baseline data means confidence in the results of those "what if" scenarios, which can give your company a competitive edge.

It should also be noted that there is an increasing expectation to track and monitor engines down to the modular level, which can significantly refine projected maintenance liabilities. Meeting this rising expectation, could lead to an influx of data requirements for lessors to accommodate, especially as it relates to maintenance cash-flow forecasting.

Capturing engine spec data down to the modular level may require a complete overhaul of a lessor's current approach to recording engine data—meaning engines will require a whole new series of data points that must be recorded with the ability to map to any forecasting module. This can entail a large-scale data entry project to input the modular level data. It may also require changes to the underlying relational database to accommodate this new data, while still associating it to the engine as a whole.

Current Asset Valuations

Current, up-to-date asset valuations are needed to understand the monetary value of a company's fleet and its maintenance liability. This is essential for an upcoming acquisition, large portfolio sale, change in accounting policies, and/or upcoming audits. Understanding the current asset value requires knowing the last major maintenance events and current spec status. Valuations are also predicated on event cost and interval assumptions. These, in conjunction with the spec status, are used to derive the monetary value consumed and remaining, as well as the green-time (time left before maintenance is needed) for each component.

As with maintenance forecasting, this requires having accurate and up-to-date technical specifications as well as having a strong rationale behind any event cost and interval assumptions. These can be bolstered by providing evidence from historical trend monitoring. Fleetwide valuations can be a massive undertaking, but having thorough and defined data management procedures can greatly improve the efficiency of its production and the efficacy of its results.

Handling the Challenges and Opportunities of Data Requirements

Throughout each stage of the data life cycle there are many challenges to overcome. Each of these challenges, however, comes with the opportunity to refine your business practices to match the efficiency needed with the efficacy desired.

From start to finish, Zeevo Group is prepared to assist you in facing these challenges. Along the way, we can help you uncover new, innovative ways to make your data one of the most reliable tools in your company's arsenal.

At the turn of the century, in a chapter titled "A Law of Acceleration," Henry Adams contemplates the consequences of a rapidly accelerating world. In essence, he posits that with each question answered, two new ones are raised. Enhancing our use of data today and the eventual implementation of "big data" will certainly answer many questions. But, which new ones will arise? This remains beyond a horizon that we are ceaselessly accelerating towards. Are you ready? Is your company ready?

IN BRIEF:

- **Inaccurate data is costly:** Missing or false data can result in millions of lost revenue and higher expenses.
- **Define procedures:** Well-defined (and documented) procedures improve the efficiency of capturing data and mitigates the risk of erroneous or missing information.
- **New technologies are changing the game:** Whether though records management functionality, web portals, automated checks, business intelligence products, or "big data" capabilities, modern technologies exist to capture and unleash the power of vast quantities of data.
- **Advanced analytics give companies a competitive edge:** Leveraging robust and quality data to create historical trends, produce accurate maintenance forecasts, and establish asset valuations can give a company a leg up in a competitive market.

GECAS targets expansion and ongoing filial status

GECAS is returning to net buyer status in 2018 after spending the past three years shedding more assets than it acquired.

The world's largest lessor by fleet size has been divesting about $4 billion-worth of assets each year during the past 36 months, while investing a similar amount. However, factor in depreciation, and the balance sheet has been gradually declining during this time but "only modestly by a few billion dollars", GECAS chief executive officer Alec Burger tells *Airfinance Journal* in an interview.

Now, the lessor is changing its focus and preparing to ramp up its asset purchases.

"This is the last year of selling more than originating. Over the next two to three years, the balance sheet is going to start growing after running at an elevated sales path where we were selling almost as much as were originating," says Burger.

This shift will see GECAS return to a "more normalised rate" of sales of a "couple of billion dollars-worth of transactions each year", he adds.

It plans on originating $5 billion to $6 billion in aircraft transactions, including sale-and-leaseback deals and aircraft from its order pipeline.

GECAS will also build its off-balance sheet portfolio through separate transactions, such as those through its newly announced $2 billion sidecar with Caisse de dépôt et placement du Québec, which was unveiled at the Paris air show.

Einn Volant Aircraft Leasing (EVAL) is subject to customary approvals and expected to close in the second part of the year. By 2020, Burger hopes EVAL will grow to $25 billion-worth of total assets.

He favours the "customer side" angle to the sidecar because it allows GECAS to ease its exposure limits.

"We have reached our concentration limits with many of our customers, so EVAL makes it possible to do a little more business with them," he adds.

Powerplant sidestep

EVAL will also allow GECAS to diversify its asset mix and move beyond GE-powered aircraft, which makes up a large proportion of its fleet.

"We will do a bit more non-GE product as part of the sidecar, but we haven't said how much that will be," adds Burger.

EVAL will also allow GECAS to expand its customer scope because of its low cost of capital.

"The cheaper funding will enable us to finance some really good credits or typically the slightly lower returning stuff. So, I view this as completely additive to our business," he says.

Alec Burger, chief executive officer, GECAS

To return to net buyer status, GECAS must focus on winning deals in an increasingly competitive environment.

"You saw that at the air show, this is a very competitive space. You show up for new campaigns, and 10 people are at the table on a good day. The competition is very stiff," says Burger.

However, that type of business is not the kind GECAS is looking to grow. "You won't see us competing with sale and leasebacks in China. That is not somewhere where we need to be competing for deals."

Instead, GECAS will continue to "gain traction" by working with GE on joint campaigns with GE Aviation. "We have a deep domain and a linkage to GE Aviation. That works for us, to use our in-house capability to look for and win new transactions."

GE Aviation reported a 3% uptick in commercial engine

Source: Boeing

orders during the quarter because of LEAP and GEnx sales, partially offset by lower GE90 and CF6 orders. It reported $1.7 billion of new commercial engine orders, including $932 million for LEAP, $206 million for CF34, $138 million for GE90 and $166 million of GEnx orders. CFM orders were also up 13% to $186 million.

GECAS, meanwhile, reported a 3% dip in total assets for the three months to 30 June, compared with the year-earlier period.

The Norwalk, Connecticut-based lessor had second-quarter total assets of $39 billion.

Net earnings at the lessor improved 1% to $369 million compared with the second quarter of 2016.

General Electric, its parent company, has not broken down revenue figures for GECAS since it announced plans to leave the financial sector through the sale of certain GE Capital assets in 2015.

Burger insists the return to modest growth is "a really big deal". He says: "As part of an employee-engagement perspective, being part of something that is shrinking is not energising, but now we are changing that. If you look at our expected activity on a depreciation run rate, we will be building the balance sheet to the tune of a billion a year over the next two to three years, and that is on-balance sheet.

At the same time, we are building the off-balance sheet, so that is a big sign of confidence from our parent regarding growing our business."

This nod of encouragement from GE is a welcome sign during a period of change at the corporate level.

GE reported a 45% drop in earnings per share for the second quarter of the year, in its last set of results before Jeff Immelt, chief executive officer (CEO) for almost 16 years, stepped down.

John Flannery, the former president and chief executive of GE Healthcare, replaced Immelt as CEO on 1 August.

Flannery is said to be considering a variety of options for GE, which has lagged behind its peers in share price and cashflow performance in recent years.

Though Flannery's plans for GE are uncertain, Burger maintains that GECAS' positioning within the GE family is sound.

"GECAS is a great GE business, not a great business, but a great GE business. We have had incredibly consistent returns, earnings, this ability to withstand cycles and then we have this industry that we all agree is growing and that is extremely global," he says.

The potential loss of human capital, though, does concern him.

"There is no more economic capital than human capital, and this is not specific to aviation. I saw this in real estate; there is a continued fight for the right people. That is one of the things that worry me," says Burger, who adds: "When it comes to people, it pays to be paranoid. I feel really proud that the turnover has been extremely low at GECAS, but I want to keep it that way."

GECAS finds extra gear with new sidecar

GECAS' decision to unveil a $2 billion sidecar vehicle on the first day of the Paris air show was a curious move: Air shows are traditionally used by lessors to unveil equipment orders, not financial arrangements with Canadian pension fund managers.

But like the show's order announcements, GECAS' sidecar with Caisse de dépôt et placement du Québec (CDPQ) was a long time in the making.

Sources indicate its final shortlist included three parties: a sovereign wealth fund, an insurance company and CDPQ.

GECAS had originally sought $500 million in equity to supplement $1.5 billion of debt it would source in the marketplace. However, CDPQ won the tender by offering to fund 90% of the debt and equity of the $2 billion transaction, thus removing any need for third-party help.

No doubt the vehicle ticks several boxes for GECAS, making it more competitive in a space crowded with new investors.

First, it allows GECAS to diversify its funding sources with low-cost capital. The aircraft-leasing sector continues to attract investors on the hunt 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.

As part of the deal, CDPQ will provide money over four years to create an aircraft leasing and financing platform, Einn Volant Aircraft Leasing, EVAL, alongside GECAS. The pension fund indicates the $2 billion in funding could increase over time.

Of course, GECAS can access cash via its parent company and GE Treasury, but the lessor is prudent to diversify its sources. Memories are still fresh of the falling out between American International Group and International Lease Finance (ILF) during the 2008 financial crisis. Relationships with parent companies can change and additional pockets of cash could help mitigate any funding shifts.

Also, with a new GE chief recently appointed, and more changes on the cards, the vehicle gives GECAS funding certainty. John Flannery, who took over from Jeff Immelt on 1 August, is said to be considering a variety of options for GE, which has lagged behind its peers in share price and cashflow performance in recent years. With Flannery's plans for GE uncertain, GECAS is wise to secure additional capital to avoid a potential battle with other GE businesses for shared internal funding lines.

Backed by low-cost capital, EVAL also allows GECAS to better compete in the cut-throat sale-and-leaseback market alongside the placement of its new aircraft order positions.

A banking source notes that return expectations on the sidecar are likely to be "much lower" than GECAS' own return requirements, allowing the lessor to "compete with other lessors on tier-one airline names".

GECAS says EVAL enables it to "grow and overcome credit concentrations" because the lessor will not be funding on its own balance sheet.

"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," adds the lessor.

Indeed, the sidecar must have provided GECAS with the confidence to top up its orderbook at the 2017 Paris air show, after years of what its chief executive officer, Alec Burger, has called "elevated sales".

The lessor secured commitments for 100 Airbus A320neos, equipped with CFM engines, due to be delivered from 2020 to 2024.

It also unveiled plans to convert 20 of its current Boeing 737 Max 8 orders to the larger 10 variant. GECAS has orders for 170 Max aircraft and is the largest customer among lessors for the type.

In the past two years, GECAS has sold about $8 billion-worth of aircraft, even as rivals have significantly expanded their operations. These sales have included portfolio deals with Aviation Capital Group, Goshawk, China Construction Bank Leasing and, more recently, Avolon. That deal involved the $2 billion disposal of 45 units to the HNA-owned lessor.

Finally, the sidecar allows GECAS to rack up additional income by acting as a servicer for the new leasing platform.

"It's a perfect deal for GECAS," says a source commenting on the transaction. "Pension funds are searching for long-term stable income and, as aviation leasing matures, it is being viewed as quasi-infrastructure."

The deal marks the first aviation investment for CDPQ, an institutional investor which manages several public and para-public pension plans and insurance programmes in Québec.

A banking source notes that aviation leasing offers pension funds unlevered returns of 6.5% to 8%.

GECAS echoes this view of pension funds as natural aviation investors, noting that the $2 billion platform allows CDPQ to "target attractive aircraft leasing returns" in a post-crisis environment dominated by soft yields.

A lessor source points out that GECAS' return-on-equity ratios are likely to improve with the sidecar "all the while using other people's money, so what could make for a better deal?"

Rolls-Royce targets lessors

Rolls-Royce is further adapting its aftermarket service with newly launched LessorCare targeting a growing market: operating lessors.

The UK-based engine manufacturer introduced LessorCare to the leasing community in January 2017 as part of its wide range of services.

Rolls-Royce has pioneered the aftermarket service for commercial aircraft fleets. It launched TotalCare in 1994 and has since introduced more products for its airline customers.

But over the years, it has been criticised by lessors for its grip in the aftermarket business. By directly collecting the maintenance reserves from airlines, TotalCare has limited operating lessors' control over their exposure to the potential workscope of the engine maintenance.

Moreover, operating lessors need flexibility as they move aircraft and engines between customers.

The manufacturer recognises the importance of the lessor community and describes its latest product as a "simple and flexible service offering".

"The world according to aircraft lessors is a rapidly improving space. Most of what lessors need from us is really incredibly straightforward," says Simon Goodson, senior vice-president lessors, civil aerospace, Rolls-Royce.

Goodson says the concept was launched at ISTAT Europe conference in 2015. "More recently, our thinking of all of this space has come under the concept of LessorCare," he adds.

"Why are we doing this? We have spent time with our customers and it is a very simple equation: they are looking for the maintenance life that has been consumed from engines to be there in cash at the right time accessible for them," says Goodson.

Lessors are also looking at the other half of that investment, life yet to be consumed and that can be easily monetisable, he adds.

"We have worked out that the multiple interaction between leasing customers and Rolls-Royce just takes longer than it should. LessorCare is now bringing together that in one simple place," he claims.

Under LessorCare, the engine manufacturer establishes a simple single agreement covering all engine types dramatically reducing the time it takes to contract this with lessors. If we then incorporate the work it has been doing on aircraft transitions and Operating Lessor Engine Restoration Agreements (OPERA), as well as features around asset management, "It makes us much more responsive and ultimately enhances the customer experience dealing with Rolls-Royce," he adds.

Goodson says the main idea behind LessorCare is one of simplicity with no loss of flexibility.

"What we are doing is drawing together a range of services under one, simple, agreement covering all Rolls-Royce Trent engine types. This agreement will cover all the services they require, and through that simplification we are looking to streamline the administration that goes into leasing services."

Simon Goodson, senior vice-president lessors, civil aerospace, Rolls-Royce

Within LessorCare there are three main elements in the product agreement:

1. Customer support – providing lessors with access to Rolls-Royce's network of technical support, publications and training to optimise responsiveness and keep aircraft earning revenue.
2. Transitions services – giving lessors access to a range of maintenance and availability services, including return condition management, remarketing support and maintenance value portability to ensure aircraft move faster and more efficiently between leases. The services include return condition management, remarketing support and maintenance value portability; all about getting aircraft back into service faster and more efficiently.
3. Asset management – maximising engine values through their life cycle. This includes the incorporation of enhancements to OPERA within LessorCare.

Goodson says the goal of the asset management piece is to provide confidence, allowing the asset to be held for longer.

He is confident that asset management will include a variety of different engine exchanges and greentime leasing solutions.

"We know that at the mature end of the market there will be a requirement for us to have engines that support the TotalCare commitments, to have engines to support TotalCare and TotalCare Flex commitments.

Likewise, depending on the lease solution, the lessor may require some engines.

"Ultimately, it is about achieving the residual value of its investment, monetising it. Lessors want the confidence of what is invested has a liquid market attached to it. Liquidity is a critical piece when dealing with high value assets," he adds.

Goodson admits there has been the perception that residual values of Trent-powered aircraft might not be as good as General Electric- or Pratt & Whitney-powered aircraft.

"What we have done is to make sure we can drive confidence in liquidity. There will be a liquid market of these aircraft as they mature. Our mission with asset management is to make sure that, as the asset matures, the lessor is going to monetise its investment. It is an absolute certainty because this is how they make their returns."

The OPERA scheme is designed to return the lessor to a fully funded position. It provides a fixed price overhaul for the next performance restoration, ensuring a price certainty that the lessor can plan against as the engine returns. The scheme has been popular. It had 14 customers in 2012 and now has 30 major lessors accounting for 400 engines.

Critics of the scheme point out that while it does address some of the problems surrounding contracts, it does not get around many of the fundamental issues bothering lessors: not least the fact that despite better contracts, return conditions clauses and the OPERA scheme, lessors still do not collect the respective maintenance reserves.

"We have been doing a lot of work with OPERA, that mechanism that moves the value around the system. We expect within the asset management piece to launch an enhanced version of OPERA that allows earlier cash out for maturing aircraft. By doing this, we will give confidence that liquidity will be here, and confidence that they can hold that investment for longer, which is a critical piece in all of this," says Goodson.

LessorCare vision

Rolls-Royce is working with AerCap to develop and introduce LessorCare in the second half of 2017.

"We have AerCap working with us – a key lessor to help us refine this offering with a view to rolling it out to the wider lessor community later this year," says Goodson.

Rolls-Royce expects LessorCare will be available eventually for all of its lessor customers.

"However, as is clear from the amount of positive feedback that we have received from our customers, LessorCare will be extremely popular so we will have to focus our efforts initially on our larger customers," he adds.

Goodson recognises that the operating leasing industry is a "big force" and lessors are getting larger.

In 2005, lessors represented about 16% of the total commercial fleet installed base; today, it is more than one-third. By the time the current orderbook delivers, in the second half of the next decade, operating lessors will represent about half the commercial fleet installed base.

"As lessors get very large, we have a need to constantly evolve. The future vision for LessorCare could potentially include the provision of our services via the lessors," he says. Goodson sees Rolls-Royce potentially contracting its services with the large leasing entities. "The advantages for us is that lessors would then go distribute commercially the services to a wide number of airlines, operating only few aircraft. "That could potentially be where the LessorCare goes," he adds.

Lessors cover a whole spectrum of financiers, all the way from very large market forces such as AerCap to single entities. Therefore, there is a huge variety of capability.

"What we know is our business model transition is key to our business and their business model key to them realising the residual value of the investment they invested in. So we give them a help in their remarketing exercise from the outset and access pre-agreed to the many service lines we have," says Goodson.

All eyes on the E2

John Slattery, Embraer's chief executive officer, talks about service entry of the Embraer E190-E2, his hopes for the programme and why Embraer puts lessor interests before its own.

Original equipment manufacturers (OEMs) have a good reason to be slightly worried right now. After several years of steady growth, there has been some turbulence in the market, with a global slump in orders and a deceleration in traffic growth. Yet, despite these obstacles facing the industry, the chief executive officer of Embraer has a rather positive outlook of the market.

"We're going through a patch of calm air with a reasonable tailwind," John Slattery tells *Airfinance Journal*, "and that's why my expectation is that we will continue to see more new orders being announced throughout the balance of this year and my hope is that that includes orders from existing customers and new operators."

At the 2017 Paris air show in June, the Brazilian manufacturer booked orders for 18 aircraft worth about $1 billion at list prices. Customers included Belarusian Belavia Airlines, Japan's JAL and Fuji Dream Airlines, and KLM Citihopper. This made Paris 2017 a slightly stronger air show than Farnborough 2016, at which Embraer booked 16 orders.

Like other OEMs, some of the headwinds for Embraer include geopolitical risks and global pilot availability, but Slattery says that the Brazilian OEM is experiencing strong momentum, and benefiting from a longer pipeline of lessor engagement opportunities than he has seen in the past few years.

"I'm definitely sharing a target with my colleagues to bring new network flag carriers into the operator base of the E-Jets. So I'm very focused on that and I hope we can achieve that goal over the balance of this year and into next year. I would say that the mood at Embraer is very strong and upbeat. It's confident, but not in an arrogant way," he adds.

One reason for this optimism is that Embraer is now within a year of entry into service of the E190-E2.

"The customers have confidence that we're on time; they have confidence in the technical spec of the aircraft. In fact, it is slightly ahead of what was originally scheduled and we're under budget, so our shareholder base is pleased," says Slattery.

"We're now seeing a level of interest right across the world with airline CEOs and their leadership that I have not witnessed in three years," he adds.

Over the next 20 years Embraer expects 6,400 aircraft in the 70- to 130-seat range to be delivered around the world. Half of that number will go to western Europe and to North American markets, according to Slattery.

So far, Embraer has enjoyed most of its success in these markets, working with carriers including Air France, KLM, Lufthansa, British Airways, Alitalia, LOT Polish Airlines, American Airlines, Delta Air Lines, United Airlines, Jetblue Airways and Alaska Airlines.


John Slattery, chief executive officer, Embraer

But Slattery identifies south-east Asia and China as the "standout" area of growth since "27% of our market will come from that region over the course of the next 20 years".

He adds: "My key focus now is to broaden Embraer's footprint in south-east Asia."

The chief executive also believes that the arrival of the geared turbofan (GTF) engine on the E2 family will bring a "second wave" of opportunities to place aircraft in the Middle East.

There are about 80 Embraer aircraft active with Middle East carriers, according to *Airfinance Journal's* Fleet Tracker.

Asked how the Middle East's appetite for widebodies could impact regional demand, Slattery says: "The thing about widebodies is that you have to feed them. In a lot of these big hubs, at least a third of the aircraft that are flying there, maybe more, are regional aircraft to feed the larger widebodies.

"As the Middle East orders more widebodies, in my opinion, they're going to need more and more smaller aircraft to feed those mega-hubs that they have in the region."

Slattery believes the GTF-powered E2 is a good candidate to meet that need, because it is designed to cope with "hot, high and harsh conditions".

He adds: "My expectation is that, with the capability of the E2 and the E1 in terms of range and increased seating, coupled with the capabilities of the GTF engine, we will have a second wave of opportunities in the Middle East." Although many customers are still ordering E1s rather than turning their attention to the E2, Slattery appears unconcerned.

"If it's an E1 solution – and I expect more E1 orders this year – then that's fine. If it's an E2 solution they're looking for, then that's fine.

"This year I expect we'll continue to have more E1 orders but as we came to the end of this year and into next year, there's no doubt about it, the focus will be on the E2.

"I expect a lot of activity around the E2 but I also expect that we're going to be selling E1s for many years to come."

Waiting game with lessors

Although Slattery expects to concentrate on the E2 programme next year, he will not accept any more orders from lessors for the type until they have placed "a reasonable percentage" of the aircraft.

Three lessors – AerCap, Aircastle and ICBC Leasing – have orders for 50, 25 and 10 E2 aircraft, respectively, according to Fleet Tracker.

"I would not entertain any more lessor orders until a reasonable percentage of the aircraft from those three lessors in aggregate have been placed. That's my commitment to the marketplace."

He adds: "It's not a contractual commitment; we just believe it's the right thing to do. Those lessors now are partners with Embraer and we will not abuse partnerships in any shape or form. We're working with them and not only that, we put the interests of our lessor partners before ours." Slattery also mentions Nordic Aviation Capital's outstanding order for 24 E1s, before adding that Embraer "has a slightly different philosophy" to other OEMs in that it wants initially to limit the number of lessors buying a new aircraft type, and instead focus on a few "key leasing partners" the company can work closely with.

E2's challenges

But even with the promise of the E2, new aircraft programmes rarely come to market without some early teething problems.

The only confirmed lessor placements of E2s have come from Aircastle, which has placed three E195-E2 aircraft with Brazilian carrier Azul Linhas Aereas, and from AerCap, which has placed three E190-E2s and two E195-E2s with Turkish carrier Borajet as well as five E190-E2s with Air Astana.

Slattery refuses to say much more about lessors placing the E2 aircraft, citing a need to respect confidentiality, especially as many of them are public companies. He points out, though, that Aengus Kelly, AerCap's chief executive officer, has appeared very confident in the lessor's quarterly earnings about the placement of E2s.

However, Borajet, currently AerCap's only customer for the E2s, suspended operations in April, citing maintenance issues. Some of the carrier's aircraft had to be repossessed. Although the airline wants to relaunch next year after a restructuring, it is uncertain whether it will take the E2 aircraft, plus it looks unlikely to be an attractive leasing partner, having narrowly avoided administration.

The lack of airlines choosing to lease the aircraft is not the only obstacle facing the E2. The US, the leading market for Embraer aircraft, has thrown up some issues for the E175-E2, which fails to meet pilot scope clause criteria.

The only firm orders for the aircraft type in the region are from US company Skywest Airlines Inc., which has a 100-unit backlog. However, because the E175-E2 exceeds the maximum weight limit for regional aircraft under the scope clause, it is now prohibited from operating in the US. In response, Embraer has delayed delivery of the aircraft from 2020 to 2021.

But Slattery remains optimistic about the clauses.

"We expect, over the course of the next number of years, that management will have these meaningful discussions with their pilot unions," he says. "Scott Kirby, the president of United Airlines went public a couple of weeks ago saying that he wants to have that discussion with the pilot unions. There are broad discussions around scope clause; that's the conversation between the management teams and the unions."

He adds that Embraer still "has a solution" for the customer today and is able to sell the scope-compliant E175-E1, if the talks do not progress.

Regional consolidation

Another aspect of the regional market that Slattery has to consider is lessor consolidation and the growing domination of Nordic Aviation Capital (NAC) in the regional space. Last year the company acquired two Embraer-focused lessors – Aldus Aviation and Jetscape – in the space of a few months. NAC now has a fleet of 138 Embraers, making up nearly one-quarter of all leased Embraer aircraft, according to Fleet Tracker. Other significant players in the market include Avolon, CDB Leasing, Falko and GECAS.

Slattery, however, is not concerned. "NAC is already one of the most formidable lessors in the regional space, both on the turboprop and on the regional jet side, and I can tell you from my perspective that they're already proving themselves to be a formidable partner, somebody that I engage with a lot, I trust a lot and I look for their support a lot."

But he does recognise that monopolies in this industry are best avoided. "I don't think Martin Møller and his team expect to have a monopoly on the E1 or the E2," he says. "GECAS continues to be a large lessor; BOC Aviation – Robert Martin and his team – still have aircraft. The leasing business is a trading business, don't forget that, so lessors will trade aircraft. I'm sure Martin [Møller] will end up trading some aircraft at some time; it's just a good discipline."

Lessor engagement

Each year Embraer holds leasing events in Dublin. Slattery says Embraer is hosting more of these events because many E1s are coming off lease.

"We are working with our lessors to make sure we are competitive in cost and in lead time to make sure we get aircraft turned around quickly and get them prepared for those second leases. Constantly aligning our interests with the lessor's interest is important to maintain long-term residual values."

Although Slattery has a bullish short-term outlook when it comes to aircraft sales, he is wise to ensure his team continues to work with lessors so that Embraer can withstand any turbulence ahead.

How to take advantage of new tax reforms

The recent passing of a bill to reduce the tax rate for aircraft lessors domiciled in Hong Kong has spurred more lessors to consider establishing operations in the city. Michael Allen looks at how they can take advantage of the new legislation.

Lessors based in Hong Kong may soon be paying as little as 1.65% in tax

On 28 June 2017, Hong Kong's legislature passed an unprecedented bill that promises to transform the city into an aircraft-leasing hub by reducing the effective profit tax rate to just 1.65%.

Few spectators joined *Airfinance Journal* in gracing the Legislative Council's public gallery – the debate about the bill lasted a gruelling 12 hours over three non-consecutive days – but leasing companies in Hong Kong, China and around the world were eagerly awaiting news of the bill's passing.

Clarence Leung, director, tax services, at PwC Hong Kong, says that now the bill has become law – having been gazetted on 7 July 2017 – companies should "start to look at it now and formulate a plan in terms of whether Hong Kong is going to be a stable jurisdiction in relation to their business plan".

He cautions, however, that lessors seeking "treaty shopping" should not come to Hong Kong.

"When we were doing the marketing, one point the IRD [Internal Revenue Department] wanted to point out is you


Clarence Leung, PWC

shouldn't use it as a tax-minimisation vehicle," he says.

In addition, lessors looking to enjoy the benefits of the bill should be those intending to conduct a good amount of business in Hong Kong.

"If you do one aircraft only it is not worth coming to Hong Kong because it is a bit expensive," he says, adding that the cost of setting up in Hong Kong should be weighed against your intended business there.

Some early birds are setting out to catch the worm: Avolon, which established a Hong Kong presence last year, says it may take delivery of some new aircraft under Hong Kong ownership in the future.

"The headline tax rate is clearly a significant step forward; however, the relatively narrower tax treaty network in Hong Kong versus Ireland still makes it more restrictive. As lessors begin to consider locating aircraft ownership in regional hubs, Hong Kong has clearly taken a significant step in its relative benefits," Andy Cronin, chief financial officer of Avolon, tells *Airfinance Journal*.

ORIX set up its office in Hong Kong in December 2016. Chief executive officer David Power, who declines to comment specifically on his company's plan to take advantage of the new bill, tells *Airfinance Journal* only that ORIX opened the office "to be closer to one of our key markets and for better access and communications with our investors and shareholder".

Causeway Bay-based Century City, which has a portfolio of 15 aircraft, says that the passing of the bill is a "good start to try attracting lessors and managers to set up their base in Hong Kong".

Kenneth Szeto, executive officer, chairman's office, says: "Hopefully, the practice notes will come out soon to give more detailed guidance to the lessors, managers and other interested parties. I believe they want to ensure that they will be qualified to enjoy the concessionary tax benefits with their setup."

He adds that Century City is "having some internal discussion on this topic", but has no "definite plan" yet.

CALC has been perhaps the most outspoken about its intentions in Hong Kong, although the lessor has long had a presence there and is not a new entrant to the city. The company's chief executive officer, Mike Poon, said in a statement marking the bill's passing that, as a result, CALC could add Hong Kong to its existing Dublin, Tianjin and Shanghai platforms.

Speaking to *Airfinance Journal* at the Paris air show in June, Poon said: "I trust in one or two years' time Hong Kong will be a very attractive place for global lessors. Once the changes have been implemented, we will move some aircraft under Hong Kong law. Definitely. We are the market first mover in Hong Kong and we will keep pushing this until it happens."

Mainland lessors

Chinese mainland companies are widely considered to be eyeing the bill with interest and considering establishing a presence in Hong Kong. Because of their geographical proximity – among other things – they could be some of the first movers.

Yao Zhou, counsel at Rui Bai Law Firm, has been advising mainland clients on the advantages of setting up a leasing platform in Hong Kong. She says that before Hong Kong's legislature passed the bill, "everything was still uncertain and up in the air" and Chinese lessors were only doing analysis. However, now that the bill has become official, they are more seriously looking at establishing a company in Hong Kong.

In June, Ryan Guo, the managing director of Zhongyuan Aviation Leasing, told *Airfinance Journal* that his company was considering a move to Hong Kong from Zhengzhou, Henan province. Its base in Zhengzhou – a tier-two Chinese city about 700km from Beijing and nearly 1,000km from Shanghai – makes it hard to attract aircraft leasing talent, he said, adding: "So we will plan to move to Hong Kong because Hong Kong has got the tax reforms."

A source at Minsheng Financial Leasing also tells *Airfinance Journal* that it plans to set up a presence in Hong Kong now that the bill has been passed. *Airfinance Journal* understands that Ping An Leasing established an entity in Hong Kong in 2016.

"We don't have any deals in the Hong Kong platform yet, while we may have the possibility to put aircraft in Hong Kong in the future. It's hard to tell now," says a Ping An source.

From a People's Republic of China (PRC) law perspective, PRC-Hong Kong outbound investment involves Hong Kong being treated as a foreign jurisdiction, says Zhou. In this way, PRC-Hong Kong investment is governed by the same rules as, for example, PRC-UK or PRC-Canada investment.

Companies need to seek several governmental approvals to make the investment, including from the National Development Reform Commission (NDRC), State Administration of Foreign Exchange (Safe) and Ministry of Finance (Mofcom).

China has recently tightened control on overseas investments. In December 2016, Beijing took measures to stem capital flight as the country's exchange reserves

Several lessors including CALC, CDB Leasing and Orix have offices in Hong Kong

continued to fall. The Financial Times reported in January that the central bank's foreign exchange reserves for the previous month fell by $41 billion to $3.01 trillion.

However, Zhou does not believe these increased restrictions are likely to impact negatively aircraft lessors looking to set up in Hong Kong.

"They [the Chinese government] are concerned with outbound real estate investment. Also, they impose particularly rigid requirements on investment or merger and acquisition projects. In terms of setting up a vehicle company by a leasing company, I don't think they will suffer from the tightening by the government.

"The PRC government authorities have already streamlined their approval process and we see the tendency that if the amount is not high, then a filing requirement is imposed rather than a prior approval requirement. The process is relatively straightforward compared to what it looked like, say, two or three years ago."

Zhou is referring to new regulations unveiled last year stating that companies would no longer be required to apply for NDRC approval for mid- to long-term debt; rather, they can register certain information with the NDRC before incurring a foreign debt.

Tejaswi Nimmagadda, a counsel at King & Wood Mallesons Hong Kong, agrees that increased restrictions on outbound investment could, in theory, be an issue. He says that the Chinese government is experiencing a tension between its "long-term goals and the short-term desire to stop capital outflow".

However, he adds that Chinese lessors setting up in Hong Kong could help reduce overall capital outflow from China.

"Funding a deal really means paying the capital cost of getting the aircraft, which is really a capital transfer overseas to Airbus and Boeing," he says.

He provides the example of a US leasing company that becomes attracted by Hong Kong's new tax bill and sets up in the city. If the US company, rather than a domestic Chinese lessor, leases to a Chinese airline, then the total amount of money leaving China is less, because the foreign company is making the investment in the aircraft via the sale and leaseback, while the Chinese company is only paying in instalments and the US company still retains a significant chunk of equity in the aircraft.

"So that amount of money going out of China is less – and spread out over a longer period of time," says Nimmagadda.

He also believes that Hong Kong's new tax reform bill could increase non-Chinese lessors' leasing into China – a trend that has dropped in recent years because of the decline in the renminbi and Chinese airlines' preference for financing in renminbi, as well as the legal uncertainty of being able to regain title over aircraft that come off lease and need to be transferred to another jurisdiction.

Speed of setting up

Priscilla Law, head of financial services at InvestHK, a department of the Hong Kong government that promotes foreign direct investment, says that setting up a company in Hong Kong can be done "very quickly" and the steps to achieve that are "fairly straightforward".

She says: "Incorporating the company will only take a few days to a week. The company should also engage some tax experts in looking at the kind of lease or activities they will be doing in Hong Kong. The tax issue is very important for aircraft lessors. They will have to have someone who has the expertise to do an overall analysis of their existing activities and see if they can take advantage of the tax relief."

Law adds that InvestHK has already helped CDB Aviation to set up its Hong Kong office, and expects more lessors to follow. In the "initial stage" after the passing of the bill, she expects mainland leasing companies to set up a presence in Hong Kong.

"They will be very keen to set up an office, but over time I think the Middle East, US and European lessors will also be very interested, not just because we are part of China and because of the proximity to that market for aircraft leasing, but also that we are an international financial centre.

"We hope these companies will set up their offices here soon, but it's hard to say an exact timeline. Probably before the end of the year we may have at least one or two Chinese or maybe non-Chinese companies as well."

PwC's Leung says it should not be underestimated how keen western lessors are to use the Hong Kong platform to lease into China.

"The forecast in terms of the new aircraft to be delivered into China is significant compared to other countries, so a large part of that will be financed by the western lessors. While I believe the Chinese lessors will be very interested, I would not underestimate the speed of western lessors to come to Hong Kong or use Hong Kong to lease into China," he says.

Justin Sun, a partner at Holman Fenwick Willan in Hong Kong, says that, although Chinese companies will no doubt be attracted by these rules, it is not the only reason why they are looking to set up in Hong Kong.

"Because of the attractiveness of the new tax rule, people will start to book their aircraft from Hong Kong, though personally I don't think that will happen immediately. The lawyers and accountants need to get a clear idea of how it works, particularly if it is a big institutional client and investor," says Sun.

"I think there will be some time gap between now and when the first proper qualified lessor is set up. Whether you will see Irish lessors rushing to start to transfer part of their business to Hong Kong, my personal view is it might happen a bit later. My gut feeling is PRC lessors may start to do it in the first batch because they are close to home and it makes more sense given their own customer base."

Not just lessors – airlines, too

It is not just operating lessors which can take advantage of the tax reforms: airlines with captive leasing arms are also considering setting up in Hong Kong. *Airfinance Journal* understands that China Eastern Airlines' leasing arm, CES Financial Leasing, is studying a plan to do so.

"Some people say it might be difficult to get funding for those second-tier airlines. In Hong Kong, we have many different banks here. They should explore in relation to where they should actually use Hong Kong to lease," says Clarence Leung, director, tax services, at PwC Hong Kong.

"I know that a lot of airlines are looking at it, but I think they are slower than the leasing companies. I would encourage them to take proper advice… As far as I know the airlines don't like to rely on one source of financing. Sometimes they will go to different banks, even if it's got a worse margin for them. You never know when the bank will close the tap. That's why you need to keep the different financing channels."

Hong Kong's leveraged lease losses

The demise of the Hong Kong leveraged lease (HKLL) has been a key reason why the territory has not developed as an aircraft financing and leasing centre since 1992, say sources.

Johnny Lau, now chief executive officer of advisory and consultancy firm Astro Aircraft Leasing, joined Cathay Pacific in summer 1989. It was there, after a transfer from the salaries department to the aircraft finance department, that he had his first encounter with the HKLL, a tax structure popular in Hong Kong at that time.

The HKLL involved a Hong Kong partnership acting as lessee to an airline, permitting steep depreciation allowances to the Hong Kong partnership, in which the equity investor was the majority partner. The structure permitted an initial depreciation allowance of 60% in the first year and an annual depreciation allowance of 30% at the end of the first year and in each subsequent year on the reducing value.

Johnny Lau, CEO, Astro Aircraft Leasing

Such generous depreciation allowances created substantial losses to the Hong Kong partnership in the first three years of the lease. These losses would then be utilised by the equity investor in accordance with its shareholdings in the partnership to set off against its taxable profits from other businesses. The tax benefits generated would be shared by the airline.

When a HKLL is dipped into another country's tax lease, this is referred to as a "double dip". One example is Japanese leveraged leases dipped into Hong Kong leveraged leases, whereby the Japanese lessor took legal ownership of the aircraft and leased the aircraft (with a purchase option) to an airline. A Hong Kong partnership then made a hire purchase (with purchase option) from the airline and took economic ownership of the aircraft, then leased it back to the airline.

This structure was not too common, however, because it would have to be hidden from Japan's tax authorities and so was high risk, therefore other tax lease jurisdictions – such as Sweden – saw more double dips with Hong Kong leveraged leases.

By the time Lau joined Cathay, the airline had already closed 12 such transactions, naming each one after the number it corresponded to.

However, since the number 13 is considered unlucky in the West and the number 14 unlucky in Chinese culture – because of the Chinese word for "four" sounding similar to that for "death" – Cathay decided to call these transactions HOO Limited Partnership and HOP Limited Partnership instead.

He recalls two aircraft – 747-400s with tail numbers HOO and HOP – that were dipped into Swedish leases, providing efficient financing for the Hong Kong flag carrier.

"When I started at Cathay, Hong Kong was the centre of aircraft leasing in Asia, and Singapore was only a fringe," he tells *Airfinance Journal*.

But the tax-deferral arrangement available with the HKLL meant Hong Kong suffered tax losses, without any compensatory macroeconomic benefit. Consequently, the government took the view in 1990 that the product had been misused and caused "a major hemorrhage to the public revenue", according to Hong Kong's then financial secretary.

After 1992, Section 39E of Inland Revenue Ordinance, together with IRD DIPN No 15 (Revised), modified the structure so that depreciation allowances were only allowed for leases to operators with an air operator certificate from Hong Kong's civil aviation department. Foreign airlines were excluded from using the structure, but local carriers such as Cathay Pacific and Cathay Dragon (formerly Dragonair) continue to enjoy the benefits of this structure.

"I don't think they deliberately set out to kill the leasing industry, but that's what they did," says a source whose career has included work on HKLLs.

"Inside the government, nobody has been thinking of how to use a tax incentive to make Hong Kong a more attractive place, at least not until Dewey Yee, special adviser at leasing company Aergo Capital, mentioned it in the Hong Kong Economic Development Commission," says Lau.

Dewey Yee, special adviser at Aergo Capital

Dewey Yee's surprise phone call

At 9.30pm on 15 January 2013, Dewey Yee was at his home watching a television news programme about the 2013 policy address of Hong Kong chief executive, CY Leung, planned for the next day.

Little did Yee know that he was about to receive a phone call that would lead to him getting involved in a commission established by Leung that was aiming to boost Hong Kong's economy.

Aviation has been the focus of most of Yee's career, having been hired in the 1980s by Tony Ryan as Guinness Peat Aviation's head of marketing in Hong Kong and tasked with opening China to the aircraft leasing business. He also held senior roles at GATX Capital Corporation, Babcock & Brown, Tokyo-Mitsubishi International, Société Générale Asia and China Everbright.

When Yee picked up his ringing phone, a man on the other end of the line started speaking Cantonese, though Dewey, an American, could not understand what he was saying. "So after he'd finished, I said, 'Can you repeat it in English again?' and he said 'The chief executive has set up a Hong Kong Economic Development Commission; we'd like you to join'," Yee told an audience at PwC's Aviation Finance and Leasing Forum in Hong Kong on 8 February 2017, four years later.

Hong Kongers are subject to a seemingly higher than usual volume of nuisance calls with the caller usually speaking in Cantonese, so Yee was at first sceptical. But after contacting a government number provided by the caller he was convinced it was legitimate.

They wanted him to work on developing Hong Kong as an aircraft leasing and financing centre. The gig was pro bono and it would be a lot of work, he was warned.

His wife, Yvonne Remy, turned to him and said: "This is a boy's club. If you're going to join, have a deliverable. Do something."

"So, I replied to him saying I would be delighted to join this commission," recalls Yee.

"Though I thought I must be the last on the list because this guy is calling me at 9.30 at night and the announcement is tomorrow!"

It transpired that the office of the Hong Kong chief executive, through a "highly secret" process, chose Yee, and there was no application process because it is an appointed position. It came as a big surprise to him. "I was among society elites and powerful leaders – I am a nobody," he says.

A few weeks later, Yee had his first meeting as part of the aviation taskforce. He found himself in a meeting room in the Central Government Offices in Tamar with convener Chow Chung Kong, along with Cathay Pacific chairman, John Slosar, and Victor Chu, the founder of Peach, an Osaka-based airline.

Chow went around the table and asked the members to make suggestions on how they could "beef up aviation and make it a stronger presence in the region".

When it came to Yee's turn to speak, he said: "Well, did you know for the past 20 to 30 years, a lot of the global aircraft have been financed through Hong Kong, and my suggestion is that we make Hong Kong an aerospace finance centre."

Yee got "a lot of very strange looks" around the table, with some people "scratching their heads" because they did not really understand what it was all about.

"I'll tell you what," said Yee. "Since I have all these glassy-eyed stares, I'll give a presentation next time and tell you how I'm going to do this."

A couple of months later, in May 2013, Yee prepared 80 PowerPoint slides – only to find he was told he had only 10 minutes for the presentation. He ended up presenting just eight slides and giving everyone the printouts to read at home.

"After 10 minutes, I think everybody in the room understood what I was talking about," he says. "Very simply, it's about money."

"It's about how Hong Kong can create more wealth by just attracting these companies called aircraft leasing companies. Really, it's a big black hole that just sucks up all this cash."

But Yee needed help to make this ostensibly simple plan a reality. He sought three external advisers: one legal, one accounting and one governmental.

"The government person was needed to help me write and draft all these documents so government people can understand," he says.

Yee chose KC Kwok, a former government economist for the Hong Kong Special Administrative Region government.

For the accounting adviser, Yee's friends introduced him to "this young lad who just came over from the UK having been advising the UK government". His name was Clarence Leung, from PwC.

Before going to Leung, he went to his old friend William Ho, who he calls "one of the unsung heroes of aviation law".

So Yee, Kwok, Leung and Ho would form the core team that would take on the challenge of developing Hong Kong into an aircraft financing and leasing centre.

"We have a little code word for our team – H15," explains Yee. "That means Hexagon 15. If you read or understand the I Ching [A Zhou dynasty Chinese classical text], the most powerful hexagon is number 15, and number 15 is humility.

"So, I said the way that we're going to approach all these government departments – and there are a lot that don't understand and don't want this to happen – is we're going to become their best friends. But we're going to do it with a very soft approach – and give them a reason to accept this."

Status and progress of reform

January 2013: CY Leung, chief executive of Hong Kong, establishes the Economic Development Commission to advise the government on the strategy to broaden Hong Kong's economic base, to identify growth sectors and to recommend policies and support for those industries.

July 2013: the Economic Development Commission sets up an aviation task force to examine in detail the feasibility of developing Hong Kong into an aircraft leasing and financing centre.

December 2013: PRC State Council Circular No 108 [opinions on accelerating development of aircraft leasing industry]: "Bringing Hong Kong's strength as an international financial, trading and transportation centre into play, encourage [PRC] aircraft leasing enterprises to set up specialised companies in Hong Kong to develop overseas markets and to enhance internationalisation of the [PRC aircraft leasing] industry."

January 2016: Leung announces in his policy address: "The government is formulating measures to develop Hong Kong into a centre for aerospace financing."

February 2016: John Tsang, financial secretary, announces in his Budget speech: "[The government] shall examine the use of tax concession to boost aircraft leasing business and explore business opportunities in aerospace financing."

January 2017: Proposed Dedicated Tax Regime to Develop Aircraft Leasing Business in Hong Kong paper presented to Legislative Council of Hong Kong members. Recommends halving of corporate tax for aircraft lessors from 16.5% to 8.25%, with only 20% of rentals being subject to this tax, making the effective rate 1.65%.

June 2017: Hong Kong's Legislative Council passes Inland Revenue (Amendment) No. 2 Bill with 46 votes in favour, eight against and two abstentions.

Aircraft operating leasing in transformation

Christian Nuehlen, managing director, Aircraft Finance Germany, looks at market realities for aircraft operating lessors, airlines and specialised firms all tasked with absorbing the significant number of aircraft deliveries now and in the future as the industry heads towards the third decade of the 21st century.

Close to half of the global fleet of aircraft in operation with commercial airlines today is contracted under operating leases. The concept of aircraft operating leases as an alternative to ownership of the aircraft by the operator has enjoyed significant growth over the past decades and is widely accepted as an attractive strategy to manage airline fleet requirements. Operating lessors have enjoyed growth and sustained profitability – even during times of cyclical downturns when airlines were deep in the red.

However, aircraft operating lessors are facing some new industry realities challenging the status quo. New lessors enter the stage almost daily it seems – all trying to claim their piece of the pie. But the pie is not infinite and some lessors might find themselves left only with crumbs.

Leasing market maturity

The aircraft leasing industry has come a long way from its rather humble beginnings. Today, the industry enjoys a high level of maturity on par with its airline customers. However, with maturity come challenges such as:

- in the current low interest rate environment, airlines – even those with less-than-stellar credit – find it increasingly attractive and relatively easy to finance their lift requirements with commercial debt. Banks in the Middle East and East Asia have been at the forefront of offering debt to airlines at interest rates too low to resist;
- spurred by increased competition among the many active lessors on the market, the pressures of consolidation are on in the industry. Lessors face the challenge of growing their existing aircraft portfolios or ending up as targets for takeovers. Financial institutions in China and Japan have been especially active in pursuing lessors, driven by a desire to enter the market or to increase existing aircraft portfolios; and
- a new breed of lessor has emerged in the recent past: operating air carriers with sufficient scope to place large aircraft orders with the manufacturers at greatly discounted prices have established leasing platforms. The reasoning behind this strategy is as simple as it is logical – not only does it provide a way to satisfy and manage internal demand, but also it allows for placement of excess capacity with third-party airlines. This excess may come from deliberate or unintentional over-ordering of aircraft or from an unforeseen downturn in the airline's core operations. But, in any case, having a leasing platform firmly in place provides a welcome pressure valve for the airline to shed unneeded capacity.

Considering these recent market developments, lessors no longer enjoy a seller's market. Airlines today have a choice and are taking advantage of this market reality. By the same token, lessors have no choice but to be far more accommodating and flexible than they used to be if they want to beat out the competition on any given aircraft transaction.

The huge aircraft backlog at Airbus and Boeing will have to be accommodated and concern is mounting among lessors that the pressures of having to place aircraft will drive lease rate factors further down. Airlines will try to capitalise on these pressures and demand ever lower lease rates, more favourable return conditions, more streamlined maintenance reserve payments – if these are being paid at all – and other favourable commercial terms.

Competitive advantage of lessors

Certainly, many factors continue to act in the favour of lessors, primarily regarding economic considerations:

- even with attractive interest rates on commercial debt, few airlines get to enjoy loan-to-value ratios of 100%. Therefore, leasing binds considerably less operating cash of the airline;
- other than security deposits and the cost of closing on an operating lease, up-front costs associated with an operating lease are very manageable. Having to fund predelivery payments for orders placed directly with the manufacturers, either by cash on hand or by incurring commercial debt, is no factor under an operating lease;
- the airline gets to avoid making poor purchase decisions for the wrong aircraft type at the wrong time and at the wrong price;
- the aircraft's remarketability and residual value development is of little consequence to the airline; and

- operating leases typically allow the airline to be far more flexible in its fleet planning and management than placing a purchase order with a manufacturer for a delivery several years out.

To benefit from these competitive advantages, lessors need to be transparent in their approach to negotiating an operating lease with their respective airline partner. It is in their best interest to enter into lease negotiations with an educated airline that has a strong grasp on the complexities of a lease. Airlines, on the other hand, need to understand that the decision by the lessor to lease an aircraft is primarily driven by risk, which can be sub-divided into the following four categories:

1 **Geo-political risk**
   a. Stability of political system in the country.
   b. Sophistication of country's legal system.
   c. Signatory to the Cape Town Convention.

2 **Financial risk**
   a. Airline credit risk.
   b. Airline profitability and balance sheet.
   c. Airline has other aircraft on lease or is new to the concept.

3 **Operational risk**
   a. Airline operational capabilities.
   b. Airline operational history.
   c. Airline fleet size and composition.
   d. Airline is IOSA certified.

4 **Customer risk**
   a. Airline is new customer.
   b. Relationships already in place.

A solid understanding by the future lessee of the approach taken by lessors when entering lease negotiations will set the stage for a successful conclusion of the lease. As is the case with any contractual negotiation, both parties need to be at an equal footing and see eye-to-eye on the matter at hand. This process will benefit from pre-existing personal relationships between the parties, which is why maintaining close ties with leasing companies is key for airline managers – even if no active leases are currently in place between both parties.

Apart from obvious commercial considerations, the airline will want to have financial, technical, and legal expertise weigh in on the negotiations. Not only will this expedite the process towards closing but also it will familiarise the relevant stakeholders with the contents of the lease. This will also assist the airline with living the lease. For instance, active reporting by the lessee will be set forth as a requirement under the lease. This will typically include financial, technical and operational aspects.

Since these disciplines were already heavily involved in negotiating the lease, they will find it easier to meet the airline's reporting obligations. Adequate reporting will also provide a comfort zone for the lessor because nothing is more detested by lessors than surprises. The airline is well advised to communicate pro-actively with its lessor partner – in good times and, especially, in bad.

Operating leases and airline fleet planning and management

The management and administration of an existing lease is a task that will continue throughout the term of the lease. In essence, it will become part of the airline's fleet planning and management and the airline will typically have to concentrate on three distinct areas:

1. Development and optimisation of an existing fleet plan.
2. Implementation and management of fleet plan.
3. Monitoring of fleet management strategy and of aircraft lease agreements.

As part of the first key area, fleet planning will have to determine if the current portfolio of aircraft is adequate to meet the core objectives of the airline. Are the aircraft performing well operationally, commercially, technically and financially? What does the value development of owned aircraft look like? The airline needs to have a solid understanding of the difference between book value and market value at all times during the ownership of

Source: Airbus

Source: Boeing

the aircraft. That way unwanted surprises will be avoided when the time comes to sell the aircraft.

Regarding leased aircraft, the airline will want constantly to review the corresponding lease agreements and identify areas of the agreement that work well and, more importantly, aspects of the lease that do not. Learning from mistakes and shortcomings of past lease agreements is key for improving the next.

Lastly, a strategy for fleet renewal and growth needs to be developed as part of this first area of concentration. This should primarily be based on the observations of the performance – operationally and economically – of the existing aircraft in the airline's current portfolio.

A sound fleet strategy should always be on the look out for optimisation potential. Can the current fleet be optimised by finding an improved balance of owned and leased aircraft? Can the airline identify owned aircraft that are obsolete – operationally, economically, or both? Can these aircraft exit the fleet and generate operational cash or are book values not favourable? In case the airline does not have excess capacity, it may want to consider a sale and leaseback structure.

Many lessors are actively seeking out such opportunities with their airline customers and generally have found it a logical and profitable way to increase their respective portfolios. If the deal is balanced, it will generate operational cash for the airline and relieve it of the burden of ownership. Given the current favourable environment for commercial debt, the airline may also look at finance options for their aircraft replacement and growth initiatives. In any case, it will benefit the airline to be an active participant in the new and used aircraft market.

It does not pay to watch from the sidelines. Even if there is no immediate need for aircraft transactions, the airline needs to keep the lines of communication open with respect to the leasing companies, financial institutions and aircraft manufacturers. It needs to stay on top of market trends and developments to be better prepared for the time when acquisition decisions need to be made. It does not hurt to shop around when it comes to aircraft leasing, either. Not only regarding price of the asset. Different lessors will have different approaches to commercial, technical, legal and financial terms and conditions under the lease agreement.

Finally, the airline needs to have a solid understanding of what it is agreeing to in the lease. For instance, while delivery conditions and aircraft acceptance are given top priority by the airline, often the approach to redelivery conditions is less vigilant. However, this will be a costly oversight eight, 10, or 12 years down the road when the lessor comes knocking waiving the return conditions in the airline's face.

To maintain a healthy relationship with the lessor, the airline cannot afford to be nonchalant regarding its reporting obligations under the lease. This is one key aspect of the monitoring phase of the fleet management strategy in place at the airline. Even with a regular physical inspection interval granted to the lessor, the aircraft will be physically out of touch for the lessor during most of its useful life. To keep comfort levels sufficiently high, the airline needs to implement a strong reporting mechanism for keeping the lessor informed on financial, technical and operational matters. It will be important not only to report on these aspects regularly and in accordance with the provisions of the lease, but also to do so with an adequate level of quality. In addition, the lessee needs to monitor its compliance with all other relevant provisions of the lease.

The management of maintenance reserve payments in line with the agreed on structure and amounts under the lease comes to mind. The airline can rest assured that the lessor will monitor these payments closely and it will help the airline to resolve any potential disputes concerning maintenance reserve payments as long as it stays on top of managing them. The monitoring of the correct payment of such amounts and the proper allocation thereof during a maintenance event play key roles. Towards the end of the lease term, the airline needs to set up for an efficient and successful return of the aircraft to the lessor. Much will depend on adequate preparation and allowing sufficient time for this process. It will go a long way in the airline's relationship with the respective lessor if the redelivery process is managed well by the airline and everything goes smoothly. All too often, however, this is not the case.

Aircraft value development and operating leases

Aircraft residual values and asset value retention will be major concerns of the lessor when placing aircraft on operating leases. This applies to new aircraft deliveries that are being placed on long-term leases and to used assets that are being leased out for shorter terms. The occasional scrapping of a relatively young aircraft aside, the useful lives of aircraft in general are significantly longer today than they were 30 years ago. Consequently, aircraft are available for operating leases for longer periods, making value retention and strong residual values even more critical.

Under an ideal scenario the aircraft lessor will have the capital cost of the aircraft fully amortised before it comes off lease for the first time. The initial cost of acquisition, the interest rate environment and the lease rate factor will all play a role in how successful the lessor will be in achieving its goal of getting an aircraft back unencumbered. Again, a well-negotiated and executed lease agreement will go a long way towards achieving these goals.

What do the specific return conditions under the lease stipulate? Ideally, the lessor will get the aircraft back in full-life condition. More realistically and more commonly, however, the airline will return the aircraft in half-life condition. The quality of the maintenance performed on the aircraft and the quality of the documentation thereof will greatly influence the remarketability of the aircraft for a second and any subsequent lease terms.

However, even if the aircraft comes off lease in mint condition, finding the next home for it can be a daunting task. The tendency by some operators towards installing ever more elaborate buyer-furnished equipment in the premium cabins of the aircraft they operate will present the aircraft lessor with significant challenges once these aircraft come off lease and are returned to their respective lessors. If that will ever happen that is. It serves the leasing industry well to be somewhat sceptical regarding the remarketability of the A380 or the Boeing 777-300ER, for instance.

It is not just the lack of ubiquity. The resources required to perform heavy maintenance and structural checks successfully on these types of aircraft are enormous and only the most sophisticated operators will be able to do so. Maybe there is a market for secondary A380s in the US if airlines there could ever warm up to the aircraft. Or there is a market on some high-density routes to and from slot-restricted airports in Asia as long as adequate airport infrastructure is in place.

Finally, religious pilgrimage requires huge capacity at an attractive cost per seat mile as offered by the A380. But it will not be like placing a used A320 or Boeing 737-800, not by a long shot. Difficulties with remarketing any aircraft will negatively impact its residual value. But even more so regarding widebody aircraft with extravagant cabin configurations and a relatively small distribution among the airlines. It will be up to the leasing industry, the operators, niche players and the appraiser community to manage this risk pro-actively.

Some highly specialised firms will play a vital role in managing risk and exposure for airlines and lessors alike by providing a mechanism to keep the markets in check. Opportunities may arise because airlines suffer from over-capacity or over-ordering and because lessors with speculative orders have not managed to find homes for these aircraft come delivery time.

The occasional airline insolvency can be thrown into this mix for good measure because it will instantaneously free up aircraft that were previously not on anybody's remarketing agenda. Firms possessing the right skill sets, networks and deep pockets will be able to offer a welcome solution by buying into these assets and matching them with lessees in need of capacity. In some instances, these assets will then be made available to an investor base looking for and benefiting from turn-key solutions. Certainly, such firms are niche players, but they provide an essential function to keep markets well-balanced and the economic framework for aircraft leasing and financing at sustainable levels.

Aircraft Finance Germany | Leading firm in global aircraft trading

As one of the leading firms in global aircraft trading, the team of Aircraft Finance Germany (AFG) has successfully closed commercial aircraft deals worth more than $4 billion. AFG aviation professionals have closed deals on virtually all popular commercial aircraft, including narrowbody, widebody, turboprops and regional jets – both in passenger and freighter configurations. AFG draws its unparalleled experience from having taken delivery of a wide array of commercial aircraft from manufacturers, airlines, leasing companies and investors, and have delivered the same wide array of commercial aircraft to airlines, leasing companies and investors. This is aided by the company's global network of partnerships with financial institutions, investors, manufacturers, airlines, banks and leasing companies.

As a strong and reliable member of the global aviation industry, AFG offers tailor-made commercial aircraft solutions to its investor base and aircraft operators alike. The team provides turn-key solutions for investors wanting to participate in the aircraft leasing and financing industry. AFG has developed strategic partnerships with manufacturers, operators and financial institutions worldwide that allows the company to complete the most complex transactions. And AFG does so with a team of aircraft professionals willing to go the extra mile for their partners.

AFG works closely with airline operators, manufactures, banks and financial institutions around the globe. AFG aims to be one of the leading aircraft trading companies in the world as the company's team members have closed over 100 aircraft transactions in recent years and look forward to successful operations in the years to come.

Christian Nuehlen is the managing Director of Aircraft Finance Germany GmbH in Frankfurt, Germany.

New names and narrowbodies for Korean investors

Michael Allen examines how Korean investors are getting savvier with their investments in aircraft, gaining the courage to branch out into narrowbodies, as well as lesser credit airlines.

"In [South] Korea, we need aviation to fly our people in and out of the country – otherwise we have to go through North Korea," says one South Korean aircraft finance practitioner explaining the importance of the aviation industry to his country.

Both aviation and shipping have been pivotal to the peninsula's history since Korea was divided along the 38th parallel after World War II and along a military demarcation line after the Korean War. Since it became impossible to transport goods and people out of the country by land via North Korea, these two transportation industries have been seen as vital to the health of the south.

But while the South Korean shipping industry – along with real estate – has long been a key investment target of Korean institutional investors, investment in aircraft is a new area for them. With the shipping industry now being far from shipshape and real estate returns lacklustre, aircraft are proving more reliable assets for yield-hungry investors.

"Real estate in the US and UK was the first pick from 2009 to 2014 for Korean investors seeking an alternative asset class. Most Korean investors got exposed to the UK, US and even German property but, from the asset allocation perspective, they cannot put all their money in one asset class," explains one source at a Korean securities firm active in aircraft financing.

"The aviation transaction is very standardised and you can easily contact the right person for feasibility assessment and information gathering. Most reputable Korean institutions which have a big presence in the Korean market now have at least one aircraft in their balance sheet."

All of the deals done so far involving Korean investors have been for the crème-de-la-crème credits of the airline industry, with a particular focus on Middle Eastern heavyweights such as Emirates Airline and Etihad Airways.

Matthew Leigh, a senior associate at Norton Rose Fulbright in Singapore, believes Korean investors are showing a greater receptiveness to financings with operating lessors as the demand for aircraft deliveries starts to come from the lessors more than the airlines.

"It is probably reflective of the shift in the market towards the volume of direct lessor orders, but I think that they [Korean investors] are certainly much more aware now of those opportunities – though I think in the same way the investors are looking at the top-tier airlines, the focus will be on the top 10 lessors," he says.

Despite this overwhelming preference for top-tier names, preferably government-owned flag carriers, market sources believe there is room for deal arrangers to introduce lesser credits to the Korean institutional investor base.

"There is still the mentality they want to have a full-service carrier with a strong credit profile alongside a good underlying asset," says a source with experience of the Korean market.

"However, they are now starting to be willing to look at new names in terms of the returns. The credit rating remains important – though provided there is the ability to demonstrate a good asset and that it's a well-run airline with a history of good lease return conditions, then that goes quite a long way now with the investors."

As with Japan's Japanese operating lease and call option market, in which deal arrangers are experiencing more demand from investors than deal opportunities with top-tier carriers can satisfy, Korean arrangers are finding they are needing gradually to introduce new names to their investor clients.

"Korean investors for some of the top-tier airlines seem to have been tapped out at this point, so almost by necessity they are looking at lesser-known airlines," says Ji Hoon Hong, a partner in White & Case's South Korea office.

"I think they are looking at deal possibilities involving those airlines that may not necessarily be flag carriers or household names. Depending on how the structure works, I think deals involving below-top-tier airlines would be seriously considered by Korean players. Some arrangers are quite willing to take a leap forward – maybe a giant leap forward – and try to lead some of these sophisticated and large transactions on their own."

In addition, the deterioration of certain top-tier airline credits such as Air France (because of financial difficulties) and Turkish Airlines (because of political instability in Turkey) means Korean investors may have to look at other names, says a source in South Korea.

Narrowbodies versus widebodies

Korean investors have mostly favoured investment in widebodies over narrowbodies because of the larger, more expensive aircraft offering higher returns than narrowbodies. However, investment in widebodies carries a higher residual value risk and the aircraft are more difficult to remarket at the end of their lease term.

"Korean investors have been attracted to widebodies because they tend to offer higher yields and because Korean investors – just like investors from any other country these days – are hungry for yield. But as they get more knowledgeable about this space, they see the attractiveness of narrowbody aircraft in terms of their stable values and secondary market tradability," says White & Case's Ji.

He cautions, however, that this could be a "double-edged sword", as the yield on narrowbodies would tend to be lower than that available for widebody transactions.

A source from a South Korean securities firm says: "If we consider the market situation separately for widebodies and narrowbodies, we believe the narrowbody market is safer in terms of exit and residual value risk but there is a tough competition among global lessors.

"Lease rates for narrowbodies are getting lower and lower and the rate of return for the equity investment is not very attractive. Still, widebodies can provide an attractive rate of return, so we need to mix up these narrowbodies and widebodies properly and manage the portfolio risk."

One airline that could be a potentially huge target of financing for Korean investors is Vietnam's VietJet Air, which is taking delivery of A320-family aircraft to fuel its rapid growth. Korean investors might feel comfortable with Vietnam as an investment jurisdiction because Koreans have a long history with investing in Vietnam, albeit not in aircraft, say sources.

GECAS portfolio deal

Late in 2016, Mizuho Securities and Meritz Securities launched a seven-year, $900 million fund to buy a portfolio of 20 aircraft from US lessor GECAS. The debt consisted of $655 million from an asset-backed securities issuance by Mizuho Securities, and $244.5 million in equity from South Korean securities and derivatives firm Meritz. The $244.5 million contribution from Meritz consisted of a $150 million mezzanine tranche and a $94.5 million subordinate tranche.

Sources tell *Airfinance Journal* that the portfolio contained some poor credit airlines, such as EgyptAir, in which Korean investors would not usually prefer to invest in a single transaction because of the heightened risk. However, because of the involvement of GECAS – which is the number one lessor in the world by number of aircraft (according to *Airfinance Journal*'s The Leasing Top 50 2017) – investors are sufficiently reassured that the risk could be managed.

"A couple of portfolios are coming around the market but have not yet been done. There are better aircraft and airlines in these, but their servicer names are not good enough from a Korean investor perspective," says a source who works with Korean investors.

Hard to ignore

More and more international players are taking notice of the South Korean market as a viable source of financing for aircraft, and many believe it will remain so for several years to come.

One source says: "It's not going to replace other sources of financing but if you're looking at what's out there at the moment, I don't think that you can ignore it."

Financing the first 100 A350s

Airbus has delivered its 100th Airbus A350 aircraft, 30 months after the first delivery of its latest widebody aircraft to Qatar Airways.

Source: Airbus

The Toulouse-based manufacturer handed over the 100th aircraft to China Airlines in July 2017.

"The 100th A350 XWB milestone comes as we reach our fastest widebody production ramp-up, on track to meet the target of 10 A350 deliveries per month by the end of 2018," says Fabrice Bregier, Airbus COO and president commercial aircraft.

The delivery is the Taiwanese carrier's seventh unit and the third A350-900 that it has received this year. The other four were delivered in 2016, according to *Airfinance Journal*'s Fleet Tracker.

Asia lead

At the end of June Airbus had recorded 628 firm orders for the A350-900 model.

By 31st July 2017 the A350 has been delivered to 14 airline customers and Fleet Tracker shows that 56 deliveries where made to seven Asian operators.

The Middle East represented 19% of the active fleet with 18 deliveries, while Europe had 14 aircraft among three operators. Africa had five with Ethiopian Airlines. Latin America and North America had just two units.

Lessors

Of the 100 deliveries, lessors account for 39 deliveries and airlines own the other 61 aircraft.

Lessors have placed a total of 66 direct orders for the type. Fleet Tracker estimates that 15 deliveries were "pure operating lease" transactions. Sale-and-leaseback deals accounted for the remaining 24 lessor deliveries.

AerCap is the largest A350 lessor with 15 units currently in service. The Dublin-based lessor has two units with Vietnam Airlines, two with Cathay Pacific Airlines, two with Ethiopian Airlines, two with Air Caraibes and two with Sichuan Airlines. It originally placed aircraft with South American carrier Latam, but four units moved to Qatar Airways earlier this year under six-to-12-month leases.

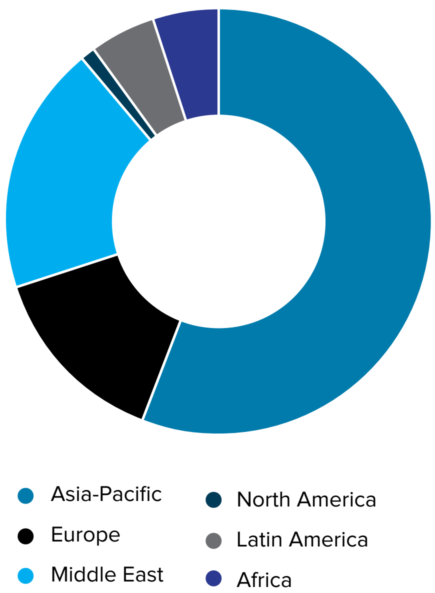
GECAS is the second-largest A350 lessor with 11 units leased to Finnair and Qatar Airways.

Avolon has two units with Thai Airways International and another two with Vietnam Airlines, the data shows.

Amedeo has acquired its first unit, via Amedeo Air Four Plus, from ALAFCO. The aircraft has a lease attached to Thai Airways.

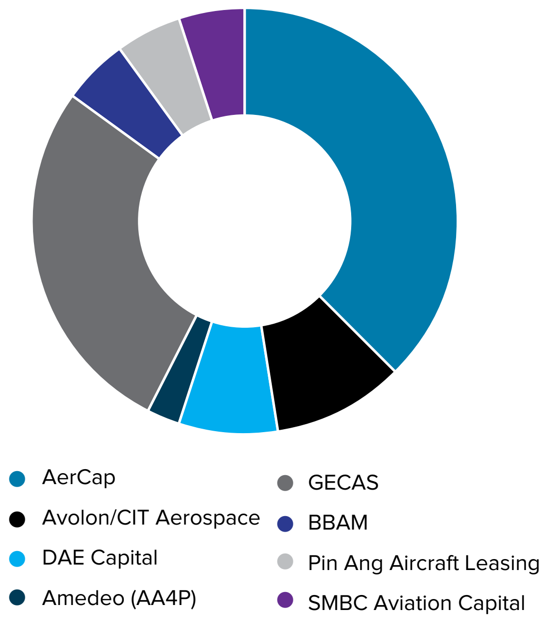
BBAM manages two aircraft on lease to Qatar Airways.

First 100 A350s in service per region



Source: *Fleet Tracker July 2017*

A350s in service fleet per lessor



Source: *Fleet Tracker July 2017*

DAE Aerospace has three A350s on lease to Vietnam Airlines. Pin Ang Aircraft Leasing has two aircraft with Ethiopian Airlines.

SMBC Aviation Capital has two A350-900s on lease to Asiana Airlines. Both units are part of a six-aircraft package acquired under a sale-and-leaseback deal.

Sale-leasebacks

Airlines have used various sources of financing but sales and leasebacks represents a quarter of the deliveries so far, Deal Tracker shows.

Ethiopian Airlines tapped the market for two deliveries with Pin Ang. Vietnam Airlines sold three deliveries to DAE Capital. Another three futures deliveries have been mandated to Pin Ang. Finnair sold five units to GECAS and LATAM agreed a deal with AerCap for nine aircraft.

The first A350-900 was first delivered to Qatar Airways in December 2014 and was financed by GECAS. The lessor has four more units with Qatar Airways under sales and leasebacks.

Qatar also sold two units on delivery to BBAM under sale-and-leaseback deals. It also mandated BOC Aviation in December 2016 for another six aircraft.

Asiana Airlines has mandated six deliveries to SMBC Aviation Capital in a package that includes pre-delivery financing. Two units have been delivered.

Debt

Airlines have also tapped the commercial debt market. Deal Tracker shows that Cathay Pacific financed three deliveries using the commercial debt market with Bank of China as the arranger.

The Hong Kong-based carrier has also mandated a delivery to Credit Agricole-CIB and another two to undisclosed lenders.

China Airlines has financed four deliveries with Bank of Taiwan and Bank of Communications as overall arrangers of debt facilities.

DVB provided the debt for DAE Capital on one unit, on lease to Vietnam Airlines. National Bank of Australia was the debt and overall provider, along with Korea Development Bank as debt arranger.

AerCap financed three A350s on lease to Latam through the commercial debt market in 2016, with BNP Paribas acting as senior lender. The other senior lenders were Development Bank of Japan, KfW IPEX-bank, Helaba and Sumitomo Mitsui Banking (SMBC). Investec Bank was the junior lender.

Finnair has used the Japanese operating lease with call option (JOLCO) market on three deliveries while Lufthansa has refinanced one delivery in the JOLCO market.

The A350 model featured in Labrador Aviation Finance's asset backed securitisation in 2016, while two Latam A350s featured in the Latin American carrier's C tranche of its 2015 EETC.

There has also been appetite from the Korean investor market. Mizuho Securities and South Korea's Meritz Securities set up a fund of about $900 million to acquire a 20-aircraft portfolio from GECAS, although the National Pension Service backed out of the fund.

South America: The last frontier for LCCs?

The landscape for the incumbent airlines of Argentina and Chile is changing, with the domestic economy facing challenges and new entrants.

Source: Jetsmart

Argentina and Chile are gearing up for further competition as two low-cost carriers (LCCs) enter the market.

The two South American countries are the battleground for equity investors, who believe their respective carriers have the model and management team to succeed.

Bill Franke, one of the world's most influential investors in budget airlines, debuted a low-cost carrier in Chile in February 2017. The start-up aims to expand regionally in the coming years.

At the time, Franke, co-founder and managing partner of airline-focused investment fund Indigo Partners, announced initial plans for the new carrier, Jetsmart, which included a three-Airbus A320 fleet.

The carrier received its first aircraft in June, under a lease agreement with CDB Leasing, and operated its first flight on 25 July between Santiago and Calama.

Indigo Partners is already established in the low-cost arena, with ownership of Mexican carrier Volaris and stakes in Wizz Air and Denver-based Frontier Airlines.

Indigo Partners is known for its unbundled fares strategy that characterises ultra-low-cost carriers (ULCC), where passengers are offered basic low prices with the option of paying for extras.

Jetsmart will expand its coverage of the Chilean market this year to include Antofagasta, La Serena, Concepcion, Copiapo Desierto de Atacama, Puerto Montt and Temuco La Araucania.

Indigo Partners has also been in talks to acquire part of Canada's Enerjet after Canada's transport minister announced plans to lift foreign ownership caps in airlines to 49% from 25% in a bid to aid start-ups seeking investors. Enerjet, a charter operator, is looking to establish a nationwide ultra-low-cost carrier with Indigo Partners.

Indigo Partners disposed of its 18.7% stake in European central low-cost carrier Wizz Air in June 2017. The company sold 10.7 million ordinary shares for about $317.1 million but retained convertible shares and convertible notes through its Indigo Hungary and Indigo Maple Hill units.

Franke regards Europe as the scene for consolidation.

"I think over time that will happen in Europe, and we will be a motivator to consolidation," he says.

But in Chile, the large middle class, relaxed foreign ownership rules and clear regulations made the country attractive for Indigo Partners' entrance into Latin America.

The nation's transport minister told industry executives in December 2016 that the government expects $1.7 billion in budget airline investment over the next four years.

"We launch a new endeavour to democratise travel for Chileans by bringing the ultra-low-cost model. We chose Chile because, without a doubt, it offers the best platform in the region for success. Chile has a history of economic growth, political stability, an enviable legal system, a fair and equitable regulatory system, and governments, regardless of party, that support trade and foreign investment. We believe Jetsmart will be a great addition to the Chilean air travel landscape," Estuardo Ortiz, Jetsmart's chief executive officer, tells *Airfinance Journal*.

"Jetsmart is the first ULCC airline in Chile. A combination

Source: Latin American Wings

of brand-new A320 high-density fleet, state-of-the-art digital technology on Jetsmart.com and the structure of Smart fares allows us to offer ultra-low fares and a fully unbundled ancillary product portfolio so customers can choose what they want. Jetsmart has launched its Smart Routes, which do not pass through Santiago, and therefore connect non-stop between regional cities. Smart Routes allow a significant saving in time – around half – and cost since airport fees are paid only once. Jetsmart came to Chile to take the industry onto an evolution and revolution, so air travel is affordable and available to all Chileans," he says.

"Our goal is not to take market share away from existing carriers but rather to stimulate growth and create a new market. Our fares are designed to be low and make flying affordable to people who would not otherwise consider it. Jetsmart focuses on the first-time travellers and has a programme called Nuevo del Aire, which rewards them with special fares and promotions."

Plans for 2018 include the addition of six additional aircraft and, once established in Chile, Jetsmart will eye regional expansion, says Franke.

"Jetsmart will initially operate on domestic flights, but we plan to expand to other countries in the region, after we consolidate our flight here in Chile," he adds.

Jetsmart is the second carrier to launch operations in Chile in two years.

Latin American Wings started operations in January 2016 with $3 million in capital. Investments have reached $20 million in 2017, according to media reports.

Latin American Wings operates five Boeing 737-300s configured with 148 seats, according to *Airfinance Journal*'s Fleet Tracker. It started operations with one unit on the Santiago-Asuncion-Punta Cana route but added two more in 2016 and another two in 2017.

The Chilean carrier has a less aggressive approach to the market and, unlike Jetsmart, operates international destinations to Lima, Mendoza and Punta Cana from Santiago in addition to two domestic destinations, Concepcion and Puerto Montt.

Latin American Wings is Chile's third biggest carrier after Latam Airlines, Latin America's largest carrier, which resulted from the merger of LAN and TAM in 2012, and Sky Airline.

Sky Airline started regular passenger flights in December 2001 with funds from Jürgen Paulmann and made its first flights from Santiago to northern Chile in June 2002.

The Chilean carrier operates throughout Chile as well as to Argentina, Peru and Uruguay with an all-Airbus fleet, including 13 A319s and two A320s. It has secured three A320neo aircraft for the second half of 2018 from lessor SMBC Aviation Capital as part of its $800 million fleet-renewal plans.

"We are absolutely convinced that we have made the right decision and the passenger traffic statistics support that," says José Ignacio Dougnac, chief financial officer of Sky Airline. "We are the first LCC in Chile, and we are recognised by the market as such."

Latam and Sky Airline already serve eight of the planned routes on Jetsmart's future network.

Though Jetsmart and Latin American Wings, for the time being, are just small players in Chile's domestic market, they present a challenge for Sky Airline, which is looking to expand.

Competition is nothing new to Sky Airline, says Dougnac. "We are very used to it; we overlap with other players in almost every route, and there have always been new players in the market coming in and out. What we really want to do is to enable more people to fly in the domestic and international markets, and we can do so because of our low fares."

He adds: "Our lower fares and a point-to-point strategy have encouraged people to consider and to use more the aircraft as a primary means of transportation in Chile, and we hope to continue in that direction."

Sky has been particularly careful to cater to the Chilean market by offering a website dedicated to corporate travel sales for the Chilean business traveller.

Also, Sky prices all its fares on a one-way basis, so a round trip costs twice as much as the basic one-way fare.

"We want to give people the opportunity to fly; therefore, we are very focused on expanding our network in a very efficient way, so we can charge very low fares. As an example, we are already selling $3 tickets, but we are also very on top of our customers' needs. We give a simple service but provide a very consistent delivery on our promise," says Dougnac.

The carrier will incorporate new A320neos as part of its fleet renewal to offer more seats and new destinations.

Part of this $800 million fleet replacement has already started, says Dougnac. Sky will take delivery of six new leased A320neos in 2018 – with three coming from lessor SMBC Aviation Capital and the remaining units from Air Lease.

The carrier is in the market for 12 additional A320neos to add to its portfolio on operating lease.

"For us, the A320neo meets all the conditions we require to achieve maximum efficiency in the operation. We are looking for these operating leases coming in 2019 and 2020," says Dougnac.

Currently, Sky operates 13 A319s and two A320s leased from a variety of lessors, including AerCap, Apollo Aviation, DAE Capital, ORIX Aviation and SMBC. BBAM has the largest exposure to the carrier with six leased A319s.

So far, Sky has favoured operating leases to build its fleet, but Dougnac indicates the carrier is also evaluating purchase orders from 2021 onwards of A320neo or A321neo units.

While Sky may have carved out a niche in the low-cost market, it operates in a challenging environment.

Although Chile is among the safest and most stable countries in Latin America, it faces political uncertainty, with an upcoming general election in November and financial worries because of a long-running mining strike at Escondida, the world's largest copper mine. Chile's economy is heavily dependent on the production and export of copper and copper products, which account for just less than half its exports.

Credit ratings agency Fitch downgraded Chile's long-term foreign currency rating to A from A+ in early August and revised its outlook from "negative" to "stable", as slow growth and low prices for copper put pressure on the nation's fiscal revenues.

The downgrade "reflects the prolonged period of economic weakness and lower copper prices, which are contributing to a sustained deterioration on the sovereign balance sheet", stated Fitch.

"In Fitch's view, growth is unlikely to recover to levels consistent with per capita income convergence with 'A' peers."

The decision by Fitch comes after a separate downgrade by ratings agency Standard & Poor's (S&P) in July, which represented Chile's first credit downgrade since the 1990s.

S&P downgraded its rating on Chile's long-term foreign currency sovereign credit to A+ from AA-, with a stable outlook.

The ratings agency expects the Chilean economy to grow only 1.6% in 2017, unchanged from last year. In 2004, growth reached 7%. Then, after it dipped during the financial crisis, it recovered to 5.8% in 2011 and 2012.

S&P expects GDP growth to rise only modestly to 2% in 2018 and to 2.4% in 2019.

Against this backdrop, the US dollar has been strengthening, putting pressure on Latin American countries. In July, Chile's central bank held its benchmark interest rate steady at 2.5%.

However, Dougnac notes Chile's currency depreciation

"has been less of an issue" during the past two years.

"Growing the international markets, of course, helps offset the exchange rate impact," he adds.

Sky has increased its seats offer in international markets, with four new international destinations during the past 18 months. The carrier is currently flying to six international destinations – Buenos Aires, Mendoza, Cordoba, Rosario, Montevideo and Lima – but Argentina is Sky's most important international market, says Dougnac.

"We are always seeing and analysing new routes to better satisfy our customers, based on an efficient and sustainable operation," he says, adding: "And there is more growth to come."

Argentina gets hotter

In neighbouring Argentina, which Franke called a "nice market", the budget airline industry is also heating up after the nation's transport minister announced in late 2016 that the government expects $1.7 billion in budget airline investment over the next four years.

Across the Andes mountains, Argentina's first ultra-low-cost airline is aiming to break Aerolineas Argentinas' quasi-monopoly, while Avianca and Norwegian are setting up subsidiaries.

Like Jetsmart, Flybondi was also formed by entrepreneurs. Julian Cook, former chief executive officer of Swiss airline Flybaboo, is the chief executive officer of Flybondi. Alongside him are Michael Cawley and Michael Powell, who have roles both as members of the board of directors and as investors. All three bring decades of experience and successful track records in the ULCC sector. In June 2017, Flybondi competed the first round of a $75 million equity raise. Cartesian Capital Group is lead investor, alongside Japanese investor Yamasa, and with other European and Argentine private investors.

"We are very pleased to have such a strong group of

Source: Flybondi

investors in Flybondi. They all have a successful track record of investing in and leading low-cost airlines, says Cook. "This brings us huge value-add in addition to the capital."

Peter Yu, managing partner of Cartesian Capital Group, says: "Powell, Cawley and Cook are uniquely positioned to lead Flybondi. The businesses they have built over the decades have greatly improved access for the travelling public around the world, and they are now bringing this model to Argentina. The market for air travel in the country is ripe for Flybondi, and we will work closely with labour and consumer groups, regulators and other stakeholders to provide reliable, high-quality service to all Argentines."

Bertrand Grabowski, the former head of DVB's aircraft finance division, representing Yamasa on the board of Flybondi, says: "Having followed for more than 25 years the development of ULCC brands all over the world, I am convinced it is the perfect time and place to bring the ULCC concept to a great country like Argentina for the benefit of the people."

He adds: "The management team is top class and brings a wealth of international experience. The new Macri policy is sending positive signals to the international community." Mauricio Macri became president of Argentina in December 2015.

The airline looks to capitalise on a rapidly growing market: the population in Argentina is expected to reach 45.6 million by 2020, according to Trading Economics global macro models and analysts' expectations. This compares with 40.7 million in 2010.

About 92% of Argentina's population lives in cities, with the 10 largest metro areas accounting for nearly half of the population.

Buenos Aires has a population of about three million, with a metropolitan population of close to 13 million. By 2030, greater Buenos Aires is predicted to have 17 million residents.

But the economic situation is challenging.

Argentina has one of Latin America's largest middle-class demographics, but it is shrinking and chronically impoverished by galloping inflation, which even President Macri's team has yet to bring under control.

In December 2015, Argentina scrapped most of its currency controls and allowed the peso to start trading freely, setting the stage for a sharp devaluation.

The peso has devalued almost 60% year-on-year and inflation remains in the region of 22%. But Trading Economics forecasts inflation to drop progressively to 18% over the next year and reach 12% by 2020.

"Argentina will continue to struggle with lacklustre growth for the next few years, as it begins to digest the challenges behind the implementation of President Macri's economic reforms and the woes coming from its key trading partner Brazil," writes Trading Economics in its 2017-20 outlook report.

In 2001, about 25% of the population lived below the poverty line. That figure jumped to 70% in 2002 after the peso got decoupled from the dollar and individual savings lost two-third of their values. The poverty line best estimates are in the 30% to 40% range now.

Untapped potential

But Flybondi's Cook believes that Argentina has the potential to become a mature economy.

Today, less than 7% of the population travels by aircraft, says Cook, adding that the Argentine market represents about 10 million passenger trips a year. He estimates that three million passengers travel three to four times a year by aircraft.

"The propensity to fly in Argentina is below other Latin America countries. In Chile, it is 2.5 times higher. Argentina may have larger cities than Chile, but still 10 million passengers fly in Chile for an 18 million population," says Cook.

"The travelling population of Argentina should be in the 30 to 40 million range," he adds.

Cook highlights the importance of bus transportation in Argentina but is hopeful that passengers will turn to flying thanks to low-cost airlines.

A flight between Posadas and Buenos Aires takes 75 minutes, he says. Aerolineas Argentinas flies the route three-times a day, the equivalent of 180,000 passengers a year. The same route attracts more than 500,000 passengers a year by bus, despite a 13-hour journey, he says. Bus companies are charging more than what a low-cost carrier can charge, adds Cook.

Flybondi expects to transport 10 million passengers in five years' time and double the air travel market in Argentina.

The carrier has already signed lease agreements for two 737-800s, and expects to be operating a fleet of 10 aircraft by the end of 2018.

The start-up carrier has signed an agreement with the Government of the Province of Córdoba to set up its first base and start operations there in the fourth quarter of 2017. It also has presented a plan to the national government to set up what will become its main base at the military airport of El Palomar in Buenos Aires.

Norwegian pays price of aggressive expansion

Norwegian is clearly disrupting the long-haul market, where its introduction of transatlantic services has prompted other airlines to launch their own low-cost, long-haul operations.

But the Scandinavian carrier's unit costs have surged as it struggles to maintain cost discipline across a rapidly expanding fleet.

Norwegian Air reported its second-quarter results in July 2017 and the headline figure appears encouraging: Net profit jumped 45% from the same period last year, to NOK 1.08 billion ($131 million), while operating revenue increased 17% to NOK 7.77 billion.

However, EBITDAR earnings for the period were NOK 1.19 billion, 21% lower than in the second quarter of 2016.

Even worse, Norwegian's first-half EBITDAR totalled NOK 382 million, a huge drop from NOK 2.02 billion a year ago. As a result EBITDAR margin was 2.9%, compared with 17.5% a year ago.

Operating expenses, meanwhile, jumped 45% to NOK 6.78 billion as the low-cost carrier expanded rapidly.

Fuel was the biggest expense at NOK 1.74 billion, a 38% rise on last year, as jet fuel prices increased by 15% in the quarter.

Labour cost of NOK 1.26 billion was up 34% as staff numbers rose to handle increased flying. Maintenance expenses rose by 56% to NOK 647 million due to the airline's bigger fleet.

Norwegian flew 8.62 million passengers in the quarter, up from 7.72 million in last year's corresponding quarter. RPKs (revenue passenger kilometre) traffic rose 19%, as did the airline's available seat kilometre (ASKs) capacity.

Results for the first half to the end June were less positive as the first quarter's NOK 1.5 billion loss outweighed second-quarter profit. Interim net loss amounted to NOK 412 million, compared with a NOK 54.7 million loss in the first half of 2016.

Norwegian added four leased Boeing 787s and 19 leased 737-800s to its fleet over the 12 months to 30 June. At the end of June it also received its first two 737 Max aircraft, which took its fleet total to 133.

Norwegian is aggressively investing in transatlantic services. The carrier will increase long-haul capacity by 60% this year and growth will double next year, according to broker firm Davy.

"Not for the first time, the main takeaway from Norwegian's quarterly results is a negative ex-fuel cost surprise - this time down to additional leasing/maintenance and personnel costs," writes the firm.

"While Norwegian's rates of growth make the scaling process difficult, the continuing scope for negative cost surprises is a concern for investors and will limit the stock's multiple potential."

According to its latest forecast, Norwegian expects a 25% growth in ASKs in the third quarter and a 30% growth in the final quarter of this year.

Unit revenues down, unit costs up

Norwegian says unit revenue was NOK 0.32 for the first half of 2017 while unit cost reached NOK 0.44. A year ago unit revenue was NOK 0.36 for the first half while unit cost was NOK 0.41.

Norwegian says second-quarter unit cost excluding fuel rose 7% year-on-year, while it was up 9% with fuel. Staffing cost climbed 12% due to the ramp up of international operations.

Norwegian has now reached its highest second-quarter cost per available seat kilometre (CASK) since the second quarter of 2010.

More expensive fuel, a 16% increase per ASKs, was driven by spot prices and a weaker Norwegian crown against the US dollar, says the carrier.

Leasing cost, up 22% per ASKs, was due to a higher proportion of leased and wetleased aircraft, says the Scandinavian carrier.

The carrier was also hit by a higher technical cost (31% increase per ASKs) due to price escalation on engine maintenance, a higher proportion of leased aircraft and ground damages.

Cost guidance for 2017 is now at NOK 0.42 per ASKs versus the airline's previous guidance of NOK 0.39-0.4.

Norwegian's mounting costs weigh on cash flows and therefore its debt-encumbered balance sheet.

Shareholder equity represented only 8.7% of its total liabilities at the end of the second quarter. At the end of 2016 it represented 12% of its total liabilities.

Equity at the end of the second quarter was NOK 3.54 billion compared with NOK 4.05 billion at the end of last year.

Equity decreased mainly due to net losses in the period of NOK 412 million and exchange rate losses from subsidiaries of NOK 105 million.

There are also questions about the departure of chief financial officer Frode Foss, who has been at Norwegian since October 2002. His successor will have a difficult task to keep costs under control while continuing Norwegian's growth strategy.

Flying cheap, flying long...and hanging on?

Low-cost, long-haul (LCLH) air travel – once the preserve of tall-talking, short-living mavericks – has gained a certain credibility.

Source: Level

When Level launched its inaugural Barcelona-Los Angeles service in June 2017, its parent IAG became the eighth full-service airline group to operate an LCLH. Once Joon takes off later this year, Air France-KLM will be the ninth.

Nonetheless, hard questions about the sustainability of the LCLH business model remain. Years of cheap credit and relatively cheap fuel have kept underlying and operational costs down, but will there still be 15 or so (definitions vary) LCLH carriers after the economic cycle bottoms out?

In Europe, some describe the legacy carriers' new ventures as a response to Norwegian, the most aggressive LCLH operator on transatlantic routes: British Airways and Lufthansa can't be caught with their pants down again, as they were once by Ryanair, the theory runs.

While there may be a little truth to this, it is an overly simplistic explanation for several reasons: The cost advantages of low-cost carriers (LCCs) are extremely hard to replicate in long-haul operations; legacy carriers are better equipped to compete on longer routes; and there is considerable divergence of strategy within the LCLH sphere, unlike among LCCs, most of which now follow the Southwest/Ryanair model.

LCLH in Europe

Europe's big three airline groups demonstrate the varied approaches. Lufthansa subsidiary Eurowings began long-haul flights in 2015 using 310-seat Airbus A330-200s, of which it now has five leased from GECAS, according to *Airfinance Journal*'s Fleet Tracker.

By the end of 2017 Eurowings will offer 13 long-haul destinations from its base in Cologne: five in the Caribbean; four in the United States; two in Thailand; two in South Africa; and Mauritius.

Rather than opening new markets, however, some of those routes may be substitutional, with Lufthansa dumping poor performers on its budget subsidiary. Analysis by Barclays Capital suggests that Eurowings' long-haul services are unprofitable and that its parent has limited ambitions for LCLH operations.

"We think its primary reason for existence is to lower the Lufthansa Group cost base (either by intimidating unions into accepting savings, or by taking over mainline routes)," write Barclays analysts in a February 2017 report into the low-cost, long-haul sector.

Like Eurowings, Level operates A330-200 aircraft, although its units – exercises of IAG options – are brand new.

The carrier should increase its fleet to five A330s through 2018, as it adds routes and bases from an initial selection that runs from Barcelona to Los Angeles, San Francisco (Oakland), Buenos Aires and Punta Cana.

"We're looking at European cities such as Paris and Rome which benefit from Vueling feed," an IAG spokesperson tells *Airfinance Journal*.

"IAG has existing assets in France, like our long-haul operation OpenSkies, which we are evaluating and which can grow, but we are considering various options," the spokesperson adds.

Level's crew are sourced from Iberia and although they enjoy the same pay, their contracts focus on "flexibility, fewer labour restrictions and greater availability", according to IAG.

"Level appears to be very competitive on unit costs, but it hasn't caused too much aggravation with unions because it is not flying from any of IAG's hubs," Oliver Sleath, European airlines analyst for Barclays Capital, tells *Airfinance Journal*.

In contrast to Level's smooth start, Eurowings has suffered significant industrial action, leading to hundreds of cancelled flights in late 2016.

As bad as those problems were, however, they paled in comparison with the rolling strikes experienced by Air France-KLM over the past few years. As a result, the Franco-Dutch carrier has had to plan the introduction of its own LCLH arm extremely carefully.

Starting in the Autumn 2017 from Paris-Charles de Gaulle, Joon will launch medium-haul operations with six Airbus A320/A321 aircraft, and then progress to long-haul by the summer of 2018, at first using A340s but then A350s from Air France-KLM's order stream.

By summer 2021, the mix is expected to be: six A320s, 12 A321s, and 10 A350s.

In July 2017 Air France signed a five-year cabin crew collective agreement with two major cabin crew unions over its previously proposed airline project Boost.

A deal over Air France's Boost project was approved by the SNPL pilots' union earlier in March. Air France pilots will fly the aircraft under a wet-lease deal that includes different labour agreements for cabin crew. These are forecast to contribute to 15-18% lower unit costs for Joon.

Joon will not be a low-cost airline as it will offer "original products and services" that reflect those of Air France, confirms the French flag carrier. The new carrier is aimed at a young working clientele, "the millennials (18 to 35 year-olds), whose lifestyles revolve around digital technology".

"We started with our target customer segment, the millennials, to create this new brand that means something to them. Our brief was simple: to find a name to illustrate a positive state of mind. This generation has inspired us a lot: epicurean and connected, they are opportunistic in a positive sense of the word as they know how to enjoy every moment and are in search of quality experiences that they want to share with others. Joon is a brand that carries these values", said Caroline Fontaine, Air France's vice president brand.

The new carrier aims to capture new customer segments on ultra-competitive routes, and to take over some of Air France's loss-making flights.

"Whether Joon will really have competitive costs in the long term is debatable," says Sleath.

Aircraft choice

Labour savings are one of the most effective advantages that start-up carriers can leverage over incumbents, but it pays also to examine fleet selection.

Norwegian, for instance, saves more than 40% on crew expenses for its Boeing 787 aircraft when compared with legacy carriers, Barclays Capital estimates, but ownership costs are significantly higher due to Norwegian being a weaker credit and its low initial volume of orders.

The investment firm estimates that Norwegian would pay about $1.1 million per month in lease rentals for a 787-8, versus $900,000 for a big legacy carrier.

And while Norwegian highlights the fuel efficiency of the 787, this advantage remains limited during a period of relatively low oil prices, since competitors with older aircraft can offset extra fuel burn with drastically lower financing costs. Eurowings' 14-year-old A330s, for example, rent for about $300,000 per month, according to Avitas.

"At these oil price levels the A330 seems to be the optimal solution; I think it is probably the most popular platform for LCLH at the moment," says Sleath.

The future: low-cost, medium-haul

Expensive 787s aside, Norwegian has another element to its fleet strategy that could prove a better fit for LCLH operations: long-range narrowbodies.

The introductions of the A321LR and, potentially, the 737 Max 10, could reshape medium-to-long-range air travel, opening up a plethora of extended, thin routes.

"We think it is beyond doubt that aircraft like the A321LR will fragment the route network on the Atlantic," says Barclays Capital.

Last year Norwegian changed an order for 30 A320neos to the same number of A321LRs. For eight-hour flights, such as London-Boston, Barclays Capital estimates that the latter aircraft has 25% lower seat costs than the 787-8.

Norwegian obviously spots the potential, as it begins narrowbody flights between secondary airports in the UK and US, with a launch service from Edinburgh to Stewart Airport, New York. For these flights it will use 737NGs until its first 737 Max aircraft arrive later in the summer.

Another advantage of long-range narrowbodies is that they offer a cheaper way of scaling up an LCLH fleet to a size where economies of scale in maintenance, financing and training begin to materialise.

This should only strengthen the argument for a new middle-of-the-market aircraft, which many airlines and lessors hope that Boeing will announce.

Not only would such an aircraft fill a niche left empty since Boeing halted 757 production in 2004, but it would also tap into potentially the most disruptive business model since the advent of the low-cost carrier.

Headwinds hold back carriers

North African airlines have faced a number of challenges in recent times, including a dearth of export credit financing, geopolitical instability and several terrorist attacks. Jack Dutton investigates.

Brian Pearce, chief economist of the International Air Transport Association, told delegates at the fourth Iata Airline Cost Conference in 2016 that carriers had "never had it so good" and, after decades of poor performance, airlines were finally making money.

The representatives from North African airlines, who were in the audience during the speech, looked at each other in a way that said Pearce's statements were far from their realities. Over the past few years, the region has witnessed geopolitical instability with the Arab Spring and several terrorist attacks, often in regions where tourism plays a vital role in the local economy.

"As someone who has been to all of these countries, you can see the diminished air traffic," says one industry source, who works with several airlines in the region. "I was at the pyramids in Cairo a few years ago, and some people came up to me saying 'We miss the Americans, we miss the Europeans'."

One striking example of an airline that has been negatively affected is Tunisian flag carrier Tunisair. Its traffic suffered after a terrorist mass-shooting against foreign tourists on a resort in Sousse that killed 38 people.

One leasing executive, who works with North African carriers, tells *Airfinance Journal*: "Tunisair has suffered a lot because they had less tourists come into the country since the attacks. The same thing happened in Turkey with Turkish Airlines."

As well as seeing a drop in tourist numbers, North African regions that have been affected by terrorism and political instability have experienced some hesitation from lessors, says the source. "I think they are more reticent right now. Overall, it's not stable, but people are still doing deals. It's just that when the airlines in those regions go to the market themselves, they often find it harder to get the financing."

If there is a dampening in tourist traffic, overcapacity can be a concern. One industry source says that EgyptAir has got some widebody capacity but "doesn't really need it" and "there's a move away from needing a Boeing 777 and Airbus A330 into something that's not as large as that" with some of the North African carriers.

Morocco's safe haven

Seen as a more politically stable region than some of its neighbours, Morocco does not seem to be experiencing the same pronounced negative effects as some of the other North African countries. Royal Air Maroc (RAM), the country's national airline, is viewed by many in the industry as being the main African airline that connects Africa with Europe, the Middle East and North America.

But that has not stopped the carrier's operating

environment from being challenging. Like many carriers in Africa, RAM has financed a number of its aircraft with help of export credit agencies (ECAs). But with the current inactivity of the main ECAs, airlines such as RAM have had to look at alternative financing options.

Although the airline initially issued a request for proposal to fund three 787-8s by the Export-Import Bank of the United States, (Ex-Im) the dearth of export credit financing has caused it to look at other modes of financing. Although this has been negative for some carriers in the region, Yassine Berrada, vice-president corporate finance at Royal Air Maroc, says the carrier has not had its financing options limited through Ex-Im Bank's current inactivity and political instability in the Middle East and North Africa (MENA) region. RAM closed three commercial deals for three new 787s in 2016, with the loans being paid in euros from two Moroccan banks.

Unlike many African carriers, RAM has not seen a decline in interest from some of the banks when financing the aircraft. "We've had offers on both leases and commercial financings," says Berrada. "We did not expect to see the interest we saw. We had South African banks, European banks, US banks approach us – frankly, we were quite amazed. I think the appetite was due to the strong credit risk of the airline."

The carrier will be taking delivery of more 787s and a 737 Max aircraft from 2018 to 2020, which it looks likely to take on its balance sheet. Berrada adds that the carrier will lease all incoming aircraft in 2017.

"Although we have no big problems, still we are working in difficult environments," he says. "Indeed, despite Morocco being a safe haven within the region, an average European or American considers Morocco as part of the North Africa-Middle East troubled region. As a consequence, foreign tourist (excluding Moroccans abroad) arrivals dropped by 4% in 2016 after a drop of 5% in 2015."

Berrada adds that the airline has seen an 11% growth in

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- Regularly act as Irish counsel on European Export Credit Agency supported financings of Airbus and ATR aircraft
- Advised the Export-Import Bank of China in respect of its financing of Airbus and Boeing aircraft

traffic at fiscal year-end 30 October 2016, thanks to the performance of its Casablanca hub and new routes from this hub. The first two months of 2017 fiscal year are in the same trend of two-digit growth in traffic and he hopes traffic will continue growing by a two-digit percentage at the end of next year.

Although Berrada is optimistic about Morocco, he is less optimistic about North Africa as a whole. "The global environment is not helpful for tourism in North Africa right now. At the moment, many Europeans prefer going to Portugal and Spain – they see them as safer."

The main part of the carrier's traffic is connecting Africa to Europe and the Middle East. Berrada says that this traffic is growing, but he has seen a decline in competition from foreign carriers into Morocco.

"EasyJet has decreased this year from Morocco," he says. "Like us, they have seen that the pure Moroccan-Europe tourism is decreasing, so there is less LCC [low-cost carrier] competition."

Algeria's oil and ECA worries

Unlike Morocco, its neighbour Algeria is mainly an oil-driven economy. The country's two main airlines in Algeria are Air Algerie and Tassili Airlines.

The leasing source says: "Now with the oil price going down, it's less financially attractive for those airlines, because Air Algerie is owned by the state and Tassili Airlines is owned by Sonatrach, an oil company."

Air Algerie has a fleet of 59 aircraft, comprising 25 737-800s, 12 ATR72-500s, eight A330s, five 737-600s, three ATR72-600s, two 737-700Cs, three 767-300s and one Lockheed Hercules L100, according to *Airfinance Journal's* Fleet Tracker. Tassili Airlines operates a fleet of 15 aircraft, indicates Fleet Tracker: four 737-800s, four Q200s, four Q400s and three Beech 1900s.

"They use a lot of ECAs," says the leasing executive. "But they have a problem with that because Ex-Im and the European ECAs are not doing many deals right now. If there is any expansion from the airlines, it would be by acquiring aircraft from lessors or using commercial banks to finance aircraft. Sometimes international banks will finance them but it will be more expensive. In my view, they will have no choice – they will have to go to lessors to have 100% financing."

Egypt's other opportunities

Egypt is also experiencing its own problems, at times finding it difficult to attract the foreign investment its tourism and airline industry needs.

"I think the Arab Spring came as such a shock to everyone, it really has changed the culture among foreign investors. Political risk is now part of the due diligence process in a way it hasn't been previously and I don't see that changing any time soon," says Victoria Mackay, founder of VLM Advisory, a MENA political risk consultancy.

She adds that it takes only one big incident such as the Russian Metrojet passenger aircraft coming down over the Sinai Peninsula in 2015 to reduce the amount of foreign investment into that country.

In response to these attacks and a change in the Egyptian tourism landscape, Cairo-based airline Nile Air has managed to find additional revenue through other avenues by adding new routes to its network, such as from Sharm El Sheikh to Amman in Jordan.

Speaking to *Airfinance Journal*, the carrier's chief executive officer, Ahmed Aly, says: "I think one thing financial institutions and leasing companies understand is that Egypt's still a very strategically-important country and there is an overriding sense of stability despite the challenges that the country faces.

"It does pose a challenge having our dominant currency devalued in November. But with our airline, we're not just relying on local currency – you also rely on currencies like the Saudi riyal and Emirati dirham, which also provides a support system."

Aly adds that Egypt is "not reliant on just tourism traffic" and it is viewed a geographically attractive location across Africa and the Middle East.

EgyptAir, the country's flag carrier, operates a 75-aircraft fleet, including A320s, A330s and A340s, as well as 737-800s and 777-300ERs, according to *Airfinance Journal's* Fleet Tracker.

The airline is due to issue a request for proposal (RFP) in the coming weeks, adds the leasing source. The RFP will be for 250-seater narrowbody aircraft, according to the source, who adds that the carrier will be open to all types of financing to fund the deliveries.

Increase risk monitoring from lessors

Mackay has seen an increase in lessors carrying out political risk analysis when determining which airlines to work with in the region.

Phil Seymour, chief executive officer of aircraft advisory IBA, agrees. "Typically, a lessor will go and visit an airline and the aircraft every two or three years. We've seen that they're now taking the opportunity to get in there more frequently. Coupled with that, the local currencies in the region are probably worth less now, and all of the costs are in dollars: fuel, leases and financings are probably based on US dollars that are probably going to be more expensive for them now."

When looking at credits in the region, lessors often have to look further than the profit and loss and the balance sheet of the airline. They also look at the airline management teams, the capacity, the codeshares and the alliances – to name a few variables.

"It brings up a whole new area in terms of assessing the risk in those areas from a lessor perspective," says Seymour.

Mackay adds "It's very difficult to conduct due diligence on a company or individual in that region without assessing their political context because political change has such a bearing on the financial fortunes of local entities and individuals."

Seymour says that if the situation is to improve for North African airlines, security needs to remain a priority for the countries in which they operate.

"They've got to think, 'We've got to prove to the industry that we're a safe place to be'. There is nothing much they can do about the low oil price, but they can do a lot about security," adds Seymour. "That's within their control."

Lower lease rate factors unnerve lessors

Lease rate factors are continuing to fall to what some believe are unhealthy levels, partly driven by fierce market competition and a desire for lessors to expand their Asia-Pacific businesses, market sources tell *Airfinance Journal*.

Lessor sources report seeing lease rate factors lower than 0.60% on various financings.

"The reality is that, yes, from time to time we see some very low lease rate factors. Even where the lease rents are not far off-market, there may have been a relatively high price paid for the aircraft asset which squeezes the return," says one Singapore-based market source.

"Due to the amount of liquidity still in the market and strong competition among lessors, many airlines have no problem acquiring aircraft for decent rates, and those doing sale and leasebacks often benefit from premium pricing."

The person adds that some leasing companies – many of them based in Asia – appear to be under pressure to rapidly grow their portfolios – which inevitably leads to a willingness to sacrifice return for scale.

A Hong Kong-based leasing company source agrees, saying that the ball has moved squarely into the airline's court in terms of negotiating power on lease deals.

The risk is that airlines will become "spoilt" by these cheap deals, the person says.

The person has heard that certain Chinese lessors will tell their airline customers: "Take whatever offer our competitor has made you and then take 5-10% off it – that's what we'll give you."

While he doubts that airlines will lose money on these deals, they may experience problems at the end of the lease in terms of managing the residual value.

A Hong Kong-based banker agrees, saying: "Many people just assume they will have traded those assets before the expiry of the lease term, but I'm not sure you can entirely rely on those assumptions. The lessors will have to bear the burden of refinancing, remarketing and reconfiguration costs."

The Hong Kong-based leasing company executive adds that he has seen eight-year lease tenors for widebody aircraft – something that was previously rather rare. He has also seen five- to eight-year leases for narrowbody aircraft.

An executive at a Chinese carrier tells *Airfinance Journal* that for 2017/18 deliveries, he is seeing "pretty good pricing from local lessors", which is better than what he was seeing last year.

"Especially for some local lessors which are very aggressive in pricing," he says.

The Hong Kong-based banker says this problem is the result of "a lot of money chasing a couple of deals and that translates into high purchase price and low rentals – the famous 'high-low deals'".

"You really need to have a high leverage to make it work. As long as you have high loan-to-values (LTV) and cheap financing costs it works, but if you don't meet those two conditions then leasing is not profitable at all. You just accept a lower return, a lower lease rental. They may take the view that they will resell those leases to somebody else down the road.

"They are just in an easy bubble market now so it's ok as long as the money keeps going...but it's not going to end in a pretty manner I guess."

Moody's China downgrade

On the capital markets side of the business, market sources in China and those who do business there are observing the potential impact of Moody's recent downgrade of China's sovereign credit rating to A1 from Aa3 and change of outlook to stable from negative.

A lawyer based in China who works on aircraft finance transactions tells *Airfinance Journal* that the impact on domestic deals will be limited, but that international transactions could be hit.

"Of course, there are many Chinese leasing companies who have set up and then the borrower will be an Irish special purpose vehicle that intends to borrow from banks in Europe, Singapore or Hong Kong." He says.

I guess in that kind of scenario, the funding cost and maybe some of the documentation will be impacted, but how that's going to be is yet to be tested."

The lawyer adds that the market will also need to see how the other rating agencies react to Moody's downgrade.

A Singapore-based law firm partner says the downgrade may make it more expensive for some Chinese businesses, including airlines and lessors, to borrow US dollars from non-Chinese banks and investors, and to issue debt successfully into international markets.

"This could drive them to borrow more from domestic Chinese banks – which might lead to a further downgrade in due course given this one has largely been driven, as I understand it, by concerns about the amount of domestic Chinese debt," he says.

A Hong Kong-based banker says that the "logical impact" of the downgrade would be that upcoming bonds from the downgraded entities will come at a "slight premium".

"The markets are not always entirely rational – far from it, but I would expect the upcoming bond issues to be a bit more expensive for those leasing companies. Then that would put the aircraft secured bank financings a bit more on the radar screen of those leasing companies that have been financing themselves through the bond markets," he says.

Questions linger over Gulf backlog

The Middle East has underpinned twin-aisle sales for much of the past decade, while Gulf carriers alone account for more than a third of the current widebody backlog among airlines.

In the long term, Boeing predicts that the Middle East will have 17% of the global widebody fleet, which it expects to double to about 10,000 aircraft by 2035.

Aircraft sales have slowed since 2016, however, and last year Deloitte estimated that 13% of global orders was liable to deferral or cancellation.

Some aircraft categories are more at risk, notably the Boeing 777, which has two-thirds of its orderbook concentrated in the big three Gulf carriers: Emirates Airline, Etihad Airways and Qatar Airways.

"Will they need them at the pace they signed up?" questions Richard Aboulafia, vice-president, analysis, at Teal Group.

At the time of its report, Deloitte said the Middle East had "virtually no vulnerable backlog", even though the region was already responsible for 163 Boeing 787 and Airbus A350 cancellations worth roughly $21 billion – more than North America, Europe and China put together – according to *Airfinance Journal*'s Fleet Tracker.

Since the report's publication last summer the Middle East has suffered a further 25 cancellations of aircraft with a combined market value of $642 million. These were all narrowbodies, but in December 2016 Emirates deferred 12 A380s, and some suspect it will push back more deliveries after a disappointing performance in 2016/17.

The Dubai-based carrier blamed a 71% fall in operating profit partly on "increased competition and overcapacity in many markets".

"Emirates' backlog stands out as most at risk because it is the biggest," says Aboulafia. Emirates has 171 new and current-generation 777s on order, more than the aircraft's next five biggest customers put together.

IBA Group chief executive officer Phil Seymour suspects that Emirates' A380 deferrals may well turn into cancellations – an opinion shared by Aboulafia – while other deliveries may be delayed.

"I wouldn't be surprised if we did start to see more deferrals; it's part of what happens with capacity management," he says.

In April 2017, after heightened security was imposed on passengers flying between the Middle East and United States, Emirates cut several key transatlantic frequencies, although the airline said the capacity would be redeployed.

Together, Emirates, Etihad and Qatar operate 496 widebody aircraft (worth almost $54 billion) – about 10% of the global widebody fleet – inside a region roughly the size of Hungary.

Mindful of the tight squeeze, Etihad has looked abroad for growth, taking shareholdings in other airlines in order to drive traffic to its Abu Dhabi hub.

CEO James Hogan, the strategy's architect, said that Etihad's 2013 order for 199 new aircraft would enable it to "offer capacity where and when it is most needed within the equity alliance".

Yet several of Etihad's investments have gone sour. It has all but written off the €1.7 billion it pumped into Alitalia in 2014, while struggling Air Berlin has been forced to offload aircraft.

Etihad itself is expected to cut capacity growth in certain markets as well as staff through 2017. This includes Hogan, who is to step down.

That leaves Qatar Airways, the only one of the big three Gulf carriers to place a significant order since 2014.

Qatar added 13 destinations in 2015/16, and said in its maiden annual report that it remained "deeply committed" to a growth trajectory that would see it add a further 17 in 2016/17.

Unlike at Etihad or Emirates, there has been no talk of job cuts at Qatar, and chief executive Akbar al Baker said in March that he expects double-digit growth this year.

However, those plans were thrown into jeopardy by a diplomatic crisis in which four Arab countries have banned travel to and from Qatar, throwing its flag carrier's short-haul network into chaos.

Qatar Airways also suffered an almost one-third fall in operating profit during the 2016/17 financial year.

DAE and Avolon: Climbing the ladder

The purchases of AWAS by Dubai Aerospace Enterprise (DAE) and CIT Aerospace by Avolon mark the biggest shake-up of aircraft leasing since Aercap paid $7.6 billion for ILFC in 2014.

That deal propelled AerCap to the top of the leasing table. At the end of the first quarter AerCap owned and managed 1,131 aircraft, which was second only to GECAS, according to *Airfinance Journal*'s Fleet Tracker.

Like AerCap, DAE is acquiring a larger rival, and the immediate purchase of AWAS would triple its fleet to 332 aircraft. After the Avolon-CIT consolidation, this would catapult DAE from the 24th-largest lessor by aircraft count to the seventh, sandwiched between BBAM (395 aircraft) and BOC Aviation (327 aircraft).

Meanwhile, a combined DAE-AWAS portfolio would be worth $11.4 billion, the eighth-largest in the leasing community and one place behind SMBC Aviation Capital ($13.4 billion).

DAE's managing director, Khalifa Al Daboos, has described the tie-up as "strategically compelling", and it is clear that Dublin-based AWAS would add strings to the Dubai manager's bow. Post-merger, for instance, narrowbody aircraft comprises two-thirds of DAE's portfolio, a radical shift from its current roster of 38 widebodies, 35 narrowbodies and 48 turboprops.

AWAS would also tilt DAE's axis from the Middle East (where Emirates 777s and A330s account for more than a third of portfolio value) towards Europe, where its fleet share would rise to 19% from 13%, and give DAE a foothold in China, where currently it lacks any customers.

Since the deal went through, DAE Capital has 17 aircraft in China, 95 in the rest of Asia, 63 in Europe, 37 in the Middle East and 29 in North America, according to Fleet Tracker.

Despite a broader reach, however, DAE's elevated ranking would be threatened by a muscular chasing pack of lessors.

Its order stream of one ATR72-600 turboprop plus 15 A320 family aircraft from AWAS is miniscule compared with those of BOC Aviation, Air Lease (ALC), Aviation Capital Group and ICBC Leasing – which boast a combined backlog of close to 1,000 aircraft.

Avolon has no such problem: Combined with CIT's orders, its backlog has swollen to 274 aircraft, according to *Airfinance Journal*'s Fleet Tracker.

Those new aircraft augment an already sizeable portfolio; together, Avolon-CIT sits third in the current lessor rankings with a fleet of 585 aircraft worth roughly $21.4 billion.

Of these, 76% are narrowbodies (down from 81% pre-merger), 16% are widebodies and the rest are regional jets.

CIT has also helped to balance 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 from 9% to 19%.

The proportion of aircraft operating in Europe, Latin America and China remains broadly stable at 21%, 13% and 8% respectively, though that latter figure may rise given Avolon's bullish forecasts for China.

The lessor, whose customers include China Eastern Airlines, Hainan Airlines and Tianjin Airlines, reckons that China will need 3,200 new aircraft over the next decade, 750 more than current orders account for.

Given Avolon's Chinese ownership, it seems likely the lessor will seek to capitalise on that demand.

DAE's acquisition of AWAS

Dubai Aerospace Enterprise's (DAE) acquisition of Irish lessor AWAS closed on 20 August 2017, with the Dubai-based lessor taking on aircraft assets of approximately $7.5 billion.

DAE's combined aircraft leasing division will operate under the name DAE Capital and will go to market from six locations: Dubai, Dublin, Singapore, Miami, New York and Bellevue, Washington. All of these are existing offices of DAE and AWAS, allowing DAE Capital to have technical, commercial and legal capabilities in these locations.

Simon Glass, the former chief financial officer (CFO) of AWAS, has been named the chief financial officer of DAE. Karl Griffin, the former chief operations officer (COO) of AWAS, has been named the COO of DAE Capital, the aircraft leasing division. Dan Stone, the former CFO of DAE Capital has assumed a newly created position of executive vice president responsible for managing and building the third-party asset management business. Firoz Tarapore, chief executive officer of DAE, tells *Airfinance Journal* that growing the lessor's third-party asset management business from under $1 billion today to $5 billion in the next three to five years will be one of DAE Capital's priorities. Tarapore also adds that DAE Capital's new senior management team is in place and operational as of today. On 24 July DAE priced $2.3 billion of senior notes as part of a three-tranche offering to help pay for its purchase AWAS. Morgan Stanley was the sole arranger of the transaction. Through its DAE Funding subsidiary, the lessor priced $500 million 4% notes due in 2020, $800 million 4.5% bonds due in 2022 and $1 billion 5% bonds due in 2024. The notes will be fully and unconditionally guaranteed by DAE.

DAE used a portion of the proceeds from this offering, along with cash on hand, to pay the cash purchase price for its previously announced acquisition of AWAS from private equity firm Terra Firma Capital Partners and the Canadian Pension Plan Investment Board.

Morgan Stanley acted as financial adviser and Freshfields Bruckhaus Deringer acted as legal adviser to DAE.

Still soaring after 50 years of aviation finance

Aviation finance is possibly as old as aviation itself. Aircraft are expensive pieces of machinery and it takes very deep pockets to purchase them with ready cash. Indeed, as far back as 1927 Charles Lindbergh's history-making solo transatlantic flight was underwritten by a group of American investors from the St Louis region.

But the highly complex and innovative aviation finance sector of today would almost have been an alien concept as recently as the 1960s. Up until then, the aviation sector was highly regulated and dominated by state-owned or state-backed flag-carrying airlines. Even the US market was dominated by a few major players who benefited from regulations that discouraged competition to the point of forbidding it.

Lindbergh takes off in the Spirit of St Louis from Roosevelt Field (Photo: *Underwood & Underwood*)

New aircraft purchases were made either with cash or bank borrowings, which, in many cases, were state guaranteed.

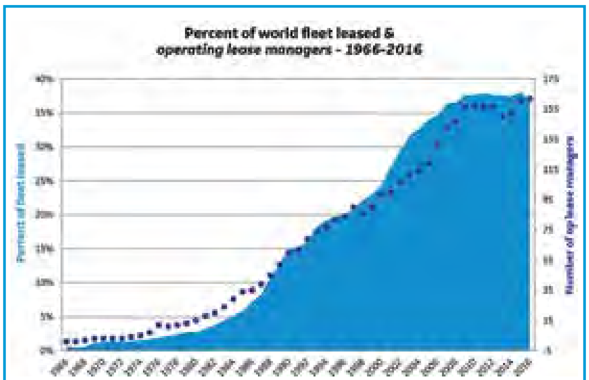
The winds of change began to blow quite strongly in the 1970s. First came the 1973 oil crisis in the wake of the Yom Kippur war in the Middle East. It drove up inflation and interest rates, plunged national budgets around the world into deficit and caused a severe downturn for the airline sector. Without the cash or the state guarantees for new aircraft purchases, the airlines had to start searching for new ways of financing them.

The deregulation effect

Oil shocks are temporary but deregulation is permanent. The US Airline Deregulation Act of 1978 blew away the old Civil Aeronautics Board, which had regulated the industry as a public utility, and ushered in a new wave of innovative airlines, which pioneered new routes, drove down prices and created a huge increase in demand for passenger aircraft which had to be paid for.

PanAm 747 in São Paulo 1991 shortly before the airline's bankruptcy and the closure of its operations (Photo: *Normando Carvalho, Jr*)

Ireland has a place in the deregulation story as well. Peter Sutherland, Ireland's European Commissioner from 1985 to 1989, held the competition portfolio in the European Commission and took a particular interest in anti-competitive practices in the aviation sector, which he believed were contrary to the EU's founding treaties.



Lessors now account for about 38% of the world fleet, with the number of operating lease lessors growing from one in 1965 to more than 150 today (Data: *Flight Global/Ascend*)

He intervened in the takeover of British Caledonian by British Airways, much to the displeasure of the UK government; he removed the power of governments to protect national carriers by blocking low fares and subsidising them with loan guarantees; and he is widely credited as being the father of the European Common Aviation Area – more commonly known as the Open Skies policy.

That too ushered in a wave of brash new entrants, including Ryanair, which collectively transformed irrevocably the face of European and global aviation.

Again, passenger numbers climbed and aircraft orders rose in step. And once again, financing had to be found.

The market for new forms of financing, to the airline sector at least, such as leasing began to grow quite dramatically. It may seem difficult to believe now, but as recently as 1980 only about 2% of the world's commercial aircraft was financed by leasing. That has grown to nearly two of five aircraft today, and some forecasters predict that it will increase to more than half by 2020. That could equate to between $50 billion and $60 billion of new leases annually.

GE Capital Aviation Services (GECAS), the commercial aircraft financing and leasing business of General Electric, has its roots dating back to the very beginning of that process when GECC Leasing Corp initiated its first aviation lease in 1967. Within a few years, GE Credit Corporation's Transportation & Industrial (T&I) platform led GE's aviation leasing. In 1986, GE Credit (today known as GE Capital) purchased the Polaris Aircraft Leasing Corporation, which was one of the United States' largest independent aircraft leasing companies.


Allegheny Airlines' DC 9-30 (N973VJ) was one of three aircraft that formed part of GE's first aircraft lease in 1967 (Photo, taken in August 1977, by mbernero)

The company has supported the aviation sector through two oil shocks, major recessions, massive disruption, and cycles of regulation and deregulation for the past 50 years. Today, GECAS is the world's largest aircraft lessor with a fleet of more than 1,950 – 1,639 fixed-wing and 313 rotary – aircraft in operation or on order along with collateralised loans on a further 400 or so aircraft.

The company is recognised as one of the pre-eminent commercial airline and helicopter leasing companies in the world, offering a wide range of aircraft types and financing options, including operating leases and secured debt financing. GECAS also provides an ever-expanding array of productivity solutions, including spare engine leasing, aviation consulting services, and spare parts financing and management.

Ireland's unique heritage

The fact that GECAS has its global headquarters in Shannon and Dublin is no accident of history. It is because of Ireland's unique place in the development of the aircraft-leasing sector. That too dates back to the 1973 oil shock.

This left the Irish flag carrier, Aer Lingus, with an acute problem – it had too many aircraft. A young executive named Tony Ryan, who had started as a baggage handler with the airline in the late 1950s, was given the unenviable task of solving the problem. He did it by arranging a then highly innovative wet lease with Thai airline Air Siam. It was also highly profitable.

Realising that there was a business opportunity to be exploited, Ryan persuaded Aer Lingus and London merchant bank Guinness Peat to back him in the establishment of a dedicated aircraft leasing company, Guinness Peat Aviation (GPA), in 1975. His two backers each held 45% stakes while, crucially, Ryan took a 10% holding and profit share rights.


GPA's founder Tony Ryan (Photo: *Liam Burke*)

GPA and its founder blazed a trail across the then still nascent aviation finance firmament and quickly established itself as the world's leading and most innovative lessor and eventually grew to become the largest by the end of the 1980s.

Ryan and his team proved remarkably resourceful and capable of operating in the most difficult markets with even more difficult clients. Its customers were among the world's most cash-strapped airlines in some of its most unstable economies. The GPA team was adept at moving aircraft onto alternative lessees when a client defaulted and was open to doing unorthodox deals in order to minimise bad debts.

"GPA didn't just grab a major slice of the global aircraft leasing industry, they played a major role in creating the industry and in writing the rules," says Sean Flannery, general manager, GECAS.

That key role in the sector's early growth and development has brought about a situation where today it is almost difficult to find a top industry executive who does not include at least some GPA experience on his or her CV.

It also turned Ireland into a wellspring of talent and knowledge for the industry. This, in turn, has spawned a vibrant aviation finance sector in Dublin, and the city is now widely acknowledged as a leading global hub for the industry with 14 of the world's top 15 aircraft lessors having a presence in the city.

GPA House, Shannon, Ireland

It is generally acknowledged that GPA was the mother lode that led to all these businesses establishing in Ireland, but other factors have been at play as well. The Irish government was quick to respond to the new industry and it put in place the right corporate legal structures early on.

The quality support services available from professional services firms have also been crucial. Because of their work with GPA in the days when the rules were just being written, they have developed skillsets and expertise that are better than or at least equal to the best to be found anywhere else in the world.

The Irish Aviation Authority has also played its role by being generally helpful to lessors and allowing aircraft operating in certain parts of the world to be registered in Ireland.


Shannon Airport and Free Zone (Photo: *Shannon IASC*)

The robust legal environment in Ireland, which generally provides protection to lenders and other creditors, is another strength. That environment includes Ireland's position as a contracting state under the Cape Town Convention, as well as the location of the International Registry in Dublin.

GPA in reverse

GPA was firmly established as the world's leading aircraft lessor by the time the first Gulf War broke out in early 1991. This had a severe impact on the global economy and GPA was among the casualties.

The global credit squeeze triggered by the invasion of Kuwait by Iraq and the subsequent Gulf War caught GPA in a perilously vulnerable position. The company had 240 aircraft out on lease to almost 70 airlines around the world but it was hugely dependent on short-term bank debt despite a significantly widened shareholder base.

The company had little choice but to go for an initial public offering in 1992 despite the inauspicious timing. Lack of investor support forced the abandonment of the flotation and GPA was unable to meet a number of important debt covenants.

Enter GECAS

This is when GE entered the frame. While its underlying leasing business was essentially sound and definitely profitable, GPA still faced imminent bankruptcy. GE was initially interested in acquiring some GPA assets with options on others. This was not an attractive proposition for the group of banks holding GPA's debt, however.

In a complex deal, which reflected the innovative culture of both companies, GE Capital established a new subsidiary, GECAS, to manage GPA's assets. GECAS acquired 44 of GPA's 464 aircraft outright for $1.3 billion. It also acquired an option to buy a majority stake in GPA. Under the deal, GECAS got GPA's remarketing team, its world leading IT aircraft tracking systems, a portfolio of aircraft and a service agreement to manage the remaining assets it had not acquired. This last element of the deal saw GPA's critically important asset management team move over to GECAS.

Ultimately, what the deal entailed was an amalgamation of GE's T&I Aviation Group, Polaris Aircraft Leasing and the most valuable elements of GPA. The result was an exceptionally strong company, which combined the high-quality technical skills, experience and agility of the GPA team with GE's hallmark risk underwriting and balance sheet management discipline.

GE Capital
Aviation Services

GECAS logo circa 1993

The new business hit the ground running and was quickly established as the pre-eminent player globally. By the mid-1990s, it owned 445 aircraft and was managing an additional 430 on behalf of investors. This scale combined with its best-in-class capability allowed it to make a major statement of intent to the market with a massive order for more than $6 billion-worth of Boeing and Airbus narrowbodied jets.

Growth and innovation

This was followed by a decade-long period of growth and diversification. In 1999, it moved into the engine lease business, and the acquisition of PK AirFinance the following year saw GECAS move into aircraft lending.

GE90 engine on Boeing 777-300ER (Photo: *Jeerapan Jankaew/Shutterstock*)

A full range of spare engine solutions are now offered to customers worldwide. These include short-term rentals from days to months, operating leases, engine sale and leaseback and structured long-term financing, engine exchanges, and engine asset management and marketing services. PK AirFinance offers secured senior and junior loans for aircraft and engines to airlines and investors.

In 2000, the company moved into the regional jet space and into widebodies with its first order for Boeing 777s. GECAS moved into freighter conversion in 2002, while the acquisition of The Memphis Group in 2006 added airframe parts to its service portfolio. Aviation consulting was added through the acquisition of AviaSolutions in 2010.

The Memphis Group acquisition represented a strategic expansion for GECAS. Memphis was one of the world's largest aircraft dismantling and parts trading companies at the time and GECAS recognized the advantages of having such a division to offer full lifecycle management of aircraft assets.

GECAS' AMS (formerly The Memphis Group) Greenwood, Mississippi, Dismantling Facility (Photo: *Jay Adkins*)

It is estimated that up to 70% of an end-of-life aircraft can be recycled and the Tennessee-based business gives GECAS access to a valuable revenue stream.

Airbus H225 (Photo: *Airbus SAS*)

More recently, the acquisition of Milestone Aviation saw GECAS move into helicopter finance and leasing for the first time. Milestone offers operating lease financing to helicopter operators in 25 countries on six continents. Its current fleet of about 240 helicopters is used in the offshore oil and gas industries, search and rescue, emergency medical services, police surveillance, mining and other utility missions. The division has a forward orderbook of medium and heavy helicopter models from AgustaWestland, Airbus and Sikorsky available for lease to customers.

Geographic expansion has been no less impressive than the growth in the service portfolio. From a position where the company had operations in the US and Ireland, it has grown to 26 offices with more than 250 customers in over 75 countries worldwide.

GECAS' offices in Dubai

Financial innovation

While the industry is commonly referred to as aircraft leasing, it has long since moved beyond that narrow form of finance and GECAS has been at the very heart of those changes over the years. The choice and availability of aircraft finance ultimately depends on the airline involved, but it is up to the industry to provide what they require or prefer.

For example, recently established airlines and certain low-cost carriers will favour leasing an aircraft under an operating lease and, indeed, it can sometimes be their only option. Other airlines with strong credit ratings may prefer to raise cheaper debt financing available from the capital markets and use this to acquire aircraft outright. It is also reasonably common to see airlines adopt a diversified funding strategy with at least a portion of the total fleet leased under operating lease.

Low-cost carriers Southwest Airlines, a 737, and Jetblue, with an A320 (Photo: *Tomás Del Coro*)

Low-cost carriers AirAsia and Lion Air in Thailand (Photo: *Jeerapan Jankaew-Shutterstock*)

This has seen aircraft lessors getting involved in the creation of asset-backed securities with bundled leases being packaged and sold onto investors in order to fund further purchases. The combination of good aircraft and top-tier airline customers makes these securities very attractive to investors in the current climate.

In Ireland, this increased capital markets activity has led to the establishment of more aircraft platforms and the holding of more aircraft assets in Irish companies. This has been aided by the Section 110 regime and the utilisation of Cayman-incorporated Irish tax-resident vehicles, which facilitate the efficient structuring and delivery of securitisation transactions for certain asset classes and is recognized as one of the leading regimes in the EU.

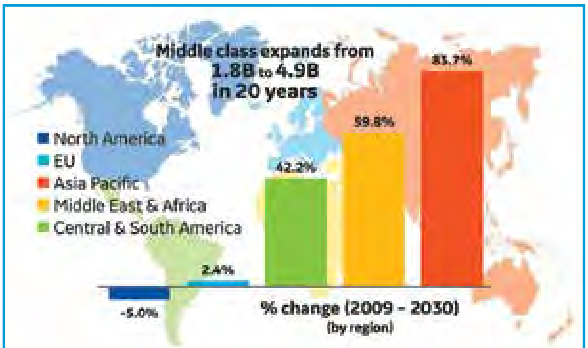
In fact, Ireland is now one of the leading jurisdictions for the structuring of aviation securitisations and the full range of aviation finance products, and GECAS, with its full suite of financing options, including leasing, structured deals, secured debt and capital markets, has played a central role in that achievement.

Growth prospects

The growth of the aircraft finance sector over the next 20 years is set to be staggering, with some commentators estimating that there will be between five and six trillion dollars'-worth of aircraft sales over the period. And that's just new aircraft. There will also be an enormous amount of business done in the leasing and selling on of the older aircraft being replaced.

A significant proportion of the growth will come from East Asia, notwithstanding some recent softening in the pace of expansion of the Chinese and Asian economies. The expanding middle class in Asia will have a compounding effect on demand for air travel. According to some estimates, more than one-third of all new aircraft delivered over the next two decades will go to airlines in Asia.

China alone is a fertile country for growth, with dozens of new airports planned and passenger numbers expected to grow to 1.3 billion annually over the coming 20 years. India is also growing rapidly, with domestic air travel experiencing double-digit growth at present.



A rapidly expanding middle class in Asia, Africa and the Middle East will expand demand for air travel (Data: *OECD*)

The International Air Transport Association (IATA) forecasts India to be number three in the world by 2025, up from sixth at present. Strongest demand is currently in the US, China and the UK but by 2025 it will be China, the US and India in that order, according to IATA.

Overall growth in passenger numbers in Asia is also very significant with 100 million people becoming air travellers each year. There is also strong growth in Africa, albeit from a low base, but it is expected to double in size over the next decade.

Meanwhile, there is strong demand in mature western countries for replacement aircraft with 747s having been replaced by 777s, while next-generation quieter, more fuel-efficient jets will be the order of the day for airlines.

Wider ambitions

With its global reach and established relationships with customers worldwide, GECAS is well positioned to take advantage of these growth trends. Indeed, simply maintaining its share of global aviation finance would see GECAS continue to grow at a very healthy rate but the company's ambitions extend beyond that.

In some cases, realising these ambitions will see the company benefit from existing GE sectoral and industry linkages. This will offer synergies where GECAS financing helps its industrial parent company while the parent company's reach brings GECAS into new areas.

This was the case with helicopters, with GE manufacturing turboshafts for three of the engine platforms powering heavy and medium helicopters.

Regional aircraft represent another segment for GECAS.

These aircraft play a vital role for many airlines in retaining service in smaller markets and offering point-to-point service. The GECAS leased fleet includes 300 Bombardier and Embraer aircraft as well as new ATR turboprops and Bombardier Q400s.

Air Canada Embraer E-190 (Photo: *Makaristos*)

The company also retains its leadership position in airfreight and, two years ago, announced the industry's first Boeing 737-800 passenger-to-freighter conversion programme.

"There is significant demand from customers for a modern narrowbody freighter both in terms of adding new cargo capacity and for replacement of older models," says Chris Damianos, GECAS' executive vice-president and manager specialty markets, adding: "The high operating costs of older narrowbody freighters along with noise and other regulatory requirements are driving strong demand for replacements. The conversion programme continues our leadership in leased freighters."

This half-century history of growth and innovation has seen GECAS emerge to become a full lifecycle provider in the aviation finance space. Its global footprint and local presence combined with its fleet of narrowbody, widebody, regional, and air cargo aircraft and helicopters, its suite of financing options from leasing through structured deals, secured debt to capital markets, and its range of industry leading services such as engine leasing, spare parts, airport and airline consulting, and technical operations make GECAS strongly positioned to take advantage of new growth opportunities as they arise in the coming years.

And in a major vote of confidence in the future, in June, GECAS announced a firm order for 100 Airbus A320neo family aircraft, bringing the total number of A320 family aircraft ordered by GECAS to about 600. In addition, the company announced an order for 20 of the new 737 Max 10 aircraft from Boeing by converting 20 of its current Max orders to the larger Max 10, which was launched at the Paris air show.

"This Max 10 order further enhances our fleet with the newest technology, offering our customers commonality along with increased range and available seating," says Alec Burger, president and chief executive officer of GECAS. "Combining the increased capacity of the Max 10 and the CFM International LEAP-1B engines offers our customers many benefits," he adds. This brings to 170 the number of Max aircraft GECAS has on order, the largest of any aircraft leasing company.

For the immediate future, GECAS believes a joint-venture approach will help it drive growth, and it recently announced the establishment of a $2 billion global aircraft financing platform with Caisse de dépôt et placement du Québec (CDPQ).

"We want to be part of the industry growth, but there is no reason why we have to have 100% of every deal invested," explains Burger. "Why not have something less than that and attract somebody to invest some of their money alongside us in a structured vehicle?"

737 MAX 10 with CFM LEAP-1B engines (Photo by *Boeing*)

The new platform with CDPQ, known as Einn Volant Aircraft Leasing (EVAL), will be involved in the acquisition of modern fuel-efficient aircraft from a diverse set of global airlines and in leasing them back to such airlines under long-term leases. GECAS will source the transactions and, under a sistership arrangement under certain conditions, will invest in aircraft ownership opportunities alongside the platform to align its interests further with those of EVAL. GECAS will also act as servicer for the platform.

EVAL will provide GECAS with the flexibility to finance growth and opportunities, while serving as an entry point for CDPQ into the aircraft leasing and financing industry. In addition, it represents a key step in the expansion of the strategic relationship between GE and CDPQ, which has been built over several years.

"This platform will enable continued growth and development of our global customer relationships," says Burger. "We are delighted CDPQ will be our strategic partner in this exciting venture, which is a natural expansion of the relationship between the highly regarded pension fund manager and GE," he adds.

This willingness to explore new business opportunities and new financing models has characterised GECAS throughout the past half century. The company began life when aircraft leasing was an almost unknown concept to the great majority of the world's airlines, and continued growth and innovation since then has seen GECAS emerge to become the world's only full lifecycle provider in the aviation finance space.

Its global footprint and local presence combined with its fleet of narrowbody, widebody, regional, and air cargo aircraft and helicopters, its suite of financing options from leasing through structured deals, secured debt to capital markets, and its range of industry-leading services, such as engine leasing, spare parts, airport and airline consulting, and technical operations, make GECAS uniquely well positioned to take advantage of new growth opportunities as they arise in the coming years.

Blockchain – a game changer in aircraft leasing?

By Lory Kehoe, director, EMEA Blockchain Lab lead, Deloitte Ireland, and John Hallahan, consultant, EMEA Blockchain Lab, Deloitte Ireland.

The aircraft leasing industry is one of the fastest-growing industries globally. A number of factors have resulted in this growth, including but not limited to, a year-on-year increase in passenger traffic, the rise of low-cost carriers (LCC) and the growth of the APAC market[1].

Given the nature of this capital-intensive industry, it is interesting to note some of the antiquated systems and practices, which are still commonplace. For example, the maintenance of an aircraft is a process that uses cumbersome databases at best and, at worst, a paper-based system prone to losses and errors throughout.

With the rapid rise of digital technologies in other industries, it seems only a matter of time until the aircraft leasing game is affected. To that end, this article will explore the potential benefits of adopting Blockchain technology in the aircraft leasing industry and assess a number of potential use cases, which have a truly disruptive potential for all stakeholders involved.

Lory Kehoe, director, EMEA Blockchain Lab lead, Deloitte Ireland

What is Blockchain?

Blockchain is perhaps the biggest buzzword in the technology landscape today. Put at its simplest: a blockchain is a distributed ledger that provides a way for information to be shared and recorded by a community (DUP[2]).

A major characteristic of blockchain is that every member of the network maintains a full copy of the information and there must be a consensus of all members to validate any new update to the ledger. The information stored can relate to any digital form of information as, for example, but not limited to, transactions, digital assets, digital identities and even contracts. Each new block of information is then added to the chain.

The revolutionary aspect of blockchain, resulting from its distributed nature, is that each transaction can be accessed by the whole network. Therefore, there is the possibility of every party being able to view every transaction in the history of the network. With cryptographic algorithms validating how transactions are bundled into blocks and how blocks are added (consensus), the integrity and immutability of the network is ensured. If any one party tries to defraud or change the ledger, the network will see their copy is not valid and reject it.

This particular point is important to note, because this allows the blockchain to replace trusted middlemen with a mathematic algorithm, which can perform the same job for a fraction of the cost and in a much quicker time. The trust in this system comes from its cryptography, which underpins its very core.

It is also prudent to note at this point that there are two main types of Blockchain systems: permissionless and permissioned[3].

1. **Permissionless** – a permissionless system is one where anyone can join the network and participate fully in the network – eg, read and write any transaction. It is also known as a public network. The best example of a permissionless blockchain is the Bitcoin blockchain, which underlies the world's most famous cryptocurrency, Bitcoin.
2. **Permissioned** – a permissioned network is one in which permission needs to be given to perform certain tasks. For example, permission may be needed to read certain transactions, it may limit who you can deal with and it may also state who can add and validate blocks to the chain. An example of a permissioned blockchain network is Ripple, where Ripple determines the scope and role of the users on the system.

[1] *Carroll P (16 Jan 2017). Irish aircraft leasing sector gears up for surge based on Asia growth. Available at: http://www.independent.ie/business/irish/irish-aircraft-leasing-sector-gears-up-for-surge-based-on-asia-growth-35369814.html*
[2] *Piscini P, Guasetella J, Rozman A and Nassim T (24 Feb 2016). Blockchain: Democratised trust. Available at: https://dupress.deloitte.com/dup-us-en/focus/tech-trends/2016/blockchain-applications-and-trust-in-a-global-economy.html*
[3] *Bauerie N (2016). What is the Difference between Public and Permissioned Blockchains? Available at: https://www.coindesk.com/information/what-is-the-difference-between-open-and-permissioned-blockchains/*

We see a number of key blockchain characteristics that could be of real benefit to the aircraft leasing industry if utilised in the correct manner. They are:

- **data integrity** – the immutable nature of a blockchain allows for a greater certainty of data quality than normal database technologies. The underlying cryptography, coupled with the decentralised nature of the technology, makes it practically impossible to modify the data on the chain, or even hack the system. This could prove crucial in the tracking of aircraft parts or even in the fulfilling of obligations of a lease, (cybersecurity article)[4];
- **trust** – a blockchain is an immutable source of truth, providing a single source of the information recorded and validated in the network. Given the disparate and often antiquated database systems used in the aircraft leasing industry, a blockchain could provide the single source of truth for an aircraft or fleet that could be a game changer for a number of tasks which we will discuss later;
- **smart contracts** – a core feature of blockchain is that of smart contracts. Put simply, a smart contract is a computer programme which can be used to facilitate, verify or enforce rules between two parties. For example, after x number hours of use, an aircraft engine needs to undergo maintenance. When this figure is about to be reached, a smart contract could notify the maintenance provider and schedule such an appointment; and
- **additional capabilities** – while the above three points are a flavour of what the blockchain can do, there are a number of other technologies in the ecosystem which can complement the blockchain. For example, the Inter Planetary File System (IPFS) is a layer that sits on top of the Blockchain, allowing for increased storage capabilities – eg, lease or financing contracts could be stored here. IoT and blockchain can also work well together to create an immutable record of all the data with regards to a particular asset.

Lory Kehoe, director at Deloitte and EMEA Blockchain Lab lead, is bullish on the technology and believes these characteristics are a clear reason the technology is here to stay.

"People are still sceptical about whether blockchain will take off. We at Deloitte are firmly of the opinion that the inflection point is just around the corner and that our clients will need to be prepared to take full advantage of this truly exponential technology."

Potential use cases – assessing the potential of blockchain

While there are a number of different use cases, which could prove applicable in the aircraft leasing space, for the purposes of this article we will focus on three. They are: 1) a blockchain system for tracking aircraft maintenance; 2) the creation of aircraft coins/tokens to eliminate inherent risks for airlines and lessors; and 3) AirChain, a one-stop shop for all stakeholders in the leasing ecosystem.

1. Blockchain for aircraft maintenance

The lifetime of a commercial aircraft can be up to 30 years, which means it may pass through five or six owners before it is decommissioned. Given this level of activity and transfer of ownership, the tracking and tracing of information relating to this aircraft can prove to be an arduous process. This is particularly clear when it comes to the maintenance documents associated with the aircraft.

John Maggiore of Boeing contends 90% of all of these maintenance records are paper-based, with "literally millions of boxes of paper-based documents"[5].

It is easy to understand that this system can have a number of drawbacks. First, having paper-based documents leads to the risk of loss or potentially fraud. The American Airlines case in 2015 was proof that fraud in maintenance can still be an issue[6].

Furthermore, Rudy Byrce of GE Aviation notes that there are frequently paperwork issues when the time comes to evaluate the assets[7]. For example, engines can generate thousands of pages of documents. This is a concern as older aircraft have no chance of having a digital copy.

Second, when it comes to due diligence, all of these records, whether paper-based or scanned copies, will need to be fully evaluated because of the lack of smart characteristics. Even in the current digital systems used for newer aircraft, this can prove a time-consuming task.

When looking at the role blockchain has played in helping to digitise the trade finance process, we can see projects underway; with the likes of the Hong Kong Monetary Authority and state bodies in Dubai to name two, we can see the potential benefit blockchain could play here.

An immutable record of the maintenance history of an aircraft is clearly of benefit to the stakeholders in the leasing community. Any issues arising can be clearly traced to a timestamped record of who performed an inspection and when, meaning a full audit trail in the event of an investigation. Furthermore, there is the potential, by having this single system, to speed up the due diligence process in releasing an aircraft. It could be as simple as scanning a QR code on an engine to see the full history of the asset.

Why stop here? We see companies such as Boeing testing blockchain technology to track not only the maintenance of an asset, but also its whole lifecycle[8].

Similarly, Airbus has discussed how blockchain could be used in supply chain tracking. By using blockchain to underpin the Internet of Things, we can see the potential of two disruptive technologies working in unison to digitise and future proof a difficult process for original equipment manufacturers (OEMs), lessors and airlines.

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[4] *Piscini E, Dalton D and Kehoe L (2017). Blockchain & Cyber Security. Let's Discuss. Available at: file:///C:/Users/jhallahan/Downloads/IE_C_BlockchainandCyberPOV_0417%20(2).pdf*
[5] *Seidenman P and Spanovich D (2016). Why Airlines, Aftermarket Struggle With Digital Record Keeping. Available at: http://aviationweek.com/connected-aerospace/why-airlines-aftermarket-struggle-digital-record-keeping*
[6] *Goglia J (2015). FAA Investigation Substantiates Mechanics Safety Complaint Against American Airlines. Available at: https://www.forbes.com/sites/johngoglia/2015/05/01/faa-investigation-substantiates-mechanics-safety-complaint-against-american-airlines/#3eb7bffa2a95*
[7] *Goglia J (2015). FAA Investigation Substantiates Mechanics Safety Complaint Against American Airlines. Available at: https://www.forbes.com/sites/johngoglia/2015/05/01/faa-investigation-substantiates-mechanics-safety-complaint-against-american-airlines/#3eb7bffa2a95*
[8] *Gutierrez C (2017). Boeing Improves Operations with Blockchain and the Internet of Things. Available at: https://www.altoros.com/blog/boeing-improves-operations-with-blockchain-and-the-internet-of-things/*

2. Aircraft coins/tokens

The aircraft leasing industry is one of the most-capital intensive industries in the world. Foreign exchange (FX) risk has long been a problem in the aircraft-leasing industry. Granted, this is mainly an issue for airlines, many of which pay for leases and costs in US dollars but make profits in their native currency.

While less of an issue for lessors, any potential interest rate hikes for the US dollar would cause similar impacts to the industry. Furthermore, Basel IV reforms are threatening to increase the amount of cash, which banks must provide against the risk of an airline defaulting on repayments to lessors[9]. While the impact is still to be properly assessed, this could feasibly add to the premiums already paid for leases.

A potential solution to these issues is using cryptocurrencies or tokens to settle transactions between the parties in the aircraft leasing ecosystem. We see a similar initiative underway in financial services with the Utility Settlement Coin[10]. This coin is exploring the potential to create a digital cash system, which can facilitate interbank payments without the need for third parties such as clearing houses which add time and costs to the process.

We can see the potential of OEMs creating a number of coins based in different currencies. Boeing could enable payment with custom cryptocurrencies to enable on-chain foreign exchange (FX) payments with the banking system being used purely as an off-chain periodic settlement layer. Boeing could set the price for an aircraft and the lessor would still be in charge of the paperwork and leasing to the airlines. The lessor would benefit in this scenario by being able to operate in multiple digital currencies with different airlines. Airlines would benefit by being able to operate in digital currencies, which forgoes most of their FX risk.

In the future, if the digital currencies take off and are widely accepted and traded, there is the potential to settle transactions between the ecosystem players without the need for banks being involved in the process. This would be possible by the aviation financer being able to fund the acquisition cost in the digital currency rather than fiat currency. While this idea may seem farfetched to ecosystem players in leasing currently, the rise of Bitcoin has shown that, in the long term, digital currencies have the potential to disrupt the way parties transact with each other.

3. AirChain – a new ecosystem for aircraft leasing

While the first two use cases focus on specific applications and tasks within the aircraft-leasing industry, our third use case looks at the art of the possible with regards to the use of blockchain technology in aircraft leasing.

Many of the tasks and operations, which take place currently – including, maintenance, transfer of title, lease repayments, exchange of value – all happen in siloes. In many cases, it is difficult for any single party in the ecosystem to have a holistic view of their operations. While blockchain is lauded for its ability to streamline and digitise, it can also have a positive impact on industries by potentially creating new revenue streams and operating models.


John Hallahan, consultant, EMEA Blockchain Lab, Deloitte Ireland

Here we introduce the idea of AirChain – a future system for all ecosystem players in the aviation leasing industry. This private chain would be accessible by all of the stakeholders in the industry, with varying levels of access for each. On the chain, a number of activities could take place. As an immutable data store for aircraft information, the tracking of an asset mentioned in use case 1 could take place.

Furthermore, as lessors and airlines are on the system, smart contracts could be used to automate lease and title exchange. This exchange can be facilitated by what we call "tokenising" the asset, creating a digital token, which represents a physical asset – ie, an aircraft, engine or a part. This token can then be transferred in exchange for a digital currency, like the one we have mentioned in use case 2.

There is also the ability to implement what we call "side chains". A side chain is another blockchain which could interoperate with AirChain, which, in this case, would be called the main chain. This side chain would be the single data store for all of the interactions with a single aircraft. By storing the information in the side chain, the main chain would simply contain a reference (or hash) of the information in the side chain. This is crucial because it means the main chain in the system is not overloaded with information on every aircraft. Having a separate chain for each aircraft would also allow for an analytics layer to sit on top and aggregate fleet information for a particular airline or OEM, which could be shared back in a dashboard format.

A further benefit of having a chain for each aircraft would be to allow certain parties to have read or write access. For example, a maintenance, repair and overhaul company could be given read and write access to document its findings to the chain, whereas a regulator could be given only read access to view the information relating to an aircraft.

[9] O'Halloran (2016). New banking rules could spell problems for aircraft leasing. Available at: http://www.irishtimes.com/business/financial-services/new-banking-rules-could-spell-problems-for-aircraft-leasing-1.2848746

[10] De Meijer CRW (2017). UBS and the Utility Settlement Coin. Available at: https://www.finextra.com/blogposting/14459/ubs-and-the-utility-settlement-coin

Potential barriers to adoption

While the above use cases work well in theory, based on our experience there may be a number of barriers to blockchain being adopted which we outline below:

- **network effect** – as discussed previously, blockchain is a network-based technology. To operate industry-wide platforms, there is a need for a majority of market participants to join to realise the value and potential that such a system could provide. A concern for a system such as AirChain would be that a critical mass is not reached and that the system fails. However, on the flip side of this, by starting with a small number of companies and realising the value between only a small number of parties, it could be assumed others would join to reap the benefits of the platform;
- **legal uncertainty** – as blockchain is in the early stages of its development, it is still unclear how the technology will be treated by regulators. In the aviation space, there would need to be a concerted by-in from the likes of the European Aviation Safety Agency and the Federal Aviation Administration in the US early on in the process. Furthermore, the validity and legal enforceability of smart contracts is still unclear, and any move to use them in a global system would need to be carefully considered;
- **reluctance of ecosystem players to adopt blockchain** – it is important to assess the benefits for all parties involved in any future state use cases or platforms. For example, would aircraft leasing companies want to share all of their information? Concessions could be made in the system to allow only lessors permission to access the information they want potential customers to see. This is where the governance and operating model of any potential platform becomes a crucial task; and
- **technology concerns** – the core concept of blockchain is still in its early stages. Although it is already possible to leverage the capabilities of this distributed network, advancements in functionality and usability are still to come. Furthermore, there are also concerns regarding the immutability of data in such a system. New regulations, such as the General Data Protection Regulation, will impact how blockchain-like systems are implemented and treated. As such, it is important to take this into consideration when thinking about building blockchain platforms. Last, but not least, governance models related to IT practices will change. The current lifecycle of software needs to be tweaked when considering blockchain: who owns the data, who is in charge of modifying the underlying code, which teams control package deployment and bug fixing in such a system? These are all important questions to take into consideration.

Next steps

So what is next on the blockchain journey? What is clear is that the aircraft-leasing industry appears to be behind the likes of banking, where pilot and production projects are beginning to emerge, such as the aforementioned Utility Settlement Coin and trade finance projects. However, Boeing and Airbus have been active in this space and are beginning to move from what we call the education phase into the testing phase. We also see airlines beginning to test the technology – for example, the start-up Loyyal is beginning to test blockchain technology for loyalty programmes[11].

For lessors, this is the time to begin exploring the technology. As David Dalton, Deloitte EMEA Blockchain Lab Sponsoring Partner notes: "Blockchain is not just a technology that can help digitise many aspects of the airline industry but also create new revenue streams and business models. Early innovators with Blockchain will capture value ahead of their competitors." We would recommend the following steps to ensuring you are not left behind by this ground-breaking technology:

- upskill some technical staff on the technology;
- assess what your competitors are doing in this space;
- talk to your customers about what they are doing in the blockchain space;
- identify the use cases which align with your long-term goals; and
- test the technology with an internal proof of concept.

The future powered by blockchain is closer than many think and now is the time to begin testing the technology and identifying the use cases which could have a long-term positive impact on your business. Given the exponential nature of this technology, the inflection curve may come sooner rather than later, and those who are best placed to capitalise will reap the benefits for many years to come. Now is the time, be ready.

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[11] *Rizzo P (2017). 2020 Vision: Why Start-ups Believe Blockchain Will Go Live in Dubai. Available at: https://www.finextra.com/blogposting/14459/ubs-and-the-utility-settlement-coin*

Aviation in India today

By: Nimish Vakil and Sneha Rao

India is the ninth-largest civil aviation market in the world, comprising seven scheduled operators flying about 500 aircraft (which include Boeing, Airbus, ATR, Bombardier and Embraer types), more than a 100 non-scheduled operators, which account for about 350 aircraft (which include models from Airbus, Dassault, Bombardier, Augusta Westland, Bell, Gulfstream and Beechcraft) and a large number of privately operated aircraft.

India stands out as one of the major players in the aviation industry in Asia, with a total of about 1,680 aircraft registered with the Indian aviation authority, the Directorate General of Civil Aviation in New Delhi. The aircraft referred to include passenger and cargo, jet and propeller, fixed-wing and rotary wing aircraft.

Of the seven scheduled domestic operators, the four major airlines (Indigo, Jet Airways, Air India and Spicejet) have a market share of about 84%, with Indigo leading the way on 40%. Published data for the domestic operators during the seven-month period between January and July 2017 shows the total number of passengers travelled at 65.7 million.

Published data for international routes operated by the four scheduled international operators (Air India, Jet Airways, Indigo and Spicejet) in 2016 show a combined market share of 34.2%, with Air India leading at 16.7%.

Having reported an annual growth rate of between 16% and 18% for the past couple of years, this industry has witnessed an increasing interest not only from foreign entities such as manufacturers, leasing companies and financiers, but also from domestic quarters such as Indian entrepreneurs and the government.

The National Civil Aviation Policy 2016, which was approved by the union cabinet on 15 June 2016, focuses on making domestic air travel affordable and convenient by boosting regional connectivity through the introduction of a new regional connectivity scheme (RCS). Under RCS, fares are capped at INR2,500 ($39) on RCS routes for a flight lasting for about one hour. The government is looking at effectively implementing the RCS through

Nimish Vakil

Sneha Rao

fiscal support by way of concession in applicable taxes and charges, infrastructure development and provision of utilities and services either free of cost or at concessional rates.

With the objective of providing a level playing field for both the new as well as the established airlines as far as international operations are concerned, the requirement that Indian carriers must fly on domestic routes for five years and have a fleet of at least 20 aircraft before they can commence international operations has been modified by the National Policy of 2016. Now, all airlines can commence international operations provided that they deploy 20 aircraft or 20% of their total capacity (in terms of the average number of seats on all departures combined), whichever is higher, for domestic operations.

Certain provisions of the (Indian) Aircraft Rules, 1937, were amended in February 2015 and again in October 2016 recognising the rights of an IDERA holder under the Cape Town Convention and consequentially stipulating a fixed period of time within which the deregistration should take place facilitating export of the aircraft. Although practical difficulties on the ground prevent a smooth process for deregistration, court judgments and statutory amendments in the recent past have begun positively laying the basis for precedents going forward.

The government set the ball rolling in June 2017 and initiated steps to disinvest in the national carrier, Air India. This is also to include Air India's three profit-making subsidiaries – Air India Express (its low-fare international carrier), AI Transport Services (its ground handling Unit) and AI-SATS (a 50-50 ground handling joint venture with Singapore Airport Terminal Services).

In September 2017, it was reported that the "Fifth Freedom of the Air" – Long Haul Low Cost – is likely to make its debut in India in a year's time. This would allow a carrier to operate direct flights between two foreign countries. If Low Cost Carriers (LCCs) such as Indigo and Spicejet continue to delay launching long haul low cost international flights, foreign LCCs will soon grab the international routes under the privilege of fifth freedom rights that they have between India and other foreign destinations such as in Europe.

India has as many as 450 airports, of which 125 are government owned, with the remainder privately managed. Until 2013, the government, through the Airport Authority of India, was in charge of developing and upgrading airports. However, post-liberalisation, private players have participated in developing (both brownfield and greenfield) airport projects. Today, almost all major city airports have been upgraded through private participation.

The increase in the growth of this industry together with the recent trends in the fall in oil prices and the resultant decrease in the cost of operations has prompted the private operators to expand their operations. This has resulted in an acute shortage of experienced pilots. The difficulties faced by Indian airlines in employing foreign pilots because of the pressure of labour unions and restrictions on poaching by competitors have only compounded the problem.

Despite a passage of nearly 25 years since the Indian skies were thrown open to private operators, this industry still finds itself searching. Several large private operators, such as Kingfisher Airlines, which at its peak had as many as 96 aircraft, have folded after years of operations. On the other hand, smaller carriers continue to spring up and disappear after barely a year of operations. Permitting foreign investment in Indian private operators has attracted only one overseas airline, Etihad, to invest in Jet Airways.

One of the most important issues that needs to be addressed is the introduction of new legislation in view of the changing times relating specifically to the Cape Town Convention to which India is a signatory and which was ratified by India in 2008.

With the large number of aircraft flying in India and with almost 800 on order from private operators, the airlines are going to find themselves in turbulent weather if infrastructure growth does not keep pace with the ever-increasing demand in traffic and expansion of the airlines in India. The encouragement of private sector participation in the operation of airlines, as well as the development of infrastructure backed by governmental support through deregulation for ease of doing business, is a positive step in this direction.

Iberia Maintenance – a business in constant transformation

As a leading airline maintenance provider with over 2,600 highly-skilled employees, Iberia Maintenance is specialized in providing MRO services to Airbus operators.

Avión en La Muñoza: Iberia Maintenance facilities near Madrid airport

From its two main operational bases in Madrid and Barcelona, as well as an extensive network of line maintenance stations, the MRO division of Iberia furnishes its customers with a full spectrum of services ranging from single maintenance events to fully integrated service solutions across A320, A330 and A340 aircraft platforms, as well as CFM56-5A/1-5B, CFM56-7B, V2500 and RB211-535E4 aircraft engines. In the past few years, Iberia Maintenance has undergone a comprehensive reorganization aimed at assuring its customers service of the highest quality and maximum efficiency. It is currently preparing to welcome the new Airbus A350 as well as the A320 NEO, which will be incorporated into its parent company's fleet in 2018.

Everyone in Iberia Maintenance understands that the customer is its raison d'être, and that its key mission as a provider of MRO services is to create value for the airlines and other customers who use its services. "We have modified all our procedures to reflect this absolute focus on our customers. Iberia Maintenance is all about adapting our business to the changing circumstances of an increasingly competitive MRO market," says André Wall, who joined Iberia as Chief Technical Officer in February 2016. Wall's previous experience in the aircraft maintenance business and also in guiding the transformation of businesses by means of the simplification of design and production processes have been key to the process of change at Iberia Maintenance since his appointment.

Transform to Compete

In the past few years, in parallel to the parent airline's own deep restructuring and successful bid to increase productivity, Iberia Maintenance has undergone a wide ranging transformation.

As part of Iberia, Spain's leading airline which is celebrating its 90th anniversary this year, and is now a member of the International Airlines Group (IAG), Iberia Maintenance faced the challenge of renewing itself comprehensively to effect a return to profitability through cost reduction, as well as maximizing simplicity and flexibility. The company has therefore increased its productivity and improved its competitive position.

The transformation of Iberia Maintenance, Spain's number-one MRO provider, involved the most rigorous application of the "Lean" philosophy –creating more

DSC0259: Iberia Maintenance engine workshop is specialised on CFM56-5A/1-5B, CFM56-7B, V2500 and RB211-535E4 engines

value for customers with fewer resources and zero waste– in order to become more efficient and more competitive through ongoing efforts to simplify and improve all processes, while stressing teamwork and the recognition of employees' successes and excellent performance.

"We are working to become the true partner of choice for our customers and to provide them with unique and differentiated service solutions developed from deep customer understanding, effective relationships, and world-class performance" – comments Wall – "Our mottos are 'Fly Safe, Fly on Time, Fly@LowCost', and 'Feel the Innovation and Continuous Improvement'".

With these four pillars in mind, Iberia Maintenance hammered out new agreements with its employees' union representatives which led to a dramatic increase in productivity, thanks especially to the new provisions regarding workforce flexibility.

For its part, the company made significant new investments both in staff training and in upgrading its equipment and tools, which brought immediate improvements to such activities as the line maintenance carried out in Madrid and other airports.

The maintenance unit also embraced Iberia's new focus on punctuality, making it the top priority after safety, and it has made key contributions to the airline's rapid rise to the top in world airline punctuality ratings.

Engines and More

Iberia Maintenance conducts most of its major and minor MRO operations in five hangars located at the Madrid and Barcelona airports as well as a parts workshop and an engine workshop with a test house facility in Madrid. It also performs line maintenance at airports in Spain and abroad.

Iberia Maintenance is specialized in the inspection, maintenance, and repair of aircraft in the Airbus A320, A330, and A340 families, among with CFM56-5A/1-5B, CFM56-7B, V2500 and RB211-535E4 engines. As of the second half of 2018, when Iberia is to take delivery of its first Airbus A350-900 and A320 NEO, the maintenance unit will be ready to add those aircraft to its portfolio. Meanwhile, its engine specialists are preparing to work on the turbines of the future –the LEAP and PurePower PW1000G aircraft engines.

In recent years Iberia Maintenance has also taken on such tasks as the installation of new passenger cabins, entertainment and connectivity systems in 17 of Iberia's A340-600s, and the unit is now engaged in the installation of the new Premium Economy seating section in 21 of Iberia's long-haul aircraft. The conversion of Airbus A330 airliners into tankers for military in-flight refueling duties is another of the projects undertaken by Iberia Maintenance engineers.

In addition to the inspection, maintenance, and repair

H6img013: In the Hangar 6, Iberia carries out heavy maintenance tasks

of the aircraft flown by Iberia and Iberia Express, its low-cost carrier, the Spanish airline's maintenance arm serves the maintenance needs of some 100 external customers, including other airlines in the IAG group such as Vueling, and manufacturers such as Airbus, Rolls-Royce, CFM, and International Aero Engines. Work for external clients is now growing steadily as a proportion of total activity.

"The fact is that we are transforming our business to be more efficient and competitive on behalf or all the customers we serve, regardless of whether or not they belong to the IAG group," explains André Wall.

The transformation is already changing the significant business results. IAG figures show that Iberia Maintenance revenue contribution grew significantly in 2016 alone.

Training Aircraft Maintenance Technicians for the Future

In another far-sighted initiative, Iberia has joined forces with the Madrid Regional Government to establish a new training scheme under which up to 50 students per year can earn qualifications as entry-level aircraft maintenance technicians. Some 40% of the initial two-year training will take place in classrooms, while the remaining 60% will be imparted in Iberia Maintenance hangars and workshops near the Madrid airport

Successful students will be invited to complete their training during a third year at Iberia's Madrid maintenance installations, after which they will sit for examinations. Those who pass will be qualified as category B Aircraft Maintenance Technicians, meeting EASA requisites for seeking employment anywhere in the European Union and the European Economic Space.

"A number of reasons are behind our decision to launch this program," says André Wall. "Among them is that Iberia is a socially responsible company. We are committed to serving society and, with this program, we aim to support talented youth, who will be tomorrow's technicians. This training will prepare them to meet the technological and organizational challenges of the future".

The commercial aviation industry is growing, and this growth is bringing new opportunities and new challenges to the MRO industry, as it faces a workloads of more and more modern aircraft, more efficient engines, and the need to provide customized services to each customer airline. Competition will be fierce, though it seems that Iberia Maintenance is getting ready to meet it successfully.

Iberia Maintenance in brief

- In the last years, Iberia Maintenance has transformed its processes to simplify them, make them easier and more efficient, which has led to an increase in its productivity
- Fly safe, Fly on time, Fly@LowCost and Feel the innovation and continuous improvement are the new mottos of main MRO provider in Spain
- Iberia Maintenance carries out the maintenance of Iberia and Iberia Express aircraft, and it serves other customer airlines
- A Vocational Training degree on Aircraft Maintenance to train the maintenance technicians of the future is among their newest projects.

P1030799: Iberia Maintenance has retrofitted Iberia's long-haul aircraft cabins in its facilities in Madrid.

AFIC – aircraft non-payment insurance

By Duncan Batchelor and Bob Haken, Norton Rose Fulbright LLP.

Market context

The past couple of years in the global aircraft finance market have been notable for the absence of financings of Airbus and Boeing aircraft supported by the European export credit agencies (ECA) and US Ex-Im Bank. There have been different reasons for the drop off in ECA financing activity on both sides of the Atlantic, but the result is that – whereas for many years the ECAs would support the deliveries of 15% or 20% of new Airbus and Boeing aircraft (and sometimes larger numbers when financing liquidity was scarce) – airlines have had to look to other sources of finance for new aircraft in recent years, and the large manufacturers have had to monitor carefully the expected funding sources for some of their pipeline of deliveries.

Even though ECA financing has sometimes constituted a very important share of the overall aircraft finance market in the past, the overall market is of course much broader. At the same time, as part of a longer development which had its beginnings in the global financial crisis of 2008 and has continued since then, there has been a continuing increase in the diversification of funding sources for the industry.

Since the initial (and temporary) scaling back of aircraft finance lending by some banks nine or 10 years ago, many institutions and sources of capital have been drawn to financing aircraft for the first time, all with different risk appetites and return expectations, finding opportunities at many different levels of the investment spectrum – senior debt, junior debt, equity and other shades between. In addition, the use of enhanced equipment trust certificates or ECA structures allows there to be a split in roles, between the provision of capital and the assumption of risk.

This migration of investors and market participants has sometimes occurred as a result of a squeeze on available returns in other industry sectors, and it has also been encouraged by a growing familiarity with the aviation market and an understanding that aircraft assets can be more liquid than ships, power stations or real estate, and can be re-employed with other airlines in other countries to generate income.

With an industry which can appear "niche" to outsiders, this process of research, or education, about an industry can be a barrier to entry, but – once completed by institutions – it can also be a key that has the potential to unlock billions of dollars of capital.

The commercial insurance market is a huge market, where fierce competition in traditional lines sparks a continuing interest in innovation and new products. To a certain extent, some insurers (as financial institutions with assets to invest) have already participated in aircraft finance structures as capital providers. Nevertheless, the insurance of risk remains their core business, and this is the role played by insurers in the AFIC structure.

AFIC product

The AFIC aircraft non-payment insurance product has been developed by Marsh in cooperation with Boeing and seeks to make use of billions of dollars of risk capital in the insurance market, to support financiers' exposures to airline and lessor borrowers in the aircraft finance market. The insurers do not provide funding, but they assume the risk of default by providing coverage to lenders such as banks, which are expected to rely primarily on the credit of the insurers. Marsh is the exclusive broker for the AFIC product. The current consortium of insurers has an external credit rating of A (Standard & Poor's).

The basic concept and structure of AFIC is similar in many ways to an ECA financing, with an insurance policy being provided rather than a guarantee. Lenders enter into a loan agreement and advance funds to finance an aircraft, in reliance on an insurance policy which covers the risk of non-payment by the borrower. The insurance policy is issued by a consortium of insurers.

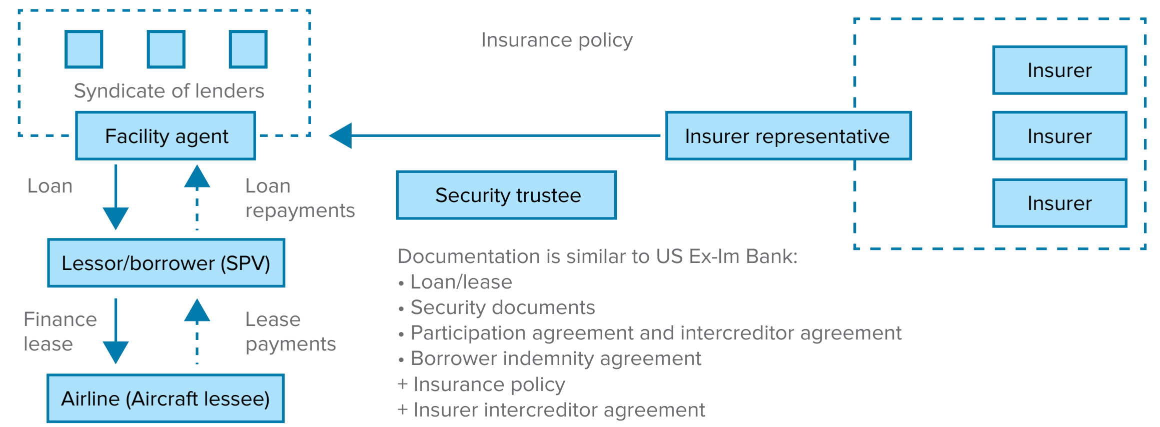
The premium for the insurance is paid in full on the drawdown date, so there is no reliance on the borrower to continue making on-going payments of premium. The premium amount can be financed as part of the loan amount, which is covered by the policy, in a similar way to ECA guarantee premium.

Insurance policy

Under the insurance policy, the insurers agree to cover the risk of a default in respect of scheduled payments of principal and interest. After a missed payment, the insurers agree to pay the missed payment (with accrued interest) within a specified number of business days.

Thereafter, unless all defaults have been cured and the deal is clearly back on track, there is an assumption that payment defaults will continue, so the insurers agree to advance scheduled payments of principal and interest on the correct payment dates in order to avoid any ongoing mismatch of funding arrangements or broken interest periods.

These payments of scheduled principal and interest continue until the earlier to occur of (i) a set period (eg, 18 months) from the first missed payment, or (ii) the date of the sale of the aircraft – at which point the insurers will



Source: *Norton Rose, September 2017*

pay the balance of the outstanding principal, with accrued interest, as one final lump sum. This period is to allow time for an enforcement of security and sale of the aircraft, or (possibly) for defaults to be remedied or debt refinanced as part of some other arrangement.

Transaction documentation and structure

Broadly speaking, the form of transaction documentation for an AFIC insured aircraft financing is similar to the documentation used for a US Ex-Im Bank-guaranteed financing. A typical structure would involve a loan made by the lenders to a bankruptcy-remote special purpose vehicle (SPV), with a finance lease from the SPV (as lessor) to the airline or leasing company. Other multiparty agreements contain the terms relating to the financing.

A customary security package is used, including an aircraft mortgage and security assignments, security over the SPV, and warranty and insurance documents. The security is granted to the security trustee, which holds the security for the insurers and for the lenders. The insurers are represented by an insurer representative (one of the insurance companies), which is a party to the transaction documentation, and is entitled to give or withhold consents or waivers much like the role of Ex-Im Bank in a US Ex-Im Bank transaction. Until there is no exposure under the insurance policy, or amount owing to the insurers, the insurer representative therefore has the role of an "instructing group" entitled to make decisions and to give directions to the security trustee, such as in relation to any event of default.

In addition, there is the insurance policy, which is a key document between the insurers and the lenders; the insurance policy takes the place of the guarantee in an ECA financing. An insurer intercreditor agreement regulates the respective rights and obligations (and voting) between the insurers, in connection with the finance documentation.

If there is a default, the facility agent will be entitled to claim under the insurance policy. Once the insurers make the payment of principal and interest to the lenders, the insurers will be subrogated to the right of the lenders in respect of that payment, which means that the insurers become entitled to claim the overdue payment from the borrower and to recover the payment in the "waterfall" (in the place of the lenders) on the distribution of any proceeds, such as from the sale of the aircraft.

Differences between ECA financing and AFIC financing

Although there are many similarities with ECA financing, there are also some key differences which apply to the AFIC structure. These include certain commercial or intercreditor considerations resulting from the use of multiple corporate insurers, some differences between insurance law and guarantee law, the bank capital regulatory analysis, which applies to an insurance policy and the fact that the insurance market is highly regulated.

A key difference is that the insurers, although highly rated, are not sovereign entities. Therefore banks will analyse and account for a transaction not on the basis of sovereign risk, but on the basis of the corporate credit rating of the insurance companies.

In addition, the insurance is provided not by one insurer, but by four insurers on a several basis. This means that each insurer is liable only for its own share of the liabilities, and there is no joint liability. Banks may therefore need to analyse and account for each portion of the debt on a different basis, taking into account the exposure to each insurer. This is also relevant to the insurer intercreditor agreement. In the event that one insurer fails to pay, the lenders will, in turn, want to be subrogated to the rights of that insurer in the insurer intercreditor agreement, to recover the relevant share of any security proceeds and to exercise the relevant share of the voting rights within the insurance consortium.

As the insurance is provided on a commercial basis, and the insurers are not bound by OECD agreements or constitutional rules in the same way as the export credit agencies are, there are no rules about any level of national content in the aircraft, nor about the invoice price applicable to an aircraft (though insurers and lenders will form their own views about values). Similarly, there is no "home country rule," which prevents leasing to countries where large aircraft are manufactured.

Insurance law

There are aspects of insurance law which are different from the law that applies to guarantees; however, many provisions of insurance law can be varied or dealt with by contract. For example, there is the requirement that the party which is insured must have an insurable interest. In a syndicated transaction, if a facility agent is the party which initiates a claim but is not a lender, then the facility agent will not have lost money as a result of the insured event – the default by the borrower. Similarly, a lender may have granted a participation to another person as part of its risk transfer arrangements. In both these cases, policy wording can be included to ensure that the insurers will not be able deny coverage as a result of a lack of insurable interest.

Another concept under insurance law is the basic duty to disclose relevant information relating to the insured risk. Under general insurance law, if an insured party fails to disclose relevant information at the inception of the policy, this can give rise to a defence for insurers if the insured risk materialises. Again, wording can be included in the insurance policy in order to limit this duty, specifying what information has been disclosed (eg, information memoranda) and specifying which individuals are in the deal team whose knowledge is relevant, and excluding defences which might otherwise be available to insurers.

Generally, as is often the case in negotiated insurance contracts, although there are general principles of insurance law, which are protective of insurers, these provisions can be addressed by express drafting in order to end up with an insurance policy which is "as good as" a guarantee. Nevertheless, the document must be an insurance policy, in line with the requirements applicable to the insurers which issue it.

Bank regulatory analysis

Banks entering into a finance transaction in reliance on the insurance policy, and the creditworthiness of the insurers, will also want to ensure that they can receive the desired regulatory capital relief in order to benefit from the structure, or to price their transaction accordingly.

For CRD IV purposes, applicable to European banks, financiers will therefore want to check or receive a legal opinion that the insurance policy is akin to a guarantee, in the context of the overall structure of the transaction. Of course, it is the lending banks (rather than the facility agent) which need to receive the capital relief. Among other things, the protection needs to be direct, which means that mechanisms need to be included to enable individual lenders to initiate a claim process in the event that the facility agent omits to do so, and the structure needs to provide for the lenders to have the right to receive the proceeds. It is also necessary to check that no circumstances outside the control of the lenders can invalidate the protection. Again, this is dealt with by contractual provisions in the policy, as well as by structural protections in the finance documentation.

Part of our role as advisers to the lending banks is to advise on the structure and the policy, and we have been able to provide opinions on these matters for CRD IV purposes.

US capital rules for banks are slightly different to the European rules. Helpfully, the US rules make express reference to insurance as being an eligible instrument. There are different rules about what type of institution is an eligible guarantor for the purposes of capital relief, and it is necessary to check how direct the protection is.

Insurance regulation

Finally, it is important to understand that the insurance market is highly regulated. There are many different regulations relating to the selling or provision of insurance, and the regulations usually depend on the identity and jurisdiction of the insured. This means that an insurer may have to hold certain licences, and comply with certain regulatory requirements, to provide insurance to a customer in one country, yet may need to hold different licences and comply with different requirements to write insurance for a customer in another country. Insurers, much like banks, may act through many different group companies depending on the applicable regulatory regime.

If the lenders are the insured, then the insurers will need to carry out their own regulatory analysis on each lender. This may affect the process of syndication by lenders, if lenders seek to transfer a loan interest to a new party. Details such as these need to be considered at the documentation stage of a transaction, and participations or other arrangements may need to be used by lenders in order to give them maximum flexibility. Other variations on the basic AFIC transaction structure may be able to be used in order to allow greater flexibility, or to avoid the lenders being treated as the insured in the regulatory analysis by the insurers. These structures need to balance both the insurers' regulatory needs with the banks' own regulatory capital requirements.

The future

The development of the AFIC product marks a positive step in broadening the availability of financing and credit support for aircraft deliveries, and Marsh and Boeing should be congratulated for their work. By all accounts, the AFIC insurers intend to continue to grow their portfolio of aircraft and airline customers and do not see the role of commercial insurance as being merely temporary. Even if ECA finance returns to previous levels, there is clearly a logic in developing a diversified pool of assets and risks.

More generally, the interest of the insurance market in the world of aircraft finance, and the process of education and research which has been undertaken in respect of the aviation industry, show that aircraft investors and manufacturers may have a yet broader range of funding sources to call on in the years ahead.

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The impact of the multilateral instrument within the world of aviation finance

On 7 June 2017 at the OECD in Paris, 68 countries signed the Multilateral Instrument (MLI), which provides a mechanism for countries to transpose Base Erosion and Profit Shifting (BEPS) recommendations into their existing bilateral tax treaties.

The MLI was designed to modify tax treaties between two or more parties to the MLI in line with measures arising from the G20/OECD BEPS Project. The MLI does not operate in the same manner as an existing treaty protocol amendment; rather, it will sit alongside the existing treaties to be interpreted in conjunction with those treaties.

At the outset of this article, it makes sense to provide a brief overview of the MLI.

It is expected that the participation of the 68 jurisdictions will result in the amendment of more than 1,100 treaties – this represents about one-third of the global total tax treaties. As noted, the MLI provides a mechanism to transpose BEPS recommendations into existing tax treaties. While there are a number of provisions contained within the MLI, and the BEPS Project identified 15 actions to address, there are only a small number of minimum standards within the MLI. The countries which have signed up to the MLI have committed to adopt such minimum standard recommendations. The minimum standard changes are in the areas of treaty abuse (Article 7), mutual agreement procedures (Article 16-17) and treaty preambles.

The purpose of this article is to discuss the impact the MLI will have on the aviation finance industry now that we are further down the path of understanding how different jurisdictions have elected to apply its provisions. In particular, we will focus on the impact of the treaty abuse provisions on the aviation finance industry.

Article 7 addresses concerns that double-tax treaties could be used to make available treaty benefits in unintended circumstances. Optionality is given to support the different approaches permitted under the minimum standard – namely, the adoption of a principal purpose test (PPT) or a PPT supplemented with a simplified limitation on benefits rules (LOB).

All 68 jurisdictions (including Ireland) have opted to include the PPT within their double-tax agreements. This was the minimum standard required on becoming a party to the MLI. Twelve jurisdictions, however, have also chosen to apply the simplified LOB rules – these are Argentina,

Armenia, Bulgaria, Chile, Colombia, India, Indonesia, Mexico, Russia, Senegal, Slovak Republic and Uruguay.

So what does the PPT look like? The text has broadly been agreed for some time and is included in the MLI as follows:

"Notwithstanding any provisions of a Covered Tax Agreement, a benefit under the Covered Tax Agreement shall not be granted in respect of an item of income or capital if it is reasonable to conclude, having regard to all relevant facts and circumstances, that obtaining that benefit was one of the principal purposes of any arrangement or transaction that resulted directly or indirectly in that benefit, unless it is established that granting that benefit in these circumstances would be in accordance with the object and purpose of the relevant provisions of the Covered Tax Agreement."

The PPT is in essence an anti-treaty abuse provision within the treaty itself. It seeks to disallow the benefits of a particular treaty where, broadly, the principal purpose of establishing a particular transaction was to obtain the benefits of a tax treaty. For example, a pure conduit company with no commercial substance which has been interposed into a transaction to benefit purely from the favourable terms of a double-tax treaty between two jurisdictions would likely not qualify for tax treaty benefits once the MLI is ratified into treaties.

As noted above, there are a number of jurisdictions which have, in addition to the PPT, included a simplified LOB provision. A natural question arises as to what happens when one party has signed up to the PPT and the counterparty to the double-tax treaty has included a simplified LOB clause?

There are a multitude of outcomes that are relevant depending on the reservations and options chosen by each party; however, broadly, and in most scenarios, where one party has included the PPT and the counterparty jurisdiction has included the PPT and simplified LOB, only the PPT will apply.

For example, Ireland has chosen to apply the PPT only. It has not made additional optional choices – for example, to allow a simplified LOB to apply symmetrically or indeed asymmetrically for the purposes of granting treaty benefits in a case where a counterparty to an Irish tax treaty has chosen to include a simplified LOB. As a result, the PPT should be the only test for Ireland's network of double-tax treaties going forward, unless Ireland in future agrees to the application of the simplified LOB to apply to treaties that it has concluded with those 12 countries that have opted for the simplified LOB.

The specific BEPS report (Article 6: Preventing the Granting of Treaty Benefits in Inappropriate Circumstances) no doubt in the future be relevant to interpret how the PPT applies. The BEPS report states that it must be reasonable to conclude that one of the principal purposes of an arrangement or transaction was to obtain the benefits of the tax treaty. As can be seen, the treaty benefit does not have to be the sole or dominant purpose to fall foul of the PPT; if one of the principal purposes is obtaining the treaty tax benefit it would be sufficient for the benefit to be disallowed. Furthermore, it states that a purpose will not be a principal purpose when it is reasonable to conclude that obtaining the tax treaty benefit was not a principal consideration and would not have justified entering into any transaction or arrangement that has resulted in that benefit.

The BEPS report notes that it is important to undertake an objective analysis of the aims and objects of all persons involved in putting the arrangement or transaction in place when considering whether or not one of the principal purposes is to obtain tax treaty benefits.

The commentary goes on, however, to note that, where the only reasonable explanation for a particular transaction or arrangement being established in a certain way is for obtaining tax treaty benefits, then it will be concluded that one of the principal purposes of that arrangement was to obtain the benefits. This clearly points to the fact that, when undertaking an objective analysis of an arrangement or transaction, other reasonable explanations require consideration before making a determination.

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The OECD guidance highlights, however, that where an arrangement is inextricably linked to a core commercial activity, and its form has not been driven by considerations of obtaining a tax treaty benefit, it is unlikely that its principal purpose will be considered to be to obtain that tax treaty benefit.

The PPT is aimed at tackling artificial arrangements and so the OECD are, through the guidance, making it clear that where there is a core business activity and other reasonable explanations for setting up a transaction in a certain way (or in a certain jurisdiction) then the mere existence of a tax treaty benefit should not be sufficient to consider that such a benefit was one of the principal purposes.

Rather unhelpfully, though, the examples within the BEPS Action 6 Report of acceptable and unacceptable arrangements do not contain an example specific to the leasing of assets of any kind. However, there are a number of examples that outline the direction of thinking that one could reasonably expect would be followed by tax authorities in the future when determining whether obtaining treaty benefits was one of the principal purposes of a chosen arrangement (but, of course, only time will tell how different jurisdictions will interpret the guidance).

One example postulates the scenario where a group is considering establishing a regional company to provide group services to other subsidiaries. After reviewing a number of possible locations, it decides to establish this regional company in State "R". The example further states that the decision is mainly driven by the skilled labour force, reliable legal system, business-friendly environment, political stability, membership of a regional grouping, sophisticated banking industry and the comprehensive double-taxation treaty network of "R", including its tax treaties with certain jurisdictions where related parties of the company are based.

In this example, the BEPS report suggests that merely reviewing the effects of the double-tax treaties of a country on future payments would not enable a conclusion to be drawn about the purposes for the establishment of this company in a particular state.

The example states that, assuming the functions to be provided, including the making of decisions necessary for the conduct of its business, constitute a real business through, which it exercises substantive economic functions, using real assets and assuming real risks, and provided that business is carried on in that particular state through its own personnel located there, it would not be reasonable to deny the benefits of the treaties concluded between the two states. This should be the case unless there are other facts that would indicate the company has been established for other tax purposes or unless the company enters into specific transactions to which the PPT would otherwise apply.

Other examples cite other useful non-tax considerations, which could reasonably be applied to a situation where a favourable location is chosen as an aircraft-leasing platform. They include transportation issues and time differences and developed international trade and financial markets.

The BEPS Action 6 Report also provides examples of transactions that may be considered conduit arrangements (again, unhelpfully not specific to leasing transactions although other types of financing transactions are mentioned).

TCO, a company resident of State T, which does not have a tax treaty with State S, loans 1,000,000 to SCO, a company resident of State S that is a wholly owned subsidiary of TCO, in exchange for a note issued by SCO. TCO later realises that it can avoid the WHT on interest levied by State S by assigning the note to its wholly owned subsidiary RCO, a resident of State R (the treaty between States R and S does not allow source taxation of interest in certain circumstances). TCO, therefore, assigns the note to RCO in exchange for a note issued by RCO to TCO. The note issued by SCO pays interest at 7% and the note issued by RCO pays interest at 6%.

In this example, the BEPS report notes that the transaction through which RCO acquired the note issued by SCO constitutes a conduit arrangement because it was structured to eliminate the WHT that TCO would otherwise have paid to State S.

Given the examples above, how is the impact on aviation finance determined and, in particular, the cross-border operating leasing of aircraft?

In a survey Deloitte conducted in conjunction with *Euromoney* in late 2016 (report published as Aviation Finance and International Tax Reform, January 2017), of more than 400 senior executives in the aviation finance industry, some 50% of respondents agreed that proposed double-tax treaty changes will have an impact on the

Matthew Dolan, Director, aircraft leasing and finance advisory, Deloitte

negotiation of aircraft lease agreements – in particular, the provisions of tax gross-up clauses.

Among the top 50 airlines, the average proportion of aircraft leased (as a percentage of total fleet) is just below 40% and of the top 50 airlines globally, the value of their leased fleet is more than $140 billion (representing more than 4,200 aircraft). Clearly, access to double-tax treaties is of paramount importance to lessors and airlines alike. The mitigation or elimination of withholding taxes on lease payments can be a key determinant in whether a lease transaction is economically mutually beneficial.

Generally, in most standard lease agreements, the risk of WHT lies with the lessee as a result of the operation of WHT gross-up clauses. The gross-up clause broadly provides that in most instances, if WHT is required to be applied to a lease rental payment, the lessee is required to make an additional payment to place the lessor in the position it would have been had no WHT applied. In the Deloitte and Euromoney report, however, survey respondents were split when considering who ultimately would end up bearing additional tax costs arising from BEPS.

The first important point to note in evaluating the impact of the MLI is that the rules are new, untested and not yet in effect. The guidance issued by the OECD thus far is useful but ultimately the impact will depend on how different jurisdictions around the world apply the new provisions, and also how different jurisdictions react. For example, once the full impact of the MLI is understood, some jurisdictions may exempt lease payments for the use of commercial aircraft from local withholding taxes entirely (but perhaps that is wishful thinking).

However, despite this uncertainty there are a number of common themes emerging from the OECD guidance. Broadly, they come down to the use of real assets, exposure to real risks, and the location of the substantive economic functions relative to that particular business.

The three factors above can appear in different permutations and combinations in the context of different leasing structures and as such a range of substance types and possible outcomes can be identified.

In its simplest form, for example, at one end of the range is the situation where a leasing entity engages in substantive economic aircraft-leasing functions in its tax jurisdiction through a number of senior key decision-making executives and employees permanently based there. The leasing entity also owns the aircraft on its balance sheet and has raised the finance. The MLI is highly unlikely to have any impact on leases concluded by such a leasing entity, no matter how tax efficient the jurisdiction is where it is based.

At the other end of the range is the situation where the leasing entity does not own the aircraft (either legally or on its balance sheet), is not exposed to any risk relative to the aircraft or the financing raised, and also carries on no real functions in its jurisdiction of tax residence with no employees. Based on current OECD guidance, there is a clear risk such an entity would be denied the benefits of a tax treaty concluded by the jurisdiction in which it is tax resident under the PPT of the MLI.

The more uncertain or grey area lies between these two opposite ends of the range where different jurisdictions may have different interpretations of the PPT. Within this range, for example, could be leasing entities which own the aircraft, but lack substantive economic functions. Or an entity that carries on substantive functions through employees, but with the entity itself not owning the asset and with no real exposure to asset risk. It is within this uncertain area where further consideration and analysis is required and an action plan is required to move closer to the right side of the range to mitigate uncertainty.

Other considerations

Permanent establishments

While not a minimum standard, there were a number of proposed amendments to the threshold at which a permanent establishment (taxable presence) arose.

Article 12 of the MLI broadly sought to introduce a new test for when an agent could trigger a permanent establishment in a particular jurisdiction (with a particular focus on commissionaire arrangements). Specifically, Article 12 could apply where a person is acting in another jurisdiction on behalf of an enterprise and, in so doing, habitually concludes contracts or habitually plays the principal role leading to the conclusion of contracts that are routinely concluded without material modification by the enterprise. In other words, under the new Article 12, the activities of a marketing team in the customer (eg, airline) jurisdiction will trigger an obligation to file tax returns (and pay tax) in that jurisdiction much more easily than under current law.

Many countries have, however, reserved the right not to apply this Article of the MLI. Ireland, for example, has reserved its right not to include this new test "due to continuing significant uncertainty as to how the test would be applied in practice". Consequently, this provision should not apply to any of Ireland's Covered Tax Agreements.

China has also reserved the right for the entirety of this article not to apply to its Covered Tax Agreements. Indonesia considers that it already has provisions within its Covered Tax Agreements that sufficiently capture the proposed language, as does Russia. From a European perspective, only eight countries opted for this change: Croatia, France, Lithuania, the Netherlands, Romania, Slovakia, Slovenia and Spain. Other major EU countries such as Germany and the UK did not include the provisions.

There was more uptake with respect to the other changes to permanent establishment definitions but none were as significant in terms of triggering permanent establishments as Article 12.

With respect to the effective date of the MLI, individual signatories will need to ratify the MLI in line with their domestic constitutional arrangements. The MLI must be ratified by at least five jurisdictions before it first enters into force. Following a period of three months after the date of ratification by the fifth state, the MLI will enter into force for those first five jurisdictions at the start of the subsequent calendar month. A three-month period will apply for all other jurisdictions that subsequently ratify the MLI. The MLI can enter into effect for a specific Covered Tax Agreement only after the three-month period has expired for all parties to the Covered Tax Agreement. Broadly speaking, in most instances the MLI will take effect from January 2019 onward.

Concluding remarks

Lessors and airlines should be considering the impact of the MLI on their business and the PPT, in particular. A review of the lease portfolio to determine those instances where double-tax treaty relief is being relied on to mitigate foreign withholding taxes on lease payments should be undertaken. If reliance is being placed on a double-tax treaty to reduce such withholding taxes, it should be considered whether suitable substance is present in such jurisdictions to support a position that the new PPT rule should not adversely impact the leasing entity's ability to avail of tax treaty benefits.

It is worth pointing out again that the PPT is aimed primarily at tax-driven conduit arrangements. While the PPT will give rise to a level of uncertainty and greater transactional analysis in future before lease agreements are entered into, there are often a number of strong commercial non-tax reasons to support the establishment of leasing operations in countries which could greatly mitigate the risk of denial of treaty benefits.

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Aviation Growth and Opportunity in the Land of Silk and Money

As part of its thought leadership programme, earlier this year, Avolon, China's largest aircraft lessor published a two-part White Paper, 'The Land of Silk and Money'.

The series firstly examines the development, growth and evolution of China's domestic airline industry and secondly, analyses China's international inbound and outbound travel markets with a focus on future fleet requirements of China's domestic and international airline industry. Dick Forsberg, Avolon's head of strategy and author of the series, details the key findings and outlines the potential for future growth of the Chinese aviation market.

With over 1.3 billion people, China is the most populous country on earth and is five times larger than the USA. Gross Domestic Product (GDP), growing at an average of 13% per annum over the past 20 years, ranks second globally, trailing the USA by 40%. With forecasted economic growth, the gap in GDP is expected to narrow by 20% within the next five years. Strong momentum has propelled China's economic development into its third phase. Central planning themes for the Chinese economy for the next five to 10 years will focus on the realignment and positioning of the economy, emphasising the upscaling of industry and manufacturing to deliver greater efficiency, innovation and value-add for the economy.

In the first part of the White Paper we examined the development of the country's domestic passenger airline system and aviation infrastructure, the evolution of the regulatory framework governing safety, operations and capacity and the growth and gradual maturing of domestic air travel.

We found that domestic air passenger numbers are forecast to double over the next decade, reaching 840 million by 2026, with domestic passenger growth averaging 6.8% per annum. During this time, low-cost carriers (LCC) will continue to achieve the highest growth rates, while the "Big 3" incumbent airlines will add the largest number of passengers to their established networks. In 2015 alone, Chinese airlines operated over three million flights with 500 million seats on domestic routes. Over 380 million sector passengers were carried, producing a system load factor of 77%. Further analysis of these statistics highlights the key influencers for the rapid increase in China's domestic airline industry as a combination of economic growth, urbanisation, the rise of consumerism, increasing disposable income and the availability of increasingly affordable, LCC capacity.

Dick Forsberg, Avolon's head of strategy

Moreover, new LCC entrants to the market have offered passengers greater choice further stimulating domestic demand. Chinese LCCs are currently achieving the highest growth rates of any airline group in the market, increasing traffic volume by 38% *per annum* in the five years to 2015. The gradual relaxation in the aviation regulatory environment in China has augmented strong consumer demand and helped stimulate the development of a broad-based airline community.

While current and forecasted domestic air passenger numbers are encouraging, there are still significant obstacles that will have to be addressed. Structural problems, including inefficient and limited airspace capacity, congested airports, a shortage of pilots and bureaucratic approval procedures will all continue to challenge current operations and potentially stifle future growth. The Chinese Government has sought to address its infrastructure deficiencies by allocating $11.7 billion from

its 2016 budget for investment and upgrades of current airports and construction of new ones. Eleven major infrastructure projects and over 50 upgrades to existing facilities are underway, including new airports in Beijing, Chengdu, Qingdao, Xiamen and Dalian. This budget also includes improvements to air traffic control facilities and airline fleet growth. Construction of a further 60 new airports by 2020 is also well advanced.

In a global context, the Chinese aviation market has become very attractive and lucrative for both domestic and international airlines. In 2012, China overtook Germany and the USA to become the world's largest generator of outbound travel. In 2016 over 120 million Chinese travelled to international destinations. This number represents less than 9% of the total population and only 15% of urban residents, suggesting that there significant more growth to come on top of the average 17% annual increases achieved over the past five years. These international travellers spent $110 billion, underlining China's attractiveness as a market and its growth potential as an international destination.

China is the world's largest generator of outbound travel, with more than 120 million Chinese visiting international destinations in 2016. This still represents less than 10% of the population. The majority of inbound and outbound travel is undertaken by air, with 150 airlines providing international services from 82 Chinese airports, operating 800,000 flights annually, with China's international air traffic growing at an annual rate of 14% since 2010 to reach 126 million one-way passengers in 2016.

For the majority of outbound Chinese tourists (a metric that includes all journeys undertaken for business or leisure purposes), international travel experiences often begin with trips to destinations in Greater China (Hong Kong, Macau and Taiwan). As confidence and spending power increases, travellers venture further afield, first to destinations in North and Southeast Asia, then to Australasia, Europe and the USA.

Of the Chinese outbound air traffic, domestic airlines have a 49% market share. In addition to the 'Big 3', 18 Chinese airlines now operate international routes, accounting for 30% of the overall Chinese share. However, the recent surge in new Chinese airlines entering international markets, particularly long-haul, may be unsustainable, especially as local government launch subsidies (which can cover up to 50% of the operating costs) run out.

China's international passenger growth has no signs of slowing down either, with numbers forecasted to increase by 8.9% per annum over the next 10 years to reach 300 million by 2026. For Chinese airlines, the forecast growth rate is higher, averaging 11.7% per annum. This represents an appealing opportunity for Chinese airlines to further increase their market share in China and global capacity.

With strong domestic demand for travel and continually increasing outbound passengers, it's imperative China has enough aircraft to meet the travel demand of its population, both domestic and international.

By the end of 2016, China had an in-service passenger fleet of 2,800 aircraft, representing 13% of the world fleet. This has grown annually by 11% since 2010. The fleet has a high narrowbody mix compared to the average for the rest of the world (80% vs 58%). Chinese airlines are consequently under-resourced in widebody aircraft. Chinese domestic and international carriers have a further 1,600 aircraft, on firm order or under Letter Of Intent, taking the total committed fleet to more than 4,400 aircraft.

While Chinese airline fleets, in all size categories, have grown substantially faster than those of other global airlines since 2010, we believe that, in order to meet the expected increase in passenger numbers, significant fleet additions will have to be made. We estimate that 3,200 additional aircraft will be required by Chinese airlines over the next 10 years. Over 50% of these have to be ordered, including 1,150 narrowbody aircraft, 400 widebody aircraft and 150 regional jets.

To address its aircraft requirements China has two clear options; manufacture its own aircraft, or place orders with lessors and OEMs to make up the shortfall in supply.

The Chinese Government has made China's capacity to manufacture its own aircraft as one of 10 priority sectors for the "*Made in China 2025*" industrial policy programme. Results so far have been positive, with the state-owned Commercial Aircraft Corp. of China (COMAC) recently launching its first aircraft, a single aisle airliner that will compete directly with the Boeing 737 and Airbus A320. While initial tests are encouraging, it will take considerable time before China becomes a global and domestic aircraft supplier.

Increasing demand, aircraft supply shortages and a lack of domestic aircraft manufacturer, provides an excellent opportunity for global lessors and OEMs to capitalise on the under-ordered position of the Chinese aviation industry, particularly in the widebody segment of the market. I expect to see more orders similar to the 140 Airbus order (comprising of 100 A320 and 40 A350 aircraft) recently made by the Chinese Government, as well as large Boeing 737 Max orders that were made at the 2017 Paris Air show by a range of Chinese lessors and airlines, including Avolon.

With China just beginning to enter its next economic phase, its potential for growth is significant. This next period also offers the Chinese aviation sector an exciting window to continue on its strong growth trajectory, especially if the economy continues to grow at the same pace. Based off our analysis in '*The Land of Silk and Money*', we would expect both, China's domestic aviation market and their exposure to the international aviation market, to continue to experience strong and consistent growth over that period. However, to fully maximize this opportunity, it is extremely important that China addresses the current aircraft shortfall and improves their aviation infrastructure.

Aviation Finance Comparative Jurisdiction Report

Executive summary

This report was commissioned by Abu Dhabi Global Market (ADGM) and prepared by PwC to analyse the suitability of ADGM as a regional aircraft financing and leasing hub from a tax perspective, with a particular focus on the UAE's extensive double taxation treaty (DTT) network.

The report considers both operating and finance leases and compares the UAE to the traditional global hubs for aviation finance and leasing activities: Ireland, Singapore, Hong Kong and Cayman Islands ("comparison jurisdictions").

The commercial case for aircraft financing and leasing businesses to be based in Abu Dhabi is strong. The UAE is home to two of the world's top airlines and a further two ambitious low-cost carriers. It already has one of the world's busiest airports and both Abu Dhabi and Dubai are currently working on new huge airports to cement their positions as global aviation hubs.

The UAE has impressive aviation credentials, and the wider Middle East region is forecast to be the highest growth aviation market over the next 20 years. With Asia, followed by Africa, making up the top three fastest growth aviation regions, Abu Dhabi is ideally geographically positioned to serve these high-growth markets. Further, with aircraft debt and leasing funds emerging as an attractive and better-understood asset class, Abu Dhabi, with its abundance of wealth, presents an attractive market to raise capital.

ADGM companies benefit from a full English common law environment, 0% corporate tax exemption until 2063, no foreign ownership restrictions, no limits on repatriation of profits and no withholding taxes, as well as independent courts and financial services regulator.

We believe there is a strong case for the incorporation of a regional presence in ADGM, whether lessors, banks, advisory firms or other businesses across the sector ecosystem, to be closer to regional clients and business. With a highly competitive special purpose vehicle (SPV) regime, benchmarked against the world's leading jurisdictions, ADGM also serves as an attractive domicile of SPVs for the structuring of aircraft transactions (with the first transactions successfully concluded). ADGM is aiming to build an active community of businesses to serve the local and regional markets in the aviation finance and leasing sector.

We hope that you find this report useful, and it enables you to identify clear opportunities to enhance operational and tax efficiency for your business. We welcome all discussions of ADGM's offerings and how the ADGM platform can serve your business needs. Please do not hesitate to contact us.

Tax analysis

PwC's analysis presents some clear strengths and opportunities from a tax perspective over the comparison jurisdictions.

The UAE has an extensive network of DTTs, with 81 in force and a further 32 in various stages of negotiation, signature or ratification (as of 28 February 2017). The UAE also has 15 DTTs that none of the comparison jurisdictions have, including 13 DTTs with countries in Africa (five), Central Asia (four) and the Middle East (four).

In addition to a wide and favourable DTT network, ADGM offers a 0% CIT rate to ADGM companies and the UAE does not levy withholding taxes on outbound interest, dividend and other payments.

The UAE Ministry of Finance has set certain minimum substance and procedural requirements that, while not overly onerous, must be met by ADGM companies in order to receive a tax residency certificate. A UAE tax residency certificate is typically required for access to the UAE treaty network, subject to meeting any additional treaty application requirements in the source countries. With the ongoing implementation of new anti-treaty shopping measures as a result of the G20/OECD Base Erosion and Profit Shifting initiative, ADGM's SPV product for aircraft financing and leasing is most appropriately utilised by businesses with active operations in the UAE if treaty benefits are commercially important.

The tax treatment of leases generally depends on whether the lease is treated as an operating lease or as a finance/capital lease. Under an operating lease, the lessee would typically recognise tax-deductible lease payments as and when they arise. Under a finance lease, payments made by the lessee would generally represent a finance charge on the lease obligation and principal repayments.

Operating lease

Aircraft operating lease payments either fall within the "shipping and air transport", "business profits" or "royalties" articles under a DTT. Generally, if the wording "for the use of, or right to use industrial, commercial, or scientific equipment" is not included in the royalties article, then the income should fall under the more favourable "shipping and air transport" or "business profits" articles where there is typically an exemption from any WHT in the jurisdiction of the lessee.

Finance lease

If a lease is treated as a finance lease then the finance charge may be subject to interest WHT in the jurisdiction of the lessee. This WHT on interest may be reduced under the interest article of a DTT.

Countries with which 0% tax is applied on lease payments under the terms of the UAE DTT

		Operating Lease 0%	Finance Lease 0%
1	Albania	✔	✔
2	Algeria	✔	✔
3	Armenia	✔	✔
4	Austria	✔	✔*
5	Barbados	✔	✔
6	Belgium	✔	✔
7	Bosnia and Herzegovina	✔	✔
8	Brunei		✔
9	Bulgaria	✔	
10	Chile	✔**	
11	Cyprus	✔	✔*
12	Czech Republic		✔
13	Estonia	✔	✔*
14	Fiji	✔	✔
15	Finland	✔	✔*
16	France	✔	✔
17	Georgia	✔	✔
18	Germany		✔
19	Guinea	✔	✔
20	Hong Kong		✔[1]
21	Hungary	✔*	✔*
22	Indonesia		✔
23	Ireland	✔*	✔
24	Italy	✔	✔
25	Japan	✔	
26	Jordan	✔	
27	Korea (Rep.)	✔	
28	Kyrgyzstan	✔	✔
29	Latvia	✔	✔
30	Lebanon	✔	✔
31	Liechtenstein	✔	✔*
32	Lithuania	✔	✔
33	Luxembourg	✔	✔*
34	Macedonia	✔	
35	Malta	✔*	✔*
36	Mauritius	✔	✔
37	Mexico	✔	
38	Montenegro	✔	
39	Morocco	✔	
40	Mozambique	✔	✔
41	Netherlands	✔*	✔*
42	Panama	✔	
43	Poland	✔	
44	Portugal	✔*	
45	Romania	✔	
46	Seychelles		✔
47	Singapore	✔	✔
48	Slovenia	✔	
49	South Africa	✔*	
50	Spain	✔*	✔
51	Sudan	✔	✔
52	Switzerland	✔*	✔
53	Syria	✔	
54	Tajikistan	✔	✔
55	Thailand		✔
56	Tunisia	✔	
57	Turkmenistan		✔
58	Ukraine	✔	
59	United Kingdom	✔*	✔
60	United States	✔**	
61	Uzbekistan	✔	
62	Venezuela	✔	
63	Yemen	✔	✔

* Exemption also available at domestic level
** Exemption available under the UAE transport tax treaty (applies only to aircraft operated in international traffic)
1. Exemption available at domestic level, treaty rate is higher than domestic rate

Geographic highlights

Africa: on the whole, the countries of Africa have relatively underdeveloped treaty networks. However, the UAE has the most active treaties in Africa compared with the comparison jurisdictions, with 10 in force treaties and 12 treaties awaiting ratification or entry into force, including DTTs with key markets such as South Africa, Ethiopia, Kenya and Nigeria. That is, on average, four times more DTTs than the comparison jurisdictions. The remaining 25 African countries do not have DTTs in force with the UAE or any of the comparison jurisdictions, placing ADGM on an equal footing from a tax perspective but with a strong geographical advantage.

Central Asia: the UAE has DTTs with all of the central Asian countries, including three that do not have treaties with any of the comparison countries. ADGM also has a strong geographical advantage in this market.

The UAE has equally favourable or better DTTs with the following growth aviation markets compared with the comparison jurisdictions:

	Operating Lease	Finance Lease	Geographic Advantage
Algeria	Advantage (0%)	Advantage (0%)	✔
Egypt	Equal (10%)	Equal (10%)	✔
India	-	Advantage (5%)[1]	✔
Indonesia	Equal (5%)	Advantage (5%)	
Iran (no DTT)	Equal	Equal	✔
Japan	Equal (0%)	Equal (10%)	
Korea (Rep.)	Equal (0%)	-	
Lebanon	Advantage (0%)	Advantage (0%)	✔
Malaysia	-	Advantage (5%)	
Mexico	Equal (0%)	Equal	
Pakistan	-	Equal (10%)	✔
Philippines	Equal (7.5%)	Advantage (10%)	
Sri Lanka	Advantage (10%)	Equal (10%)	✔
Thailand	-	Equal	
Turkey	Equal (10%)	Equal (1%)	✔
United States	Equal (0%)[2]	Equal (0%)[3]	

1. When paid to a bank or similar financial institution
2. Exemption only available where aircraft are operated in international traffic (i.e. not U.S. domestically operated aircraft)
3. The rate is 30% for interest that does not qualify as portfolio interest

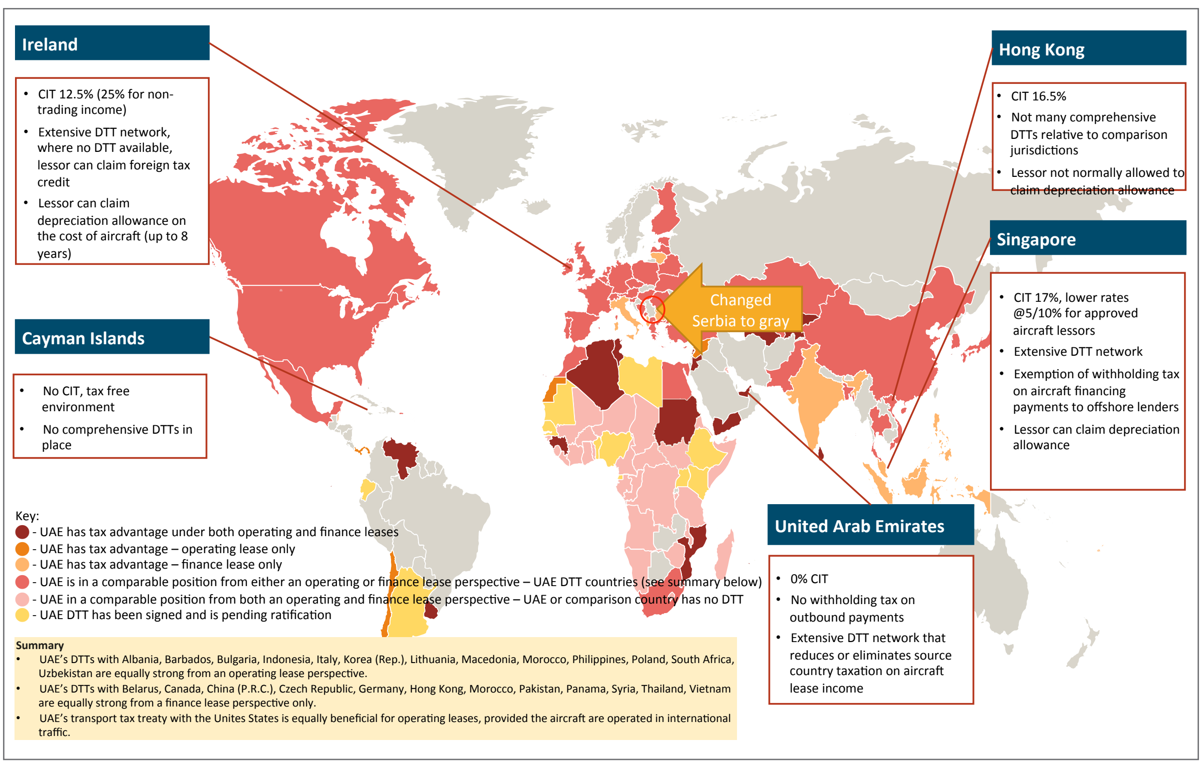
On the whole, the UAE's treaty network tends to be most favourable for finance leases with low treaty withholding tax (WHT) rates on interest (equivalent) payments. With incoming IFRS 16 changes, lessees will be required to recognise nearly all leases on the balance sheet which will reflect their right to use an asset for a period of time and the associated liability that attracts interest. While the impact of the new leasing standard on the aviation sector and the tax treatment of leases is yet to be seen, the IRFS 16 changes may result in lease payments being considered as interest payments with WHT applied accordingly, increasing the relative strength of the UAE DTT network.

Strengths and opportunities summary

Strengths

- The UAE DTT network is large, especially for a country that historically has had little taxation. With 81 DTTs in force, the UAE's network is already wider than nations such as Ireland and Hong Kong. If you include the DTTs that have been signed but are awaiting ratification or entry into force, the UAE also has a more extensive DTT network than Singapore;
- Income from operating leases is exempted from source country taxation under 63% of UAE DTTs, which is a higher proportion than the comparison jurisdictions. Out of the remaining UAE DTTs that allow operating lease income to be taxed as royalties, 45% of the DTTs offer the best royalty WHT rate available compared with all of the comparison jurisdictions;
- Interest (equivalent) income from finance leases is subject to the lowest WHT rate available under 93% of UAE DTTs compared with all of the comparison jurisdictions;
- The UAE has 10 DTTs in force with African countries (including Egypt). This number will grow to 22 once the DTTs signed with Benin, Burundi, Comoros Islands, Ethiopia, Equatorial Guinea, Gambia, Kenya, Libya, Mauritania, Nigeria, Senegal and Uganda enter into force (see below). The next best jurisdiction is Singapore, which has seven DTTs in force with African countries (Ireland has six in force DTTs and Hong Kong has one DTT);
- The UAE is better or equally beneficial from a DTT perspective as the comparison jurisdictions in Africa except for Botswana, Rwanda and Zambia;
- The UAE is geographically closer to the GCC, Levant (including Turkey) and most African countries (including Egypt) than the comparison jurisdictions (only Ireland is closer to certain African countries);
- The UAE has a DTT with all Central Asian countries;
- Favoured nation clauses in the UAE's DTTs with Indonesia, Thailand and Ukraine offer ADGM entities the best WHT rate available on interest income. If Indonesia, Thailand and Ukraine ever negotiate a more favourable WHT rate for interest with any other jurisdiction, then the more favourable WHT rate of

Comparison of ADGM with other leasing centres (1 of 2)



that treaty should automatically apply to treaty eligible ADGM entities as well. This positions the UAE as one of the most favourable jurisdictions from a tax perspective for finance leasing into Indonesia, Thailand and Ukraine;

- The UAE-India DTT offers a 5% WHT rate for interest paid by Indian borrowers to a UAE bank or a similar financial institution (WHT rate of 12.5% in all other cases), which is better than the WHT rate offered in all of India's other DTTs (with the exception of the India-Switzerland DTT). These favourable rates may make ADGM attractive for finance leasing into India; and
- The UAE has a transport tax treaty with the US, which exempts the leasing of aircraft under an operating lease from US taxation provided the aircraft are operated in international traffic. The interest component of finance leases can benefit from a domestic US WHT exemption if certain conditions are met.

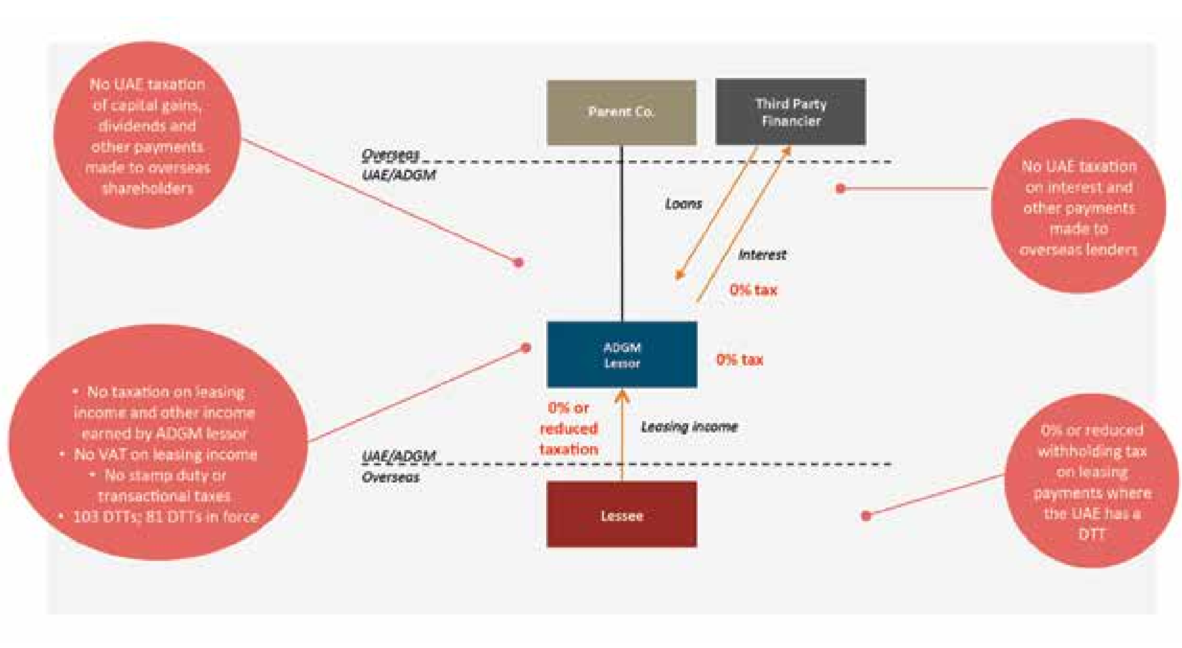
Opportunities

- The UAE has 15 DTTs with African countries, which are in various stages of negotiation, signature or ratification. Singapore has six DTTs with African countries that are in the process of negotiation, signature or ratification. Hong Kong and Ireland currently only have one DTT that is either under negotiation or has been signed with Africa countries.

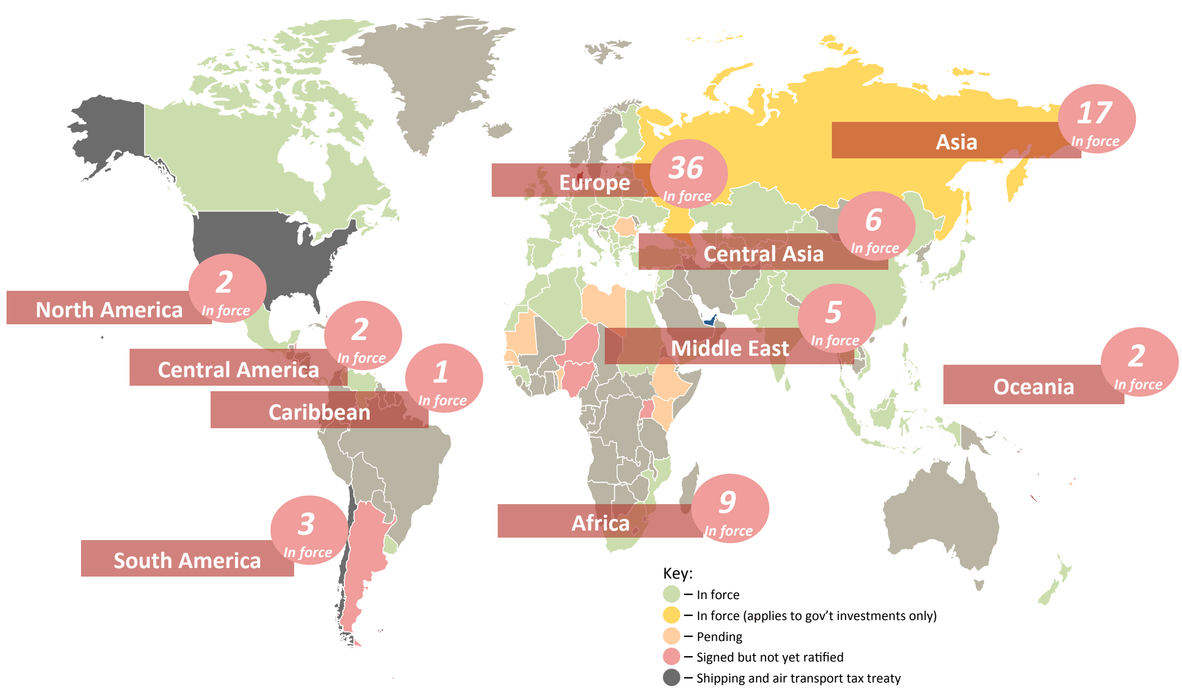
Comparison of ADGM with other leasing centres (2 of 2)

	Cayman Islands	Hong Kong	Ireland	Singapore	ADGM
Corporate tax rate	No corporate tax imposed in the Cayman Islands	16.5% (will be reduced to 8.25% under new tax regime)	12.5% (25% for non-trading income)	17% (5/10% for approved aircraft lessors)	0% corporate income tax
Tax depreciation	N/A	A lessor is not normally entitled to claim tax depreciation in respect of aircraft acquisition costs for aircraft leased to non-Hong Kong based airlines	Lessors are entitled to claim tax depreciation on the cost of aircraft on a straight line basis at a rate of 12.5% per annum over eight years	Approved aircraft lessors can claim tax depreciation on the aircraft over 5 to 20 years (also may opt to depreciate an aircraft over 3 years under normal rules)	N/A
Withholding tax	No withholding tax	Interest: 0% Royalties: 4.95%	Interest: 20% (0% interest paid to EU or DTT country) Royalties: 0% (20% applies to patent royalties only)	Interest:15% (0% WHT on aircraft financing payments to offshore lenders) Royalties: 10%	No withholding tax
DTT network	0 DTTs in-force	34 DTTs in-force.	72 DTTs in-force.	81 DTTs in-force; 1 applicable shipping and air transport tax treaty.	81 DTTs in-force; 2 shipping and air transport tax treaties (additional 32 DTTs in various stages of negotiation, signature or ratification)
VAT/GST treatment	No VAT/GST	No VAT/GST	Aircraft lease rentals are generally zero-rated for Irish VAT purposes	Cross border leasing is generally zero-rated for GST purposes	VAT will come in on 1 January 2018. Cross border aircraft leasing is expected to be zero-rated
Is stamp duty applicable?	No	No stamp duty is payable	Stamp duty does not apply to aircraft leases	No stamp duty is payable	No
Substance requirements	No	Yes	Yes	Yes	No (certain level of local substance is required to benefit from UAE DTTs)
Applicability of transfer pricing legislation	No	There is no comprehensive transfer pricing legislation in Hong Kong	Yes	Yes	No

DTT application to ADGM entities – Example of ADGM value proposition (ADGM lessor)



Map of UAE double tax treaties by continent



According to Tax Notes database of in-force treaties as of 28 February 2017, subject to change

List of UAE DTTs[1]

List of UAE double tax treaties (income and capital)

In-Force DTTs (83)[1]					Pending DTTs (11)	Signed DTTs (but not yet ratified) (11)	Under negotiation (10)
Africa	Turkmenistan	***Europe***	Lithuania	***Central America***	***Ratified by both states** (4)*	***Africa***	***Africa***
Algeria	Uzbekistan	Albania	Luxembourg	Mexico	***Africa***	Burundi	Malawi
Egypt	***Asia***	Armenia	Macedonia[2]	Panama	Ethiopia	Equatorial Guinea	Tanzania
Guinea	Bangladesh	Austria	Malta	***South America***	Senegal	Gambia	South Sudan
Mauritius	Brunei	Belarus	Montenegro	Chile[5]	***Europe***	Nigeria	***Asia***
Morocco	China (P.R.C.)	Belgium	Netherlands	Uruguay	Andorra	Uganda	Maldives
Mozambique	Hong Kong	Bosnia and Herzegovina	Poland	Venezuela	Jersey	***Europe***	Nepal
Seychelles	India	Bulgaria	Portugal	***Oceania***	***Ratified by the UAE** (7)*	Kosovo	***Europe***
South Africa	Indonesia	Cyprus	Romania	Fiji	***Africa***	***Caribbean***	Croatia
Sudan	Japan	Czech Republic	Slovakia[4]	New Zealand	Benin	St. Kitts and Nevis	Guernsey
Tunisia	Korea (Rep.)	Estonia	Serbia		Comoros Islands	***North America***	Moldova
Middle East	Malaysia	Finland	Slovenia		Kenya	Bermuda	***Central America***
Jordan[2]	Pakistan	France	Spain		Libya	***South America***	Costa Rica
Lebanon	Philippines	Georgia	Switzerland		Mauritania	Argentina	***Oceania***
Syria	Russia[3]	Germany	Ukraine		***Middle East***	Ecuador	Australia
Yemen	Singapore	Greece	United Kingdom		Palestine	Paraguay	
Central Asia	Sri Lanka	Hungary	***Caribbean***		***Central America***		
Azerbaijan	Thailand	Ireland	Barbados		Belize		
Kazakhstan	Turkey	Italy	***North America***				
Kyrgyzstan	Vietnam	Latvia	Canada				
Tajikistan		Liechtenstein[2]	United States[5]				

1. According to Tax Notes as of 28 February 2017, subject to change (includes the UAE's transport tax treaties with Chile and the Unites States which provide an exemption for the leasing of aircraft on dry lease terms).
2. Effective from 1 January 2018.
3. Government Investment Income Tax Agreement only. The treaty is a non-standard treaty which relates to the dividend, interest and capital gains income of Governments and their financial or investment institutions only.
4. The DTT with Slovakia will enter into force on 1 April 2017, effective from 1 January 2018.
5. Exemption available for the leasing of aircraft on a bare-boat basis under the UAE transport tax treaty, provided the aircraft are operated in international traffic.

Comparison with other major global leasing centers

The tax treatment of leases depends on whether the lease is treated as an operating lease or a finance/capital lease. Under an operating lease, the lessee would typically recognise tax-deductible lease payments as and when they arise. Under a finance lease, payments made by the lessee would generally represent interest on the lease obligation and principal repayments.

Operating lease

Generally, aircraft operating lease payments fall within the royalties article of a DTT if the wording in the article includes "for the use of, or the right to use industrial, commercial, or scientific equipment". If the above "right to use" language is not included in the royalties article then the income should fall within the typically more favourable "shipping and air transport" or "business profits" articles that often provide an exemption from any WHT in the jurisdiction of the lessee (provided in the case of the "shipping and air transport" article, that the aircraft is operated in international traffic).

Finance lease

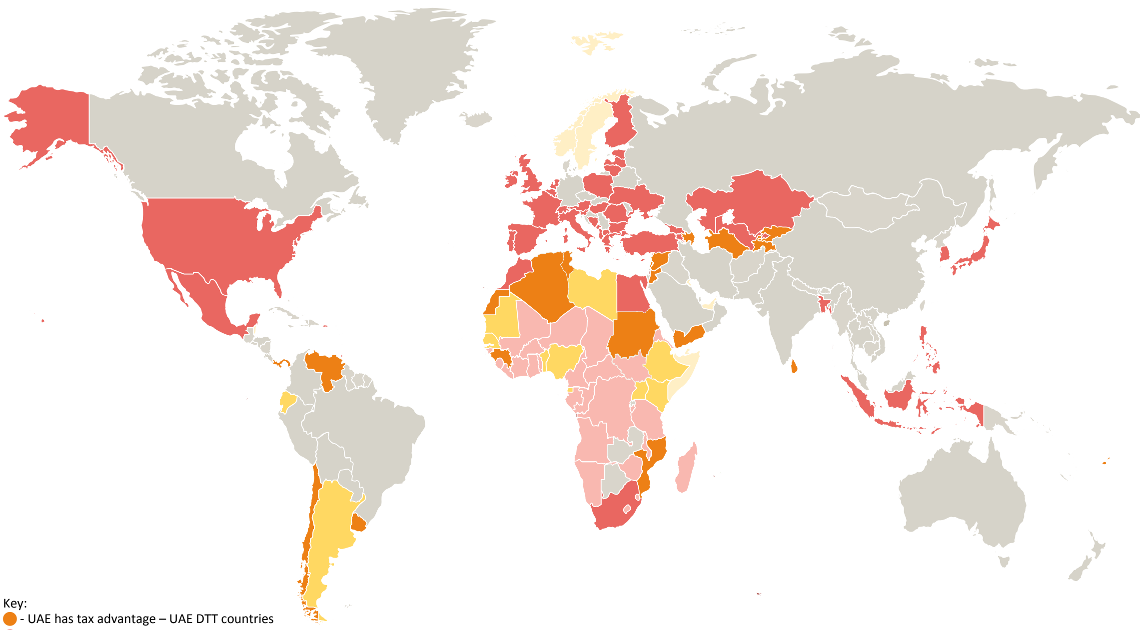
If a lease is treated as a finance lease then interest expense may be subject to WHT in the jurisdiction of the lessee. This WHT on interest may be reduced under the interest article of DTT.

Country	Number of DTTs in force[1]	Average network withholding rate (among all DTTs)[1,2]			% of DTTs where leasing income is exempt[3]	Additional transport tax treaties where leasing is exempt[4]	Substance for Tax Residency Certificate ("TRC")	DTTs containing Limitation of Benefits ("LOB")[5]	% of DTTs containing LOB
		Dividends	Interest	Royalties					
UAE	81 (113 incl. pending DTTs)	4.07%	3.18%	5.84%	63%	2	Yes	21	26%
Ireland	⇩ 72	⇧ 8.02%	⇧ 4.58%	⇩ 5.18%	⇩ 61%	⇩ 0	No	5	⇩ 7%
Singapore	= 81	⇧ 7.66%	⇧ 8.24%	⇧ 8.02%	⇩ 32%	⇩ 1	Yes	17	⇩ 22%
Hong Kong	⇩ 34	⇧ 5.56%	⇧ 5.37%	⇧ 5.91%	⇩ 41%	⇩ 0	No	15	⇧ 50%
Average of comparison jurisdictions	⇩ 62	⇧ 7.08%	⇧ 6.06%	⇧ 6.37%	⇩ 41%	⇩ 0	No	12	= 26%

Key: ⇨ Advantage UAE
⇨ Advantage other

1. According to Tax Notes database of in-force treaties as of 28 February 2017, subject to change.
2. Analysis does not take into account the EU Interest and Royalties Directive, which may provide additional relief beyond the treaty rate.
3. Analysis applies to Article 8 (Shipping and Air Transport) if this article contains the following wording "charter or rent", "charter or rental", "operation or rental of ships or aircraft", "rent", "rental or alienation" or "rental or chartering" but does not contain "incidental to the operation of ships or aircraft in international traffic".
4. Additional number of transport tax treaties which provide an exemption for aircraft leasing and no DTT currently exists.
5. Analysis applies only to English-language treaties which contain a clause entitled "limitation of/on benefits", "treaty shopping" or "main or principal purpose". Other provisions may exist.

Operating lease – summary of key findings



Key:
- UAE has tax advantage – UAE DTT countries
- UAE in comparable position – UAE DTT countries
- UAE in comparable position – UAE or comparison country has no DTT with the lessee jurisdiction
- UAE DTT has been signed and is pending ratification and will be stronger except for Bermuda, Jersey, Libya and Mauritania where there is no domestic WHT on royalties
- No domestic WHT on royalties

DTT and geographical positioning compared to all comparison jurisdictions

UAE tax and geographical positioning

UAE has tax advantage				UAE DTT equally strong as comparison jurisdictions						UAE equal to comparison jurisdictions (no DTT with UAE)					
Africa		*Central America*		*Africa*		*Caribbean*		Liechtenstein		*Africa*		Gambia*		South Sudan*	4
Algeria	6	Panama	6	Egypt	4	Barbados	6	Lithuania		Angola		Ghana		Swaziland	4
Guinea	6	*Oceania*		Mauritius	4	*Central America*		Luxembourg		Benin*		Guinea-Bissau		Tanzania*	4
Mozambique	4	Fiji	6	Morocco		Mexico		Macedonia		Burkina Faso		Ivory Coast		Togo	
Sudan	4	*South America*		South Africa	4	*Europe*		Malta		Burundi*		Kenya*	4	Uganda*	4
Tunisia	4	Chile**	6	*Central Asia*		Albania		Montenegro		Cameroon	4	Lesotho		Zimbabwe	4
Middle East		Uruguay	6	Kazakhstan	4	Austria		Netherlands		Canary Islands		Liberia		*Middle East*	
Jordan	4	Venezuela	6	Uzbekistan	4	Belgium		Poland		Cape Verde		Libya*		Bahrain	4
Lebanon	4			*Asia*		Bosnia and Herzegovina		Portugal	6	Central African Republic	4	Madagascar	4	Iran	4
Syria	4			Armenia	4	Bulgaria		Romania		Chad	4	Malawi*	4	Iraq	4
Yemen	4			Bangladesh	4	Cyprus		Slovenia		Comoros Islands*	4	Mali		Kuwait	4
Central Asia				Brunei		Estonia		Spain	6	Congo (Dem. Rep.)	4	Mauritania*		Palestine	4
Kyrgyzstan	4			Georgia	4	Finland		Switzerland		Congo (Rep.)	4	Namibia			
Tajikistan	4			Indonesia		France		Ukraine		Djibouti	4	Niger			
Turkmenistan	4			Japan		Greece		United Kingdom		Equatorial Guinea*		Nigeria*			
Asia				Korea (Rep.)		Hungary		*North America*		Eritrea	4	Senegal*			
Azerbaijan	4			Philippines		Ireland		United States**		Ethiopia*	4	Sierra Leone			
Sri Lanka	4			Singapore		Italy				Gabon	4	Somalia	4		
				Turkey	6	Latvia									

Highlighted in red, jurisdictions which have an in force DTT with the UAE only.

* UAE DTTs are at various stages of negotiation, renegotiation, replacement, amendments, signing, pending ratification, etc. and yet to be in-force.

** Exemption available under the UAE transport tax treaty, provided the aircraft is operated in international traffic.

4 UAE has geographical advantage over comparison jurisdiction(s).

6 UAE is second best from geographical prospective but has tax advantage over jurisdiction with closest proximity.

UAE DTT positioning with comparison countries

Source country	Ireland	Singapore	Hong Kong
Africa			
Algeria	✔	✔	✔
Egypt	=	✔	✔
Guinea	✔	✔	✔
Mauritius	✔	=	✔
Morocco	=	=	=
Mozambique	✔	✔	✔
Seychelles	✔	×	✔
South Africa	=	=	=
Sudan	✔	✔	✔
Tunisia	✔	✔	✔
Middle East			
Jordan	✔	✔	✔
Lebanon	✔	✔	✔
Syria	✔	✔	✔
Yemen	✔	✔	✔
Central Asia			
Kazakhstan	✔	=	✔
Kyrgyzstan	✔	✔	✔
Tajikistan	✔	✔	✔
Turkmenistan	✔	✔	✔
Uzbekistan	=	=	✔
Asia			
Armenia	=	✔	✔
Azerbaijan	✔	✔	✔
Bangladesh	✔	=	✔
Brunei	✔	=	✔
China (P.R.C.)	×	×	×
Georgia	=	=	✔
Hong Kong	×	=	-
India	×	=	=
Indonesia	✔	✔	=
Japan	✔	✔	=
Korea (Rep.)	=	✔	✔
Malaysia	×	×	×
Pakistan	×	×	✔
Philippines	=	=	=
Russia	×	×	×
Singapore	=	-	✔
Sri Lanka	✔	✔	✔
Thailand	×	×	=
Turkey	=	=	✔
Vietnam	×	×	=
Caribbean			
Barbados	✔	=	✔
Central America			
Mexico	=*	✔	✔
Panama	✔	✔	✔
Europe			
Albania	=	=	✔
Austria	=	✔	=
Belarus	×*	=	✔
Belgium	=	✔	=
Bosnia and Herzegovina	=	✔	✔
Bulgaria	=	✔	✔
Cyprus	=	=	✔
Czech Republic	×	×	=
Estonia	=	✔	✔
Finland	=	✔	✔
France	=	=	=
Germany	×	×	✔
Greece	=	✔	✔
Hungary	=	=	=
Ireland	-	=	=
Italy	=	✔	✔
Latvia	=	✔	✔
Liechtenstein	=	=	=
Lithuania	=	✔	✔
Luxembourg	=	=	=
Macedonia	=	✔	✔
Malta	=	=	=
Montenegro	=	✔	✔
Netherlands	=	=	=
Poland	=	✔	✔
Portugal	=	=	=
Romania	=	✔	✔
Serbia	×	✔	✔
Slovakia	×	=	✔
Slovenia	=	=	✔
Spain	=	=	=
Switzerland	=	=	=
Ukraine	=	✔	✔
United Kingdom	=	=	=
North America			
Canada	×*	✔	=
United States*	=	=*	=
Oceania			
Fiji	✔	✔	✔
New Zealand	=	×	×
South America			
Chile*	✔	✔	✔
Uruguay	✔	✔	✔
Venezuela	✔	✔	✔

Key:
- ✔ UAE is in an advantageous position in comparison with relevant other jurisdiction
- = UAE is in an equal position in comparison with relevant other jurisdiction
- × UAE is in a disadvantageous position in comparison with relevant other jurisdiction
- * Exemption available provided the aircraft is operated in international traffic

DTT comparison with key jurisdictions

	Exempt under BP or SAT articles of DTT (0% WHT)					Royalties (where lease payments are not exempt under BP or SAT articles)							
Source country	UAE	Cayman Islands	Hong Kong	Ireland	Singapore	UAE	Cayman Islands	Hong Kong	Ireland	Singapore	Domestic WHT rate (royalties)	UAE DTT WHT rate (royalties)	Best comparison DTT rate (royalties)
Albania	44	0	0	44	44	n/a	0	0	n/a	n/a	15%	5%	5%
Algeria	4**	0	0	0	0	4**	0	0	0	0	9.6/24%[2]	10%	
Armenia	44	0	0	44	0	n/a	0	0	n/a	0	10%	5%	5%
Austria	44	0	44	n/a	n/a	n/a	0	n/a	44	4 5%	20%	0%	0%
Azerbaijan	n/a	0	0	0	0	6	0	0	0	0	0/14%[3]	10%	
Bangladesh	n/a	0	0	0	n/a	6	0	0	0	6	20%	10%	10%
Barbados	44	0	0	0	44	n/a	0	0	0	n/a	15%	0%	8%
Belarus	n/a	0	0	4*	n/a	6	0	0	6	6	15%	5%	5%
Belgium	44	0	44	n/a	n/a	n/a	0	n/a	44	4 3%[4]	30%	5%	0%
Bosnia and Herzegovina	4**	0	0	44	0	6**	0	0	n/a	0	10%	5%	0%
Brunei	4**	0	n/a	0	4**	6**	0	6	0	4**	10%	5%	5%
Bulgaria	44	0	0	44	n/a	n/a	0	0	n/a	4	10%	5%	5%
Canada	n/a	0	n/a	4**	n/a	6	0	6	6**	4 15%	25%	10%	10%
Chile	4*	0	0	n/a	n/a	n/a	0	0	6	n/a	20%	n/a	5%
China (P.R.C.)	n/a	0	n/a	n/a	n/a	4	0	6	4 6%[5]	46%[5]	10%	10%	5%
Cyprus	44	0	0	n/a	44	n/a	0	0	44	n/a	10%	0%	0%
Czech Republic	n/a	0	n/a	44	n/a	4[1]	0	4 10%	n/a	6	15/35%[6]	10%	5%
Egypt	n/a	0	0	n/a	n/a	6	0	0	6	4 15%	20%	10%	10%
Estonia	44	0	0	n/a	n/a	n/a	0	0	44[1]	4 7.5%	10%	0%	5%
Fiji	44	0	0	0	n/a	n/a	0	0	0	6	15%	10%	10%
Finland	44	0	0	44	n/a	n/a	0	0	n/a	4 5%	20%	0%	0%
France	n/a	0	44	n/a	n/a	44	0	n/a	44	44	33.33/75%[7]	0%	0%

Key:
- 4 – No domestic WHT or zero WHT rate available under DTT (aircraft)
- 4 – No domestic WHT or zero WHT rate available under DTT (parts/equipment)
- 6 – Further relief available under royalties article of DTT but not full exemption
- 4 – Further relief under DTT but not as favourable as comparison country or domestic WHT rate for equipment rental
- 4 – No further relief available under DTT (the lower or equal domestic rate will apply)
- 0 – No treaty; domestic rate applies

* Exemption available provided the aircraft is operated in international traffic
** Exemption available for the lease of aircraft under BP/SAT article but royalty WHT rate applies to parts/equipment

DTT comparison with key jurisdictions

Source country	Exempt under BP or SAT articles of DTT (0% WHT)					Royalties (where lease payments are not exempt under BP or SAT articles)							
	UAE	Cayman Islands	Hong Kong	Ireland	Singapore	UAE	Cayman Islands	Hong Kong	Ireland	Singapore	Domestic WHT rate (royalties)	UAE DTT WHT rate (royalties)	Best comparison DTT rate (royalties)
Georgia	44	0	0	44	44	n/a	0	0	n/a	n/a	5/15%[8]	0%	0%
Germany	n/a	0	0	44	n/a	4	0	0	n/a	6	15%	10%	8%
Greece	n/a	0	0	n/a	0	6	0	0	6	0	20%	5%	5%
Guinea	44	0	0	0	0	n/a	0	0	0	0	15%	0%	
Hong Kong	n/a	0	n/a	44	0	4	0	n/a	n/a	0	4.95%	5%[9]	3%
Hungary	44	0	44	n/a	n/a	n/a	044	n/a	44	44	0%	0%	0%
India	n/a	0	0	4**	n/a	4	0	0	4**	4	10%	10%	10%
Indonesia	n/a	0	n/a	0	n/a	6	0	6	0	4 15%	20%	5%	5%
Ireland	44	0	44	n/a	44	n/a	044	n/a	n/a	n/a	0%	0%	3%
Italy	4**	0	n/a	n/a	n/a	6**	0	4 15%	44	4	30%	10%	0%
Japan	44	0	44	n/a	n/a	n/a	0	n/a	4	4	10%	10%	10%
Jordan	44	0	0	0	0	n/a	0	0	0	0	10%	10%	
Kazakhstan	n/a	0	0	0	n/a	6	0	0	0	6[1]	15%	10%	10%
Korea (Rep.)	44	0	0	4*	n/a	n/a	0	0	4	4 15%	20%	0%	0%
Kyrgyzstan	4**	0	0	0	0	6**	0	0	0	0	10%	5%	
Latvia	n/a	0	0	n/a	n/a	4	0 15%	0 15%	44[1]	4 7.5%[9]	0/15%[10]	5%	0%
Lebanon	44	0	0	0	0	n/a	0	0	0	0	7.5%	5%	
Liechtenstein	44	0	44	0	44	n/a	0	n/a	04	n/a	0%	0%	3%
Lithuania	44	0	0	n/a	n/a	n/a	0 10%	0 10%	44[1]	4 7.5%[9]	0/10%[11]	5%	5%
Luxembourg	44	0	n/a	n/a	44	n/a	044	44	44	n/a	0%	0%	0%
Macedonia	4**	0	0	4*	0	6**	0	0	4	0	10%	5%	0%
Malaysia	n/a	0	n/a	n/a	n/a	4	0	6	6	6	10%	10%	8%

Key:
- 4 – No domestic WHT or zero WHT rate available under DTT (aircraft)
- 4 – No domestic WHT or zero WHT rate available under DTT (parts/equipment)
- 6 – Further relief available under royalties article of DTT but not full exemption
- 4 – Further relief under DTT but not as favourable as comparison country or domestic WHT rate for equipment rental
- 4 – No further relief available under DTT (the lower or equal domestic rate will apply)
- 0 – No treaty; domestic rate applies

* Exemption available provided the aircraft is operated in international traffic
** Exemption available for the lease of aircraft under BP/SAT article but royalty WHT rate applies to parts/equipment

DTT comparison with key jurisdictions

Source country	Exempt under BP or SAT articles of DTT (0% WHT)					Royalties (where lease payments are not exempt under BP or SAT articles)							
	UAE	Cayman Islands	Hong Kong	Ireland	Singapore	UAE	Cayman Islands	Hong Kong	Ireland	Singapore	Domestic WHT rate (royalties)	UAE DTT WHT rate (royalties)	Best comparison DTT rate (royalties)
Malta	44	0	44	44	n/a	n/a	044	n/a	n/a	44	0%	0%	3%
Mauritius	44	0	0	0	n/a	n/a	0	0	0	44	15%	0%	0%
Mexico	4**	0	n/a	4*	n/a	6**	0	6	6	6	25%	10%	10%
Montenegro	44	0	0	44	0	n/a	0	0	n/a	0	9%	10%	10%
Morocco	4**	0	0	n/a	n/a	4**	04	04	4[9]	4[9]	0%[12]	10%	10%
Mozambique	n/a	0	0	0	0	44	0	0	0	0	20%	0%	
Netherlands	44	0	n/a	n/a	n/a	n/a	044	44	44	44	0%	0%	0%
New Zealand	n/a	0	n/a	n/a	n/a	4	0	6	4 10%	6[1]	15%	10%	5%
Pakistan	n/a	0	0	44	n/a	4	0	0	n/a	4 10%	15%	12%	0%
Panama	4**	0	0	n/a	n/a	6**	0	0	6	6	12.5%	5%	5%
Philippines	n/a	0	0	0	n/a	4	0	0	0	4	7.5%	10%	15/25%
Poland	4**	0	0	44	n/a	6**	0	0	n/a	4	20%	5%	10%
Portugal	44	0	44	n/a	n/a	n/a	0	n/a	4	4	0/25/35%[13]	5%	10%
Romania	44	0	0	44	n/a	n/a	0	4	n/a	4 5%	16/50%[14]	3%	3%
Russia	n/a	0	44	44	44	4	0	n/a	n/a	n/a	20%	Gov't only	0%
Serbia	n/a	0	0	4**	0	6	025%	025%	6**	0	20/25%[15]	10%	10%
Seychelles	n/a	0	0	0	44	6	0	0	0	n/a	15%	5%	8%
Singapore	44	0	0	44	n/a	n/a	0 3%	0 2%	n/a	n/a	2/3%[16]	5%	5%
Slovakia	n/a	0	0	44	n/a	6	0	0	n/a	6	19/35%	10%	5%
Slovenia	44	0	0	44	44	n/a	0	0	n/a	n/a	15%	5%	5%
South Africa	44	0	44	44	44	n/a	04	n/a	n/a	n/a	0%/15%[17]	10%	0%
Spain	n/a	0	n/a	n/a	44	44	04	4[9]	4 8%[9]	n/a	0%[18]	0%	5%

Key:
- 4 – No domestic WHT or zero WHT rate available under DTT (aircraft)
- 4 – No domestic WHT or zero WHT rate available under DTT (parts/equipment)
- 6 – Further relief available under royalties article of DTT but not full exemption
- 4 – Further relief under DTT but not as favourable as comparison country or domestic WHT rate for equipment rental
- 4 – No further relief available under DTT (the lower or equal domestic rate will apply)
- 0 – No treaty; domestic rate applies

* Exemption available provided the aircraft is operated in international traffic
** Exemption available for the lease of aircraft under BP/SAT article but royalty WHT rate applies to parts/equipment

DTT comparison with key jurisdictions

Source country	Exempt under BP or SAT articles of DTT (0% WHT): UAE	Cayman Islands	Hong Kong	Ireland	Singapore	Royalties (where lease payments are not exempt under BP or SAT articles): UAE	Cayman Islands	Hong Kong	Ireland	Singapore	Domestic WHT rate (royalties)	UAE DTT WHT rate (royalties)	Best comparison DTT rate (royalties)
Sri Lanka	n/a	○	○	○	n/a	◐	○	○	○	🔴	15%	10%	15%
Sudan	🟢**	○	○	○	○	◐**	○	○	○	○	15%	5%	
Switzerland	🟢🟩	○	🟢🟩	n/a	🟢🟩	n/a	○🟢🟩	n/a	🟢🟩	n/a	0%	0%	0%
Syria	🟢**	○	○	○	○	🔴**	○	○	○	○	7%	18%[9]	
Tajikistan	🟢**	○	○	○	○	◐**	○	○	○	○	15%	10%	
Thailand	n/a	○	n/a	🟢**	n/a	🔴	○	🔴	🟡**	◐	15%	15%	8%
Tunisia	🟢**	○	○	○	○	◐**	○	○	○	○	15/25%[19]	7.5%	
Turkey	n/a	○	○	n/a	n/a	◐	○	○	◐	◐	20%	10%	10%
Turkmenistan	n/a	○	○	○	○	◐	○	○	○	○	15%	10%	
Ukraine	🟢🟩	○	○	🟢🟩	n/a	n/a	○	○	n/a	🟡	15%	0%[1]	7.5%
United Kingdom	🟢🟩	○	🟢🟩	n/a	🟢🟩	n/a	○🟢	n/a	🟢🟩	n/a	0%	0%	0%
United States	🟢*	○	○	🟢🟩	🟢*	n/a	○	n/a	n/a	n/a	30%	n/a	0%
Uruguay	n/a	○	○	○	○	◐	○	○	○	○	12%	5%	
Uzbekistan	🟢🟩	○	○	🟢🟩	🟢🟩	n/a	○	○	n/a	n/a	20%	10%	5%
Venezuela	🟢**	○	○	○	○	◐**	○	○	○	○	34%	10%	
Vietnam	n/a	○	n/a	🟢🟩	n/a	🔴	○	🔴	n/a	◐	10%	10%	5%
Yemen	🟢**	○	○	○	○	🔴**	○	○	○	○	10%	10%	

Key:
- 🟢 – No domestic WHT or zero WHT rate available under DTT (aircraft)
- 🟩 – No domestic WHT or zero WHT rate available under DTT (parts/equipment)
- ◐ – Further relief available under royalties article of DTT but not full exemption
- 🟡 – Further relief under DTT but not as favourable as comparison country or domestic WHT rate for equipment rental
- 🔴 – No further relief available under DTT – the lower (or equal) domestic rate will apply
- ○ – No treaty; domestic rate applies

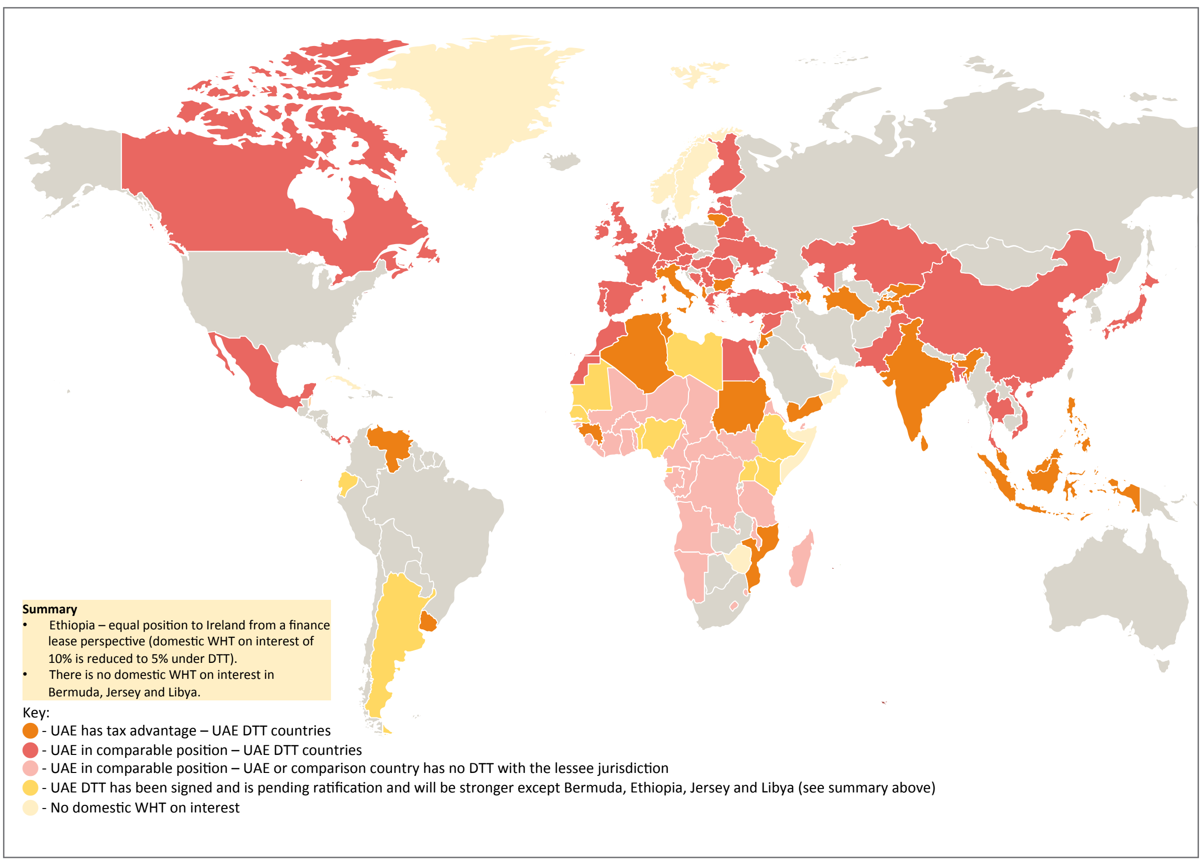
* Exemption available provided the aircraft is operated in international traffic
** Exemption available for the lease of aircraft under BP/SAT article but royalty WHT rate applies to parts/equipment

DTT comparison with key jurisdictions

1. A most favoured nation clause may be applicable with respect to royalties;
2. Royalties paid for the use of industrial equipment in the frame of an international leasing contract is subject to a tax allowance of 60% applied on the basis of such WHT. Thus, the effective tax rate of WHT will be 9.6% = 24% * (1 – 60%);
3. Rental income and royalties are subject to a 14% rate. However, there is a potential exemption if a non-resident lessor of aircraft is tax resident of a state which has a DTT with Azerbaijan;
4. In the case of equipment leasing, the 5% rate is levied on 60% of the gross amount of royalties.
5. If the operating lease payments are treated as royalties for the use of (or the right to use) industrial, commercial, or scientific equipment, the rate applies on 60% of the gross amount of the lease payments;
6. Royalties paid to non-residents are subject to WHT at a rate of either 15% or 35% (section 36 of the ZDP). The 35% rate applies to royalties derived by recipients who are not resident in:
   - another EU member state or a European Economic Area (EEA) country; or
   - a country with which the Czech Republic has concluded (i) a DTT, (ii) a TIEA (Cayman Islands signed an Exchange of Information Agreement with the Czech Republic on 26 October 2012), or (iii) a multilateral agreement providing for exchange of information to which both the Czech Republic and that country are a party.
7. A 331/3% WHT is levied on the gross amount of patent royalties paid by resident companies to non-resident companies. This WHT is not final; it is credited against the corporate income tax assessed under the general rules, but any excess is not refundable. With effect from 1 January 2013, a 75% WHT (previously 50%) applies to royalties paid to companies situated in a non-cooperative state or territory (NCST), unless the paying company proves that the payments are not motivated by tax avoidance;
8. Payments of royalties and other non-specified services from a Georgian source to an entity registered in a tax haven or offshore jurisdiction are subject to WHT at the rate of 15%;
9. The lower domestic rate will apply;
10. Payments for aircraft used in international flights and payments for the use of industrial, commercial, or scientific equipment are exempt. Royalty payments may attract WHT at a rate of 15% if they are made to companies in tax havens (includes companies registered in Cayman Islands and Hong Kong). In certain cases, the company may obtain State Revenue Service (SRS) relief from WHT, provided that the payment has not been made to reduce the taxable base;
11. Equipment rental are not subject to WHT. Anti-avoidance measures include the rules aimed at counteracting transactions with residents of listed tax havens (includes entities registered in Cayman Islands, Hong Kong and UAE). Payments made by Lithuanian entities to foreign entities registered or organised in a listed tax haven are not deductible for corporate income tax purposes, unless certain conditions are met;

12. As of 1 January 2011, payments made to non-residents for the right to use, chartering, rent and maintenance of aircraft operating in international traffic are exempt from the 10% WHT (article 6-I-C-4° of the GTC);
13. All royalties (including payments in respect of know-how, leasing of equipment and technical assistance) are subject to a 25% final WHT. A 35% WHT applies to royalties paid or made available to persons resident in a blacklisted jurisdiction without a permanent establishment in Portugal. However, there is a potential domestic exemption for payments made by public service companies (which includes certain airlines);
14. With effect from 1 January 2013, a 50% WHT applies to income paid to a country with which Romania does not have any signed convention providing for exchange of information, to the extent such payments result from artificial transactions;
15. Special WHT rules apply in case of non-resident entities from tax havens. WHT is payable at the rate of 25% on royalties, income from lease of immovable property and other assets, and service fees paid to non-resident entities from tax havens (includes companies registered in Cayman Islands and Hong Kong);
16. Rentals and charter fees paid to non-resident lessors of aircraft are subject to WHT of 2%. The WHT rate is 3% if paid to a resident of tax haven country (which includes Cayman Islands);
17. Non-residents that carry on business as an owner or charterer of ships or aircraft are exempt from income tax on their receipts and accruals derived from a source or deemed source located within South Africa (section 10(1)(cG)). The exemption only applies "if a similar exemption or equivalent relief is provided by the country of which such person is resident";
18. Aircraft lease rental income arising from aircraft operating in international air traffic is exempt from the income tax on non-residents (article 14 of the LIRNR); and
19. The WHT rate is increased to 25% if the non-resident recipient is based in a tax haven jurisdiction.

Comparison of ADGM with other leasing centres - finance lease



DTT and geographical positioning compared to all comparison jurisdictions

UAE tax and geographical positioning

UAE has tax advantage				UAE DTT equally strong as comparison jurisdictions						UAE equal to comparison jurisdictions (no DTT with UAE)					
Africa		Malaysia	6	***Africa***		***Central America***		Malta		***Africa***		Guinea-Bissau		Uganda*	4
Algeria	6	Philippines	6	Egypt	4	Mexico		Montenegro		Angola		Ivory Coast		Zimbabwe	4
Guinea	6	Sri Lanka	4	Mauritius	4	Panama	6	Netherlands		Benin*		Kenya*	4	***Middle East***	
Mozambique	4	***Caribbean***		Morocco		***Europe***	6	Portugal	6	Burkina Faso		Lesotho		Bahrain	4
Seychelles	4	Barbados	6	***Middle East***		Austria		Romania		Burundi*		Liberia		Iran	4
Sudan	4	***Europe***		Syria	4	Belarus		Serbia		Cameroon	4	Libya*		Iraq	4
Tunisia	4	Albania	6	***Central Asia***		Belgium**	6	Slovenia		Canary Islands		Madagascar	4	Kuwait	4
Middle East		Bulgaria	6	Kazakhstan	4	Bosnia and Herzegovina		Spain		Cape Verde		Malawi*	4	Palestine	4
Jordan	4	Italy	6	***Asia***		Cyprus		Switzerland		Central African Republic	4	Mali			
Lebanon	4	Lithuania	6	Armenia	4	Czech Republic		Turkey		Chad	4	Mauritania*			
Yemen	4	***Oceania***		Bangladesh		Estonia		Ukraine		Comoros Islands*	4	Namibia			
Central Asia		Fiji	6	China (P.R.C.)		Finland		United Kingdom**		Congo (Dem. Rep.)	4	Niger			
Kyrgyzstan	4	***South America***		Georgia	4	France		***North America***		Congo (Rep.)	4	Nigeria*			
Tajikistan	4	Uruguay	6	Hong Kong		Germany		Canada		Djibouti	4	Senegal*			
Turkmenistan	4	Venezuela	6	Japan		Greece				Equatorial Guinea*		Sierra Leone			
Asia				Pakistan	4	Hungary				Eritrea	4	Somalia	4		
Azerbaijan	4			Singapore		Ireland				Ethiopia*	4	South Sudan*	4		
Brunei	6			Thailand	6	Latvia				Gabon	4	Swaziland	4		
India**	6			Vietnam		Liechtenstein				Gambia*		Tanzania*	4		
Indonesia	6					Luxembourg				Ghana		Togo			

Highlighted in red, jurisdictions which have an in force DTT with the UAE only.

* UAE DTTs are at various stages of negotiation, renegotiation, replacement, amendments, signing, pending ratification, etc. and yet to be in-force.

** On the assumption that interest is paid by the borrower to a UAE bank or a similar financial institution, higher rates of WHT apply in all other cases.

4 UAE has geographical advantage over comparison jurisdiction(s).

6 UAE is second best from geographical prospective but has tax advantage over jurisdiction with closest proximity.

UAE DDT positioning with comparison countries

Treaty country	Ireland	Singapore	Hong Kong
Africa			
Algeria	✔	✔	✔
Egypt	=	✔	✔
Guinea	✔	✔	✔
Mauritius	✔	=	✔
Morocco	=	=	=
Mozambique	✔	✔	✔
Seychelles	✔	✔	✔
South Africa	×	×	=
Sudan	✔	✔	✔
Tunisia	✔	✔	✔
Middle East			
Jordan	✔	✔	✔
Lebanon	✔	✔	✔
Syria	=	=	=
Yemen	✔	✔	✔
Central Asia			
Kazakhstan	✔	=	✔
Kyrgyzstan	✔	✔	✔
Tajikistan	✔	✔	✔
Turkmenistan	✔	✔	✔
Uzbekistan	×	×	✔
Asia			
Armenia	=	✔	✔
Azerbaijan	✔	✔	✔
Bangladesh	✔	=	✔
Brunei	✔	✔	✔
China (P.R.C.)	✔	=	=
Georgia	=	✔	✔
Hong Kong	=	=	-
India*	✔	✔	✔
Indonesia	✔	✔	✔
Japan	=	=	=
Korea (Rep.)	×	=	=
Malaysia	✔	✔	✔
Pakistan	=	=	=
Philippines	✔	✔	✔
Russia	×	×	×
Singapore	✔	-	✔
Sri Lanka	✔	✔	✔
Thailand	=	=	=
Turkey	=	=	=
Vietnam	=	=	=
Caribbean			
Barbados	✔	✔	✔
Central America			
Mexico*	✔	✔	=*
Panama	=	=	✔
Europe			
Albania	✔	✔	✔
Austria	=	=	=
Belarus	=	=	✔
Belgium*	✔	✔	=*
Bosnia and Herzegovina	=	✔	✔
Bulgaria	✔	✔	✔
Cyprus	=	=	=
Czech Republic	=	=	=
Estonia	=	=	=
Finland	=	=	=
France	=	=	=
Germany	=	=	=
Greece	=	✔	✔
Hungary	=	=	=
Ireland	-	✔	=*
Italy	✔	✔	✔
Latvia	=	=	=
Liechtenstein	=	=	=
Lithuania	✔	✔	✔
Luxembourg	=	=	=
Macedonia	×	✔	✔
Malta	=	=	=
Montenegro	=	=	=
Netherlands	=	=	=
Poland	×*	✔	✔
Portugal	✔	=	=
Romania	=	✔	=
Serbia	=	✔	✔
Slovakia	×	×	✔
Slovenia	=	=	✔
Spain	=	✔	✔
Switzerland	=	✔	=
Ukraine	=	✔	✔
United Kingdom	=	=	=
North America			
Canada	=	=	=
Oceania			
Fiji	✔	✔	✔
New Zealand*	=	×*	×*
South America			
Uruguay	✔	✔	✔
Venezuela	✔	✔	✔

Key:

✔ UAE is in an advantageous position in comparison with relevant other jurisdiction

= UAE is in an equal position in comparison with relevant other jurisdiction

× UAE is in a disadvantageous position in comparison with relevant other jurisdiction

* On the assumption that interest is paid by the borrower to a bank or a similar financial institution, higher rates of WHT apply in all other cases

DTT comparison with key jurisdictions

	Interest							
Treaty country	**UAE**	**Cayman Islands**	**Hong Kong**	**Ireland**	**Singapore**	**Domestic WHT rate (interest)**	**UAE DTT WHT rate (interest)**	**Best comparison DTT rate (interest)**
Albania	4	0	0	6	6	15%	0%	5%
Algeria	4	0	0	0	0	10%	0%	
Armenia	4	0	0	4[1,3]	0	10%	0%	0%
Austria	4	04	4	4	4	0%	0%	0%
Azerbaijan	6	0	0	0	0	10%	7%	
Bangladesh	6	0	0	0	6	20%	10%	10%
Barbados	4	0	0	0	4	15%	0%	12%
Belarus	6	0	0	6	6	10%	5%	5%
Belgium	4[4]	0	4 0/10%[5]	4 15%	4 5%	30%	0/5%[4]	0%
Bosnia and Herzegovina	4	0	0	4	0	10%	0%	0%
Brunei	4	0	4[2]	0	4[2]	15%	0%	5/10%[2]
Bulgaria	6	0	0	0	4	10%	2%	5%
Canada	2	04	2	2	4 15%[10]	0/25%[6]	10%	10%
China (P.R.C.)	6	0	6	4	6 7/10%[2]	10%	7%	7%
Cyprus	4	04	04	4	4 7/10%[2]	0%	0%	0%
Czech Republic	4	0	4	4	4	15%/35%[7]	0%	0%
Egypt	6	0	0	6	4 15%	20%	10%	10%
Estonia	4	04	04	4	4	0%	0%	0%
Fiji	4	0	0	0	4	10%	0%	10%
Finland	4	04	04	4	4[10]	0%	0%	0%
France	4	04	4 10%[10]	4	4 10%[10]	0/75%[8]	0%	0%
Georgia	4	0	0	4	4	5%	0%	0%
Germany	4	04	04	4	4 8%[10]	0%	0%	0%
Greece	6	0	0	6	0	15%	5%	5%
Guinea	4	0	0	0	0	10%	0%	
Hong Kong	4[10]	04	n/a	4[10]	04	0%	5%[10]	0/10%[10]
Hungary	4	04	4	4	4[10]	0%	0%	0%

Key:
4 – No domestic WHT or zero WHT rate available under DTT
6 – Further relief available under interest article of DTT
4 – Further relief under DTT but not as favourable as DTT with comparison country
2 – Further relief under DTT but not as favourable as domestic WHT rate for finance leasing
4 – No further relief available under DTT – the lower (or equal) domestic rate will apply
0 – No treaty; domestic rate applies

DTT comparison with key jurisdictions

	Interest							
Treaty country	**UAE**	**Cayman Islands**	**Hong Kong**	**Ireland**	**Singapore**	**Domestic WHT rate (interest)**	**UAE DTT WHT rate (interest)**	**Best comparison DTT rate (interest)**
India	6[2]	0	0	4 10%	4 10/15%[2]	20%	5/12.5%[2]	10%
Indonesia	4[1]	0	4	0	4	20%	5%[1]	10%
Ireland	4	0	4 0/10%[4]	n/a	4 5%	20%	0%	0%
Italy	4	0	4 12.5%	4	4 12.5%	26%	0%	10%
Japan	6	0	6	6	6	20%	10%	10%
Jordan	6	0	0	0	0	10%	7%	
Kazakhstan	6	0	0	0	6[1]	15%	10%	10%
Korea (Rep.)	4	0	4 10%	4	4 10%	20%	10%	0%
Kyrgyzstan	4	0	0	0	0	10%	0%	
Latvia	6	0	0	2	2	0/5/15%[9]	2.5%	10%
Lebanon	4	0	0	0	0	10%	0%	
Liechtenstein	4	04	4	04	4	0%	0%	0%
Lithuania	4	0	0	4	4	10%	0%	10%
Luxembourg	4	04	4	4	4	0%	0%	0%
Macedonia	4	0	0	4	0	10%	5%	0%
Malaysia	6	0	4	4	4	15%	5%	10%
Malta	4	04	4	4	4 7/10%[2]	0%	0%	0%
Mauritius	4	0	0	0	4	0/15%[11]	0%	0%
Mexico	6 4.9%[2]	0	6 4.9%[2]	4 5%[2]	4 5%[2]	10/15/21%[12]	4.9/10%[2]	4.9/10%[2]
Montenegro	4[10]	0	0	4[10]	0 9%	9%	10%[10]	10%[10]
Morocco	4	0	0	4	4	10%	10%	10%
Mozambique	4	0	0	0	0	20%	0%	
Netherlands	4	0	4	4	4 10%[10]	0%	0%	0%
New Zealand	4	0	4[13]	4 10%	4[1,2]	15%	10%	0%
Pakistan	4	0	0	4	4 12.5%[10]	10%	10%	10%
Panama	6	0	0	6	6	12.5%	5%	5%
Philippines	6	0	0	0	4	10/20/30%[14]	10%	15%

Key:
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4 – No further relief available under DTT – the lower (or equal) domestic rate will apply
0 – No treaty; domestic rate applies

DTT comparison with key jurisdictions

	Interest							
Treaty country	UAE	Cayman Islands	Hong Kong	Ireland	Singapore	Domestic WHT rate (interest)	UAE DTT WHT rate (interest)	Best comparison DTT rate (interest)
Poland	4 5%	0	0	4 0/10%[15]	4 10%	20%	5%	0/10%
Portugal	6	0	6	4 15%	6	0/25/35%[16]	10%	0/10%
Romania	6	0	6	6	4 5%	16/50%[17]	3%	3%
Russia	4	0	4	4	4 7.5%	20%	Gov't only	0%
Serbia	6	0 25%	0 25%	6	0	20/25%[18]	10%	10%
Seychelles	4	0	0	0	4	15%	0%	12%
Singapore	4	0	0	4	n/a	15%	0%	5%
Slovakia	6	0	0	6 5%	4	19/35%	10%	0%
Slovenia	6	0	0	6	6	15%	5%	5%
South Africa	4	0	4 10%	4	4	15%	10%	0%
Spain	4	0	4 5%	4	4 5%	19%	0%	0%
Sri Lanka	6	0	0	0	6	20%	10%	10%
Sudan	4	0	0	0	0	7%	0%	
Switzerland	4	0	4	4	4 5%	35%	0%	0%
Syria	4	0	0	0	0	7.5%	10%[10]	
Tajikistan	4	0	0	0	0	12%	0%	
Thailand	4[1,2]	0	4 10/15%[19]	4 10/15%[19]	4[1,2]	15%	10/15%	10/15%
Tunisia	6[21]	0	0	0	0	5/20/25%[20]	2.5/5/10%[21]	
Turkey	4[10]	0	0	4[10]	2[2,10]	1%[22]	10%[22]	7.5/10%
Turkmenistan	4	0	0	0	0	15%	0%	
Ukraine	4[1]	0	0	4[1,23]	4 10%	15%	0%	0%
United Kingdom	4	0	4	4	4	20%	0%[2]	0%
Uruguay	6	0	0	0	0	12%	10%	
Uzbekistan	4	0	0	6	6	10%	10%	5%
Venezuela	6	0	0	0	0	4.95/34%[24]	10%	
Vietnam	4[10]	0	4[10]	4[10]	4[1,10]	5%	10%[10]	5/10%[10]
Yemen	4	0	0	0	0	10%	0%	

Key:
4 – No domestic WHT or zero WHT rate available under DTT
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4 – No further relief available under DTT – the lower (or equal) domestic rate will apply
0 – No treaty; domestic rate applies

DTT comparison with key jurisdictions

1. A most favoured nation clause may be applicable with respect to interest;
2. The lower rate applies to interest paid to a bank or financial institution;
3. The 0% rate applies to interest paid to the state or any institution wholly owned by the state. The 5% rate applies, inter alia, to interest paid to banks. The 10% rate applies in other cases;
4. The zero rate applies to payments to financial institutions;
5. The 0% rate applies, inter alia, to interest paid to banks and interest on commercial debt claims. Conditions may apply;
6. Interest paid to an arm's-length non-resident is exempt from WHT effective 1 January 2008. There is no WHT where the beneficial owner of the interest is resident in the other country and dealing at arm's length with the payer;
7. Czech-source interest paid to Czech tax non-residents is subject to 15% WHT, unless subject to domestic exemption or a DTT stipulates otherwise. Interest paid by Czech tax residents to entities that are residents of countries outside of the European Union and EEA, and countries with which the Czech Republic does not have an enforceable DTT or TIEA, are subject to 35% WHT;
8. In general, no WHT is levied on interest paid to non-resident companies. Only interest paid to a company located in an non-cooperative state or territory (NCST) is subject to a final WHT at a rate of 75%, unless the taxpayer proves that the payments are not motivated by tax avoidance;
9. With effect from 1 January 2014, interest paid to non-resident companies is exempt from WHT, except in the case of payments to tax haven (blacklisted jurisdictions) entities (includes entities registered in Cayman Islands and Hong Kong);
10. The lower domestic rate will apply;
11. There is no WHT in Mauritius for payments made by the holder of a Global Business Licence or Banking Licence to non-residents not carrying out any business in Mauritius;
12. 10% rate applies to interest paid to foreign government financing entities, to duly registered foreign banks and other entities that provide financing with funds obtained by issuing publicly traded debt instruments abroad, registered with the Ministry of Finance. Otherwise, a 15% or 21% WHT rate applies;
13. Interest is generally exempt if paid to an independent financial institution. Interest is generally subject to WHT of 30%. Interest on foreign loans – ie, those payable in foreign currency to offshore banking units and foreign currency deposit units – is subject to WHT at 10%. Any other form of interest on foreign loans payable to non-resident foreign corporations is subject to a WHT of 20%;
14. The lower rate applies to interest paid in connection with:
    - the sale on credit of any industrial, commercial, or scientific equipment;
    - the sale on credit of any merchandise by one enterprise to another; or
    - on any loan of whatever kind granted by the bank.

15. A 35% WHT applies to (i) interest paid to accounts held on behalf of non-identified third parties, and (ii) interest paid to persons resident in a blacklisted jurisdiction without a permanent establishment in Portugal. However, there is a potential domestic exemption for payments made by public service companies (which includes certain airlines);
16. With effect from 1 January 2013, a 50% WHT applies to interest paid to a country with which Romania does not have any signed convention providing for exchange of information, to the extent such payments result from artificial transactions;
17. An increased WHT of 25% applies to interest paid by resident entities to entities resident in a jurisdiction with a preferential tax regime (includes entities registered in the Cayman Islands and Hong Kong);
18. The 10% rate applies to (i) interest paid to a bank or financial institution (including an insurance company) and (ii) interest paid with respect to indebtedness arising as a consequence of a sale on credit of any equipment, merchandise, or services, except where the sale was between persons not dealing with each other at arm's length;
19. A reduced final WHT rate of 5% applies to interest paid to non-resident banks. The WHT rate is increased to 25% if the non-resident recipient is based in a tax haven jurisdiction;
20. The 2.5% rate applies if the beneficial owner of the interest is a financial institution; this rate will be raised to a maximum of 5% if Tunisia revises upward the rate provided under its domestic law. The 10% rate applies in other cases;
21. Finance leasing is subject to a WHT rate of 1%;
22. The rate of 5% applies to interest paid on loans granted by a bank. The zero rate applies to interest paid in respect of loans made, guaranteed or insured; or in respect of a debt claim guaranteed, insured or directly or indirectly financed by, or on behalf of, the government or any authorised agency; and
23. Interest paid to non-resident financial institutions is subject to a final WHT at the rate of 4.95%.

Countries with no DTT with the UAE

High-level comparison of jurisdictions with which the UAE has no DTT (1/3)

This section sets out the countries with which the UAE has no DTT, but that also do not have a DTT with any of the comparison jurisdictions (with very few exceptions). While this puts the UAE in an equal position from a DTT position, the UAE may have corporate tax, geographical or other advantages as a jurisdiction to serve these countries from.

High level comparison of jurisdictions with which the UAE has no DTT (1/3)

No UAE DTT available	UAE	Cayman Islands	Hong Kong	Ireland	Singapore	Royalties		Interest	
Country	(0% CIT)	(0% CIT)	(16.5% CIT)	(12.5/25% CIT)	(17% CIT)	Domestic	DTT	Domestic	DTT
Africa									
Angola	🔴	🔴	🔴	🔴	🔴	10%		5/10/15%	
Benin	🟡	🔴	🔴	🔴	🔴	12%		15%	
Botswana	🔴	🔴	🔴	🟢	🔴	15%	5%	15%	7.5%
Burkina Faso	🔴	🔴	🔴	🔴	🔴	20%		6%	
Burundi	🔴	🔴	🔴	🔴	🔴	15%		15%	
Cameroon	🔴	🔴	🔴	🔴	🔴	16.5%		15%	
Canary Islands	🔴	🔴	🔴	🔴	🔴	0%		0%	
Cape Verde	🔴	🔴	🔴	🔴	🔴	20%		20%	
Central African Republic	🔴	🔴	🔴	🔴	🔴	15%		15%	
Chad	🔴	🔴	🔴	🔴	🔴	25%		25%	
Comoros Islands	🟡	🔴	🔴	🔴	🔴	10%		10%	
Congo (Dem. Rep.)	🔴	🔴	🔴	🔴	🔴	20%		20%	
Congo (Rep.)	🔴	🔴	🔴	🔴	🔴	20%		20%	
Djibouti	🔴	🔴	🔴	🔴	🔴	10%		0%	
Equatorial Guinea	🟡	🔴	🔴	🔴	🔴	10%		10%	
Eritrea	🔴	🔴	🔴	🔴	🔴	10%		10%	
Ethiopia	🟡	🔴	🔴	🟢	🔴	5%	5%	10%	5%

🟢 – DTT in-force. 🟡 – DTT in various stages of negotiation, renegotiation, signature, ratification, translation or entry into force. 🔴 – No DTT.

High level comparison of jurisdictions with which the UAE has no DTT (2/3)

No UAE DTT available	UAE	Cayman Islands	Hong Kong	Ireland	Singapore	Royalties		Interest	
Country	(0% CIT)	(0% CIT)	(16.5% CIT)	(12.5/25% CIT)	(17% CIT)	Domestic	DTT	Domestic	DTT
Africa (cont'd)									
Gabon	🔴	🔴	🔴	🔴	🔴	20%		20%	
Gambia	🟡	🔴	🔴	🔴	🔴	15%		15%	
Ghana	🔴	🔴	🔴	🟡	🔴	15%		8%	
Guinea-Bissau	🔴	🔴	🔴	🔴	🔴	10%		10%	
Ivory Coast	🔴	🔴	🔴	🔴	🔴	20%		18%	
Kenya	🟡	🔴	🔴	🔴	🔴	20%		15/25%	
Lesotho	🔴	🔴	🔴	🔴	🔴	15/25%		15/25%	
Liberia	🔴	🔴	🔴	🔴	🔴	15%		15%	
Libya	🟡	🔴	🔴	🔴	🟢	0%	5%	0%	5%
Madagascar	🔴	🔴	🔴	🔴	🔴	10%		20%	
Malawi	🔴	🔴	🔴	🔴	🔴	15%		15%	
Mali	🔴	🔴	🔴	🔴	🔴	15%		15%	
Mauritania	🟡	🔴	🔴	🔴	🔴	0%		10%	
Namibia	🔴	🔴	🔴	🔴	🔴	10%		10%	
Niger	🔴	🔴	🔴	🔴	🔴	16%		15/20%	
Nigeria	🟡	🔴	🔴	🔴	🔴	10%		10%	
Rwanda	🔴	🔴	🔴	🔴	🟢	15%	10%	15%	10%
Senegal	🟡	🔴	🔴	🔴	🔴	20%		16%	
Sierra Leone	🔴	🔴	🔴	🔴	🔴	25%		15%	

🟢 – DTT in-force. 🟡 – DTT in various stages of negotiation, renegotiation, signature, ratification, translation or entry into force. 🔴 – No DTT.

High level comparison of jurisdictions with which the UAE has no DTT (3/3)

No UAE DTT available	UAE	Cayman Islands	Hong Kong	Ireland	Singapore	Royalties		Interest	
Country	(0% CIT)	(0% CIT)	(16.5% CIT)	(12.5/25% CIT)	(17% CIT)	Domestic	DTT	Domestic	DTT
Africa (cont'd)									
Somalia	🔴	🔴	🔴	🔴	🔴	0%		0%	
South Sudan	🔴	🔴	🔴	🔴	🔴	10%		10%	
Swaziland	🔴	🔴	🔴	🔴	🔴	15%		10%	
Tanzania	🔴	🔴	🔴	🔴	🔴	15%		10%	
Togo	🔴	🔴	🔴	🔴	🔴	15%		6%	
Uganda	🔴	🔴	🔴	🔴	🔴	15%		15%	
Zambia	🔴	🔴	🔴	🟢	🔴	20%	10%	15%	10%
Zimbabwe	🔴	🔴	🔴	🔴	🔴	15%		15%	
Middle East									
Bahrain	🔴	🔴	🟡	🟢	🟢	0%	0%; 5%	0%	0%; 5%
Iran	🔴	🔴	🔴	🔴	🔴	5/7.5%		5%	
Iraq	🔴	🔴	🔴	🔴	🔴	15%		15%	
Israel	🔴	🔴	🟡	🟢	🟢	26.5%	10%; 5%	25%	10%; 7%
Kuwait[1]	🔴	🔴	🔴	🟢	🔴	0%[1]		0%[1]	
Oman	🔴	🔴	🔴	🟡	🟢	10%	8%	0%	0%
Palestine	🔴	🔴	🔴	🔴	🔴	10%		0%[2]	
Qatar	🔴	🔴	🟢	🟢	🟢	5%	5%; 5%; 10%	7%	0%; 0%; 5%
Saudi Arabia	🔴	🔴	🟡	🟢	🟢	15%	8%	5%	0/5%

1. Kuwaiti tax law does not impose WHT. However, non-GCC companies earning Kuwaiti sourced income are subject to 15% corporate income tax, and the Kuwaiti payor may retain 5% of the contract payments.
2. A withholding tax of 10% is applicable for micro-leasing programs.

Jurisdictions with no domestic WHT on interest and/or royalties

Country	*Interest*	*Royalties*	*UAE DTT status*	*Geographic advantage*
Africa				
Canary Islands	0	0		
Djibouti	0			●
Libya	0	0	Pending	●
Mauritania		0	Pending	
Somalia	0	0		●
Zimbabwe	0			●
Asia				
Hong Kong	0		In force	
Macau	0	0		
Maldives	0		Pending	●
Caribbean				
Anguilla	0	0		
Aruba	0	0		
Bahamas	0	0		
British Virgin Islands	0	0		
Cayman Islands	0	0		
Cuba	0	0		
Curaçao	0	0		
Netherlands Antilles	0	0		
St Maarten	0	0		
Europe				
Austria	0		In force	
Andorra	0		Pending	
Cyprus	0		In force	
Estonia	0		In force	
Finland	0		In force	
Germany	0		In force	
Gibraltar		0		
Guernsey	0	0	Pending	
Hungary	0	0	In force	
Isle of Man	0	0		
Jersey	0	0	Pending	
Latvia	0	0	In force	
Liechtenstein	0	0	In force	
Luxembourg	0	0	In force	
Malta	0	0	In force	
Monaco	0	0		
Netherlands	0	0	In force	
Norway	0	0		
San Marino		0		
Sweden	0	0		
Switzerland		0	In force	
Middle East				
Bahrain	0	0		●
Kuwait	0	0		●
Oman	0			●
Palestine	0*		Pending	●
United Arab Emirates	0	0		
North America				
Bermuda	0	0		
Greenland	0			
Oceania				
Marshall Islands	0	0		
Vanuatu	0	0		
South America				
Suriname	0	0		

* *A withholding tax of 10% is applicable for micro-leasing programs*

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Fixed-wing and rotor-wing leasing – is it the same?

By Gwyn O'Flynn, a partner at Holland & Knight (UK) LLP in London.

"...a helicopter is an assembly of 40,000 loose pieces flying more or less in formation . . ."
Original source unknown

"...The thing is, helicopters are different from planes. An airplane by its nature wants to fly, and if not interfered with too strongly by unusual events or by an incompetent pilot, it will fly. A helicopter does not want to fly. It is maintained in the air by a variety of forces and controls working in opposition to each other. . ."
Harry Reasoner

"...Helicopters don't fly. They vibrate so badly the ground rejects them. . ."
Tom Clancy


Source: Google

Despite the above quotations, helicopters are wonderful machines. They are fast, graceful and have tremendous manoeuvrability. They can fly and land in places where fixed-wing craft cannot. They can be used for emergency medical service, search and rescue, news gathering, firefighting, police patrols and much more.

So, what are the differences that an aviation lawyer needs to be aware of?

Leasing

In terms of leasing, the structure of a helicopter lease is much the same as for a fixed-wing craft. It has the usual disclaimer, net lease, quiet enjoyment, indemnity, tax, assignment and default provisions and an equally vast number of conditions precedent and representations. You could take a fixed-wing lease off the shelf and use it for a helicopter and probably get away with it. However, there are some distinguishing features, and below are a few of the more discernible ones:

1. **Market value**: the value of a helicopter does not depreciate like a fixed-wing aircraft and can stay relatively static for the first 40 years of its life, mostly because of the constant regeneration of its parts (see below) and its lack of dependency on consumer demand/disposable income. In fact, according to the recently released HeliValue$ *Helicopter Blue Book*, some helicopter values have appreciated in recent years. As a further illustration, when the financial crisis hit in 2008, it is recorded that the value of fixed-wing aircraft dropped by more than 50% but helicopters apparently saw a fall of just over 10%, and then for 12 months only. As a consequence, a helicopter lease will very rarely have an annual agreed value reduction (unless it is pegged to the fair market value).
2. **Cape Town Convention**: the Convention does not recognise helicopter engines as "aircraft objects" when they are installed on the helicopter. When installed on the helicopter, the Convention views them as components only. This means that the engines, when installed, are covered by the same interests covering the airframe. Some leases will therefore prohibit the operator from installing the leased engines on any other airframe. But that is quite restrictive. The more usual way of dealing with the issue is to add a requirement in the lease for the registration of both an International Interest and a Prospective International Interest against the engines where the prospective interest covers the engines if and when removed from the airframe.
3. **Shorter lease term**: helicopter leases typically have lease terms of between three and five years only. This is because the leased helicopter is generally required to service a specific charter contract and those contracts usually have terms of three to five years. Many helicopter leases will have recurrent extension options, though, to coincide with the extension options often found in those charter contracts and/or to allow the operator to manage its fleet utilisation.
4. **Life**: helicopters can have a useful life of more than 50 years, and that equates to a lot of leases per helicopter over its life. Helicopters keep their value because they are made up of thousands of life-limited parts and components, each of which has to be replaced or overhauled at very regular intervals. For example, according to one authorised Robinson service centre, a Robinson R22 helicopter has to go into the shop for an engine service and oil change every 50 hours and has to have a full overhaul every 2,200 hours, which

overhaul apparently results in the helicopter being as-new for all practical purposes at the conclusion.

5. **Power by the hour**: helicopter leases will usually require the operator to cover the helicopter tip to tail (which just means airframe and engines) by maintenance contracts provided by the original equipment manufacturers (OEMs), although some non-OEM service providers are becoming more prominent and acceptable now. The benefits of those contracts are then assigned to the lessor for the duration of the lease and transferable to the lessor on lease expiry or on a default (either a maintenance contract default or a lease default). On expiry or a default, the lessor often has the right to become the customer under the contract with no buy-in fee and to claim ownership of the accrued reserves.
6. **Delivery conditions**: helicopters are typically leased as is. There is no lengthy list of conditions as typically seen in fixed-wing leases. Any issues discovered during inspection are usually addressed immediately by the lessor or the OEM pursuant to the applicable maintenance contract. The absence of detailed delivery conditions may be attributed to the maintenance contract position described above, of course, given that any issue is likely to be covered by and rectified pursuant to the maintenance contract. As with all aircraft, ensuring that the records are complete and up to date is most important because their condition will directly affect the value of the helicopter. If a lessee has satisfied itself as to the completeness of the records and the helicopter is covered by a maintenance contract, the inspection of the physical helicopter does not have to be extensive.
7. **Disassembly**: unlike fixed-wing aircraft, helicopters are very rarely flown to their final destination after lease commencement because of a range of issues. Instead, they are often disassembled immediately after delivery, wrapped in plastic, placed on the back of a truck, moved to a seaport or airport, shipped to the country of registration by sea or air, placed on the back of another truck at the destination, moved to the habitual base, reassembled and then inspected by the relevant aviation authority.

That process can take days or even months during which time the operator is paying full rental. There are even customised trucks designed to transport helicopters – see the link for examples and for an interesting promotional video showing an EC145 being loaded (http://imtbc.com/transport-services/helicopter-shipping/helicopter-transport-trailers/).

8. **Insurance liability**: unsurprisingly, given the differential in terms of passenger capacity and in terms of potential to cause third-party injury/damage, liability insurance for helicopters is required in the region of $50 million to $100 million only, compared with $500 million to $1 billion for fixed-wing aircraft. Surprisingly, all the other insurance requirements and coverages are exactly the same as those typically applicable to fixed-wing aircraft.
9. **Permitted area of operation**: helicopters are usually restricted to operation within the country of registration only, with prior written consent being required from the lessor for any operations outside of that country. In some instances, the area of permitted operation is even more restrictive, being defined by latitude and longitude borders or by specific square miles. Much of this is because of the more limited range of helicopters, but also because the helicopter is usually required to service a particular charter contract with operations already required for a limited area only in any case, such as to transport personnel to/from offshore oil rigs or to provide air ambulance services in a particular county.
10. **Subleasing**: save for inter-company subleases, these do not appear to be terribly common. This could be attributable again to the purposeful nature of the lease, but it is probably something to watch for the future. If lease terms get longer, demand gets greater and lessees start to see the potential to make profit from the exercise.

Lessors and manufacturers

There are just four main manufacturers of helicopters (in no particular order) – Bell, Sikorsky, Leonardo (formerly known as AgustaWestland) and Airbus Helicopters (formerly known as Eurocopter). Competition is strong between the four and they each have strong relationships with the leasing companies, often providing interesting and unique incentives to promote their helicopters over those of others, although choice is probably much more dependent on the lessee/operator's requirements and the intended mission.

There are just five main leasing companies (again, in no particular order) – Milestone Aviation Group, Lease Corporation International Helicopters, Waypoint Leasing, Lobo Leasing and Macquarie Rotorcraft.

Milestone Aviation Group was the first dedicated helicopter lessor to start up, in 2010. It reportedly started with just $500 million of capital and, according to its website, now has a helicopter fleet with a value of more than $4 billion. Before Milestone, operators leased to one another and purchased helicopters with bank loans. Nowadays, the banks prefer to lend to the lessors.

The future of helicopters

The latest innovation from Leonardo is the AW609 Tiltrotor, the first civilian tilt-rotor aircraft. It should be noted that these tilt-rotor craft have been used by the military for some time. It looks similar to any other turboprop aircraft, but the propellers can tilt allowing it to take off vertically like a helicopter and it can travel at twice the speed and with double the range of traditional helicopters. Go to the following link to be taken to the relevant page on the Leonardo website and the official video (http://www.leonardocompany.com/en/product-services/elicotteri_helicopters/aw609).

And we wonder if this concept will ever take off? Go to the following link for the answer (https://en.wikipedia.org/wiki/Hotelicopter).

An appetite for engines

When it comes to managing engine assets for lessors, technical knowledge, flexibility and quick execution are key, writes Alistair Dibisceglia, vice-president and head of leasing, MTU Maintenance Lease Services BV.

On an aircraft, engines are its most important assets. Top of the food chain, so to say. And they get tastier with age: when an aircraft is new, engines make up about 20% of the worth of the asset, but for an older aircraft, this can be up to 70%-80%. This is because engines are updated to current standards each time they go through a shop visit, meaning they devalue (if they devalue) in a different and slower way than an aircraft does. As such, they are valuable. It is also one of the many reasons engine leasing is growing: MTU Maintenance Lease Services estimates about 50% of engines are now owned by lessors.

But just because the engines are important, does not mean that a lessor or lessee wants to bind capital in these assets when they are mature. For instance, at the end of a long-term lease period, an airline might want to buy the aircraft but not invest in the engine. Or a lessor might not want to pay for a shop visit if it already has exit plans for the asset that are not in proportion to the cost of the visit and the engine life it would provide.

In both cases, MTU Maintenance Lease Services can help. The company steps in and either buys the engines and leases them back to the airline, for instance, or it provides a spare engine, exchange engine or perhaps just a module swap to the lessor, to help it avoid a shop visit but still have an airworthy engine. Either way, it is about maximising efficiency, speed of execution and, in the bottom line, cash.

Lease transitions: an acquired taste

MTU Maintenance Lease Services' appetite for engines is not just at the end of a lease. The company also has a taste for lease transitions, something that can put others off their food – because these have a reputation for being fraught with misunderstanding and costly.

In fact, according to a 2015 study by the International Bureau of Aviation, airlines spend an average of $1.65 million on extra costs related to each narrowbody redelivery to lessors, and overspend on widebodies can be twice that. Furthermore, the study highlighted that engines were the largest single cost component, with costs close to $600,000 attributed to the difference between agreed redelivery conditions and the actual state of the engine.

One reason for the overspend is the current complexity of lease returns. Their intricate nature stems from the fact that there are multiple elements to be considered during a transition: contractual agreements and obligations, costs, planning, timing and regulatory requirements.

The potential scope for difficulties is simply huge.

Alistair Dibisceglia, vice-president and head of leasing, MTU Maintenance Lease Services BV

Furthermore, three principle stakeholders are involved in a transition: the lessor, the current lessee and the next lessee. All parties want to achieve a smooth transition in a cost-effective way – one that does not leave them exposed afterwards. But they all have different needs. The lessor wants to protect the residual value of the asset, the current lessee wants to fly as long as possible and minimise cost and the next lessee does not want to be burdened with costs arising from previous usage.

MRO to go?

Nonetheless, lease transitions do not need to be like biting into a lemon, or worse, a fiery chilli. Having a competent partner such as MTU Maintenance Lease Services on board can take the heat out of all aspects of a transition – for instance, through a portable maintenance concept. Portability is about accurate engine assessment and appropriately performed maintenance being taken, ideally, "as is" by the next lessee and carried forward.

In turn, doing away with multiple borescope reinspections during transitions or life-limited parts being exchanged despite adequate greentime for further usage, for instance. Not only are transition costs reduced, operational costs for the duration the lessor owns the engine are also minimised.

While cost savings are a win for the operators, the issue of risk and exposure still remains. MTU Maintenance Lease Services protects residual value at all times and ensures maintenance reserves are correctly calculated and scalable according to usage.

Furthermore, lessors are concerned about the status of their asset and, more importantly, they want to know that any findings during transitions can be rectified without causing additional cost to them. The lessees, particularly those receiving the engine next, also do not want to be burdened with costs arising from previous usage. In such cases, correct contractual coverage is important. In this respect, MTU Maintenance Lease Services also offers unexpected engine removal coverage, which includes dealing with corrective action required by findings during an end-of-lease check, something not always guaranteed by other parties.

Other potential hairs in the soup

Many other factors can also contribute to hairy transitions. For instance, the scope for misunderstanding and miscommunication between parties is huge. Because an engine's history can be complex, and different people with different languages, technical experience and expectations are involved. Documentation and regulations can cause headaches: many lease transitions require full back-to-birth documentation of life-limited parts (LLPs), for instance.

Furthermore, project timing can be a cost-intensive issue, especially when the various steps in a transition are not activated at the right time. For example, if the process is delayed because an operator focuses more on flying than returning, and an engine remains in service into the period that should be used for the various transition checks. In fact, the IBA study also reported that 44.4% of late aircraft redelivery was down to underestimation of efforts required in redelivery processes. Additionally, the costs of engineering staff involvement in lease transitions (for each of the three parties mentioned above) can go into the hundreds of thousands. These costs usually do not make themselves known until it is too late.

Having a competent partner on board to manage these transitions can relieve the situation significantly and improve the speed of the redelivery process. MTU Maintenance Lease Services is more than happy to support with technical services such as reviewing records, digital archives, borescope reviews, shop visit planning and much more in this regard.

And for dessert?

Perhaps the cherry on the MTU portable maintenance cake – from a lessor perspective – is that maintenance reserves remain with the lessor during the term of coverage and are only drawn on at the time of a scheduled engine shop visit. The lessor remains in control at all times. Beyond this, MTU Maintenance Lease Services ensures that each and every engine covered under this programme is reserved appropriately and that the correct fees are collected in relation to specific operating conditions of the respective lessees. In turn, this provides complete peace of mind and risk mitigation to the lessor and lessee, because their engine is correctly reserved and there will be no shortfall when the next scheduled maintenance event occurs – avoiding any costly mistakes.

These all might sound like lofty marketing promises, so how can MTU Maintenance Lease Services be sure its secret sauce will do the trick? The company benefits from 36 years of maintenance, repair and overhaul (MRO) expertise – its employees are, quite simply, engine experts. Combined with an extensive airline network and in-depth market understanding, it is in a perfect position to provide solutions that everyone truly benefits from.

MTU Maintenance Lease Services commits to offering fast and flexible solutions to both lessors and lessees; whatever their appetite for engines.

Alistair Dibisceglia joined MTU Maintenance Lease Services BV as vice-president and head of global engine leasing this summer. He is responsible for commercial and technical activities. Alistair has more than 15 years' experience in the aviation industry, including senior roles in leasing and asset management at ILFC/AerCap, CastleLake and CALC. Having started his career as a technical director for an airline, Alistair combines extensive technical, leasing, asset management and MRO experience with in-depth, global market expertise. He holds a PhD in aerospace engineering from the Polytechnic of Milan.

MTU Maintenance Lease Services

In 2013, MTU Aero Engines founded two joint ventures with Sumitomo Corporation, one of the largest trading companies in Japan, to be able to better meet airlines' growing demand for leasing and financing solutions: MTU Maintenance Lease Services BV, with an MTU stake of 80%, and Sumisho Aero Engine Lease BV, with an MTU stake of 10%. Both companies have their headquarters in Amsterdam, Holland.

MTU Maintenance Lease Services offers short-term engine leasing, pooling and standby arrangements, as well as asset and material management, and lease-enhancement services. Sumitomo Aero Engine Lease offers long-term leasing and sale and leaseback financing. Beyond financial and leasing services, MTU Maintenance can provide flexible solutions for operators of leased engines too. For instance, the company helps with tailored end-of-lease services, logistical services and housekeeping – all the way to MRO, engine trend monitoring or LRU management.

Airfinance Journal's 2016 Deals of the Year Awards

We reveal the winners of our prestigious annual awards, recognising the most innovative deals, individuals and teams in aviation finance.

Overall deal of the year: **Bohai Leasing's takeover of Avolon**

Borrower/Issuer: Avolon
Amount: $7.6 billion
Structure: Sale of Avolon to Bohai Leasing
Advisors: JP Morgan, Morgan Stanley, Bravia Capital, UBS
Lawyers: Weil, Gotshal & Manges, Sidley Austin
Closed: 8 January 2016

Deal highlights

Shenzhen-listed Bohai Leasing closed the purchase of Irish-lessor Avolon on 8 January 2016. The $7.6 billion acquisition saw the subsidiary of the Haikou-based conglomerate HNA Group purchase the entirety of Avolon. At the time, the deal was the largest overseas transaction in history among China's A-share listed companies, and the second largest acquisition of a US-listed company and fifth largest acquisition overall among Chinese companies.

The deal was announced just nine months after Avolon's initial public offering (IPO) against a backdrop of volatile market conditions where the average share price movement was +3% among lessor peers in 2015, along with stagnant markets and falling oil prices.

Avolon delivered a 55% return to shareholders who invested in the IPO in December 2014 – a significant return exceeding all global market indices by a multiple. The IPO was the largest ever listing on the New York Stock Exchange (NYSE) by an Irish-founded company, and the company's exit via the Bohai acquisition was one of the shortest ever tenures on the NYSE. The merger with Bohai Leasing catapulted Avolon to the top five leasing firm in the world with a fleet of over 400 aircraft and gave it an equity injection of $1.2 billion to drive organic and acquisition growth.

Following the merger, Avolon is now the core leasing brand for Bohai Leasing and its parent HNA Group.

Avolon also assumed management of the Hong Kong Aviation Capital (HKAC) business. HKAC's fleet, processes and systems was fully incorporated into Avolon during the first half of 2016.

"It shows the efficiency and economies of scale when that can be achieved when you combine different platforms," said Avolon's chief financial officer Andy Cronin, speaking to *Airfinance Journal* about the deal.

He adds that one of the challenges of closing the deal was negotiating the differing regulatory requirements of the New York and Chinese stock exchanges.

"In China, there is a much higher level of regulation, with more diligence requirement. There is far more third party evidencing, so for example in the US if you buy an aircraft the regulators don't need to see a bill of sale for an individual aircraft, whereas in China they do. It's a much more forensic, bottoms-up regulation than in the US," he says.

Being part of a huge conglomerate like HNA Group has significant advantages for Avolon, Cronin says.

"From the manufacturers' perspective, we are part of a huge airline group as well as being part of a large multinational conglomerate. You need to look at HNA as significantly more than an airline," he says, pointing to the multiple acquisitions HNA Group has made in recent years. The most recent of these at the time of writing is HNA Group's acquisition of a 16.79% share of the Swiss travel retailer Dufry.

"HNA Group have grown that business from a start-up to be one of the largest companies in the world. They bring an expertise and a perspective on the industry, which is very unique and insightful," Cronin adds.

Avolon's transformation into a Chinese-owned leasing company raises the question of how much of its business will be devoted to China.

"We will track the market. I don't think we will be doing a disproportionate amount of on-shore Chinese financing," says Cronin.

"Chinese airlines often do finance leasing rather than operating leasing. Bohai has a significant finance lease business but Avolon does operating leasing, so we are obviously very well positioned to do a significant amount of operating leasing business in China."

Kartik Hariharan, executive director, Morgan Stanley says the challenges of the deal were "numerous", including the crossborder nature with parties in various geographies, absolute size of the financing and the carve-out nature of the financials that made valuation complicated. Additionally, tax related structuring issues surfaced at the later stages.

"Having a highly experienced and deal savvy management team at Avolon and Bohai made it easier and faster to deal with the challenges," Hariharan says, adding that the deal showed the ability of Chinese acquirers to pull off complicated cross-border merger and aquistions.

"Finally, it showed that Western debt financing markets love the aircraft leasing space, as evidenced by attractive borrowing rates achieved by Avolon during the financing transaction."

The **Avolon-Bohai deal team**, *and Bertrand Grabowski, special advisor to DAE and one of AFJ's independent judges*

Airline treasury team of the year: **American Airlines**

American Airlines scoops the prize this year for carrying out major investment in its fleet and for using a broad range of financial structures.

Last year, the airline invested $4.4 billion in new aircraft, comprising 55 new mainline and 42 new regional aircraft. It took advantage of historically low interest rates to finance this fleet renewal and tapped a variety of markets.

The airline has been a prolific issuer of enhanced equipment trust certificates (EETC) for years, but in 2016 it tapped this market more than any other airline by issuing $2.8 billion in three separate EETC deals. The deals were well priced, with an average fixed interest rate of 3.63%.

"Something like 37% of the outstanding EETC paper was issued by an entity that is now subsumed within American Airlines," says Tom Weir, vice president and treasurer at the airline. "We were mindful of the potential that we could go to that market too often. But right now, there's no obvious pricing penalty that we're paying for over-allocating our financing to that market," he adds, noting that there was plenty of

The **American Airlines treasury team**, *collecting their award from AFJ's editor* **Jack Dutton**

Asian appetite for recent EETC deals.

The airline also closed $1.8 billion in other loans, bearing interest at fixed and variable rates of LIBOR plus margin, which averaged 2.96% at the end of the year.

On top of this, the airline issued $844 million of special facility revenue bonds ("JFK bonds") via the New York Transportation Development Corporation (a special vehicle that issues debt for infrastructure projects), to refinance a prior issuance. The deal was rated "BB" by Fitch Ratings, which is one notch higher than the airline's long-term issuer default rating. This is due to the strategic importance of American's position at JFK airport.

"The repricing of the JFK bonds was a very good transaction for us. We felt we had good cooperation from the port authority and I think our timing was very good," adds Weir.

The deal involved bringing together local authorities and lenders in a complicated deal. But it closed successfully despite the number of parties involved.

American Airlines also tapped the capital markets in August 2016 through a private placement covering two Boeing 737-800 deliveries. BNP Paribas acted as the sole structuring and placement agent. This transaction was to diversify funding sources and gain access to a new investor base different from the typical investor base for public EETC issuances. It was the first primary issuance by American Airlines to be placed with Japanese investors. The transaction features straight line amortisation for the senior and junior notes, one Japanese rating agency (Rating & Investment Information, Inc.), and Reg S format.

Lessor treasury team of the year: **AerCap**

The year 2016 was a pivotal one for operating lessor AerCap. The lessor was upgraded to investment grade by two ratings agencies, it diversified its financing sources and re-priced several deals. In February 2017, AerCap won an investment grade rating from a third agency, reflecting the improvements it made throughout the year.

The lessor closed $4.6 billion in new deals in 2016, bringing the total amount of financing raised to $27 billion since it announced the acquisition of ILFC at the end of 2013. It also sold 141 aircraft and recorded $2.37 billion in proceeds from the sale or disposal of assets - $800 million more than the year before.

"We continued to focus on proactive portfolio management initiatives, which have resulted in executing over $3 billion in asset sales. This, combined with signing a record 279 lease agreements, illustrates the scale of AerCap's platform and the expertise of its people," said AerCap's chief executive officer Aengus Kelly.

Explaining their decisions to upgrade the lessor, the ratings agencies noted AerCap's deleveraging efforts, declining average fleet age, and increasing number of unencumbered assets.

AerCap reduced its total debt by $2 billion to $27.7 billion in 2016. The lessor's adjusted debt/equity ratio was 2.7 down from 2.9 in 2015.

The Irish-based lessor ended the year with 1,566 aircraft that were owned, on order or managed. Its owned fleet's average age was 7.4 years and the average remaining contracted lease term was 6.4 years. AerCap teamed up for the first time with Financial Products Group (FPG) in 2016 to execute a Jolco structure. The senior debt was provided by SMTB and CA-CIB.

"We are most proud of developing the diversity of our funding sources and the successful completion of our first deals in the Korean market, in addition to adding Japanese operating lease with call option (Jolco) transactions to our liability structure", said Paul Rofe, group treasurer at AerCap.

This year, the lessor will try to build on its momentum to further improve its credit profile.

"We will continue to source diverse forms of long term committed financing from multiple geographies in addition to managing our liquidity profile," adds Rofe.

The **Aercap treasury team**, *collecting thier award from AFJ's editor* **Jack Dutton**

Aviation woman of the year: **Amelia Anderson**

American Airlines' managing director and assistant treasurer, Amelia Anderson, has been chosen as *Airfinance Journal*'s Aviation Woman of the Year based on a public nomination process, which ran through the month of February.

Anderson, whose team is responsible for the execution and administration of American's corporate debt, completing over $20 billion of financing transactions in the three years following the merger with US Airways in December 2013, won the process by an overwhelming majority of submissions received from the global aviation industry.

She is the first recipient of *Airfinance Journal*'s Aviation Woman of the Year award. In addition to her work at American, Anderson is known as the co-founder of Advancing Women in Aviation Roundtable (AWAR), a grassroots initiative working with senior executives to build awareness and develop strategies to promote the development and advancement of women leaders.

"In many ways I share this award with my AWAR co-founder, Dana Barta of Morgan Stanley," she says. Anderson also serves as co-chair of American Airlines' women's leadership

Amelia Anderson, *managing director and assistant treasurer, American Airlines*

programme, and she is actively involved in American Airlines' MBA recruiting process.

According to Anderson, one of the best ways to "drive change" for women starts with education and having more girls and young women engaging in "stem subjects" or science, technology, engineering and mathematics.

"When you look at women in CEO positions, they are disproportionately likely to hold degrees in engineering, math or computer science," Anderson tells *Airfinance Journal* in an interview. "So, yes, there is a strong link."

However, according to the Women in Science and Engineering (Wise) campaign's 2016 analysis of UK labour market statistics, women make up just 12.8% of the Stem workforce. The proportion had increased by only 0.2 percentage points since their analysis in 2012.

Anderson acknowledges the road to becoming a CEO is still a difficult one for women, with only 5% of company chiefs being female at Fortune 500 companies. She speaks globally through AWAR trying to raise awareness about the factors impacting women as they transition from entry level to middle management and then to the boardroom.

"Women tend to have those natural behaviours that lend themselves to team building and people development, but as you move up in an organisation, especially in operational or finance roles, you have to do more than just lead and develop your team, you also have to be able to compete and to go toe-to-toe with your competition," she says, adding: "Business is still a rough and tumble place, and there are times women have to be comfortable taking a tough stand. So, we need to recognise our traditional behavioural styles, and be aware of situations when those behaviours may need to change."

Anderson holds an MBA in corporate finance from Georgia State University in Atlanta, and a BS in finance and economics from the University of Alabama in Huntsville.

Young person of the year: **Ahsan Gulabkhan**

Having left university a little over 10 years ago, Ahsan Gulabkhan is now senior legal counsel at UK carrier Virgin Atlantic, where he oversees a broad range of legal matters including fleet financing, engineering, operations, airport issues and alliances and strategy.

Gulabkhan studied law at Nottingham University, graduating in 2005. He stayed there for law school and then joined Norton Rose as a trainee solicitor in 2007 (as it was then known, before its merger with Fulbright & Jaworski in 2013). He qualified in January 2009, into the asset finance team, which is where he gained his first experience in commercial aviation law. He joined Virgin Atlantic in September 2013, where he has since gained exposure to a number of challenging and innovative deals.

"It's been a very busy three years," he tells *Airfinance Journal*.

One stand-out deal was the £220 million ($283 million) Heathrow airport slots securitisation. This deal, which

Ahsan Gulabkhan, *senior legal counsel, Virgin Atlantic*

won the "New structures" category in AFJ's 2015 Deals of the Year, saw the airline attract blue-chip investors to an innovative, low-cost deal.

"It was not an easy transaction to do," Gulabkhan notes. "It involved setting up the subsidiary airline [Virgin Atlantic International – the issuer of the notes] which is not a small-scale operation. It took the best part of a year to do it, but being involved in a deal like that is one of those career highlights." Under his tenure at the airline, Virgin Atlantic has undertaken an ambitious re-fleeting programme that has seen it replace older Boeing 747s with new 787s. The airline has used a combination of cash purchases, sale and leasebacks and Japanese operating lease with call option (Jolco) financings.

For Gulabkhan, aviation has always been a passion: "I always knew that it was something that I wanted to do", he says. As a child, he collected aircraft magazines and, whenever at the airport, was "pressed up against the glass looking at the runway".

Since making it a career, he has made friends in the industry and enjoys the "wonderfully close-knit community" of professionals that he gets to meet on a regular basis. When he gets a chance, Gulabkhan enjoys squash, badminton and cricket. He also plays the guitar and enjoys food and travel. Having recently returned from a week's holiday in Barbados, he is now ready for the next milestone: getting married this August.

Lifetime achievement award: **Tom Budgett**

Tom Budgett, a partner at Berwin Leighton Paisner (BLP), wins this prestigious award for a career that has spanned 45 years.

Budgett graduated from Cambridge with an MA in law in 1969. He joined a provincial firm in 1970 and left for Clifford Turner (now Clifford Chance) in early 1973. He became a partner there in 1981 and stayed for another 20 years.

In 2001, feeling like he had enough of law, he left for investment banking, with a team that was acquired by Investec in 2002. He left the bank in 2006, "having noticed that everybody I was working with was probably younger than my oldest son." After that he returned to BLP, in 2006, where he remained until his retirement this March.

Commercial aviation finance has changed dramatically in the course of his career, and Budgett has played an important role in that change. In the last 10 years, he notes, operating leasing has become far more widespread. Far more investors are entering the space as aircraft become better recognised as a stable source of long-term income. And aircraft-backed capital markets products, traditionally seen only in the USA, have blossomed in other regions such as Europe and Asia.

L to R: **Tom Budgett**, *partner, Berwin Leighton Paisner collecting his award from AFJ's editor* **Jack Dutton**

Among decades of deals, Budgett is especially proud of advising on a couple of landmark transactions. He worked on a fully defeased European ECA-supported Japanese leveraged lease for an Indian carrier at a time when European ECAs were still new to the market.

This deal had every bell and whistle contemplated at that time. He also advised on CityJet's purchase of up to 32 Sukhoi Superjet in 2015, which was the first time that a European buyer had purchased that aircraft type.

Although formally retired, Budgett continues to work for a BLP service called Lawyers on Demand, which supplies legal advice on select projects. He intends to also focus on pro bono work by advising air ambulance services in the UK on their purchases and financing of helicopters. By offering his services for free, Budgett hopes to enable these charities to make substantial savings and direct more resources towards their important work.

"His global experience with Clifford Chance and as a banker with Investec, combined with his acute insight and judgement in problem-solving, has been an invaluable asset to clients and colleagues alike. His career contributions are proportionate to the explosive growth of the aircraft finance sector," says Russell Clifford, head of asset finance at BLP.

Colin Thaine, a consultant at the firm, adds: "We at BLP are proud to be associated with his accomplishments as a partner and consultant advising leading elements of the industry."

Most improved airline of the year: **United Airlines**

During the past two years, United's financial fundamentals have seen a significant improvement, according to *Airfinance Journal*'s Financial Ratings model.

The model evaluates four key ratios:

- **EBITDAR**: United's margin of 22.1% for 2016 was ahead of American's and just a touch behind Delta's;
- **Fixed charge cover**: United was ahead of American;
- **Liquidity**: United's position was a strong second place behind American;
- **Leverage**: United's at 2x (improved from 3.2x two years ago) also puts it in second place.

Underlying some of these improvements was strong operational performance. United set new all-time records for departure performance, arrival performance, completion factor and baggage handling.

United ended the year 2016 with $5.8 billion in unrestricted liquidity, including $1.35 billion of undrawn commitments under its revolving credit facility.

Operating cash flow was $5.5 billion and free cash flow $2.2 billion for 2016, permitting some reduction in debt.

The company continued to invest in its business through capital expenditures of $3.2 billion for the full year.

Gross debt balance at year-end, including capitalised operating leases, was $16.5 billion, about $600 million less than at the end of 2015.

The company has publicly stated that maintaining a strong balance sheet remains the top strategic priority which lends confidence that the balance sheet improvement will continue and that an investment grade rating should not be out of reach on a two-three year view.

L to R: **Jason Fein** *from United Airlines, collecting his award from AFJ's managing director* **Mike Duff**

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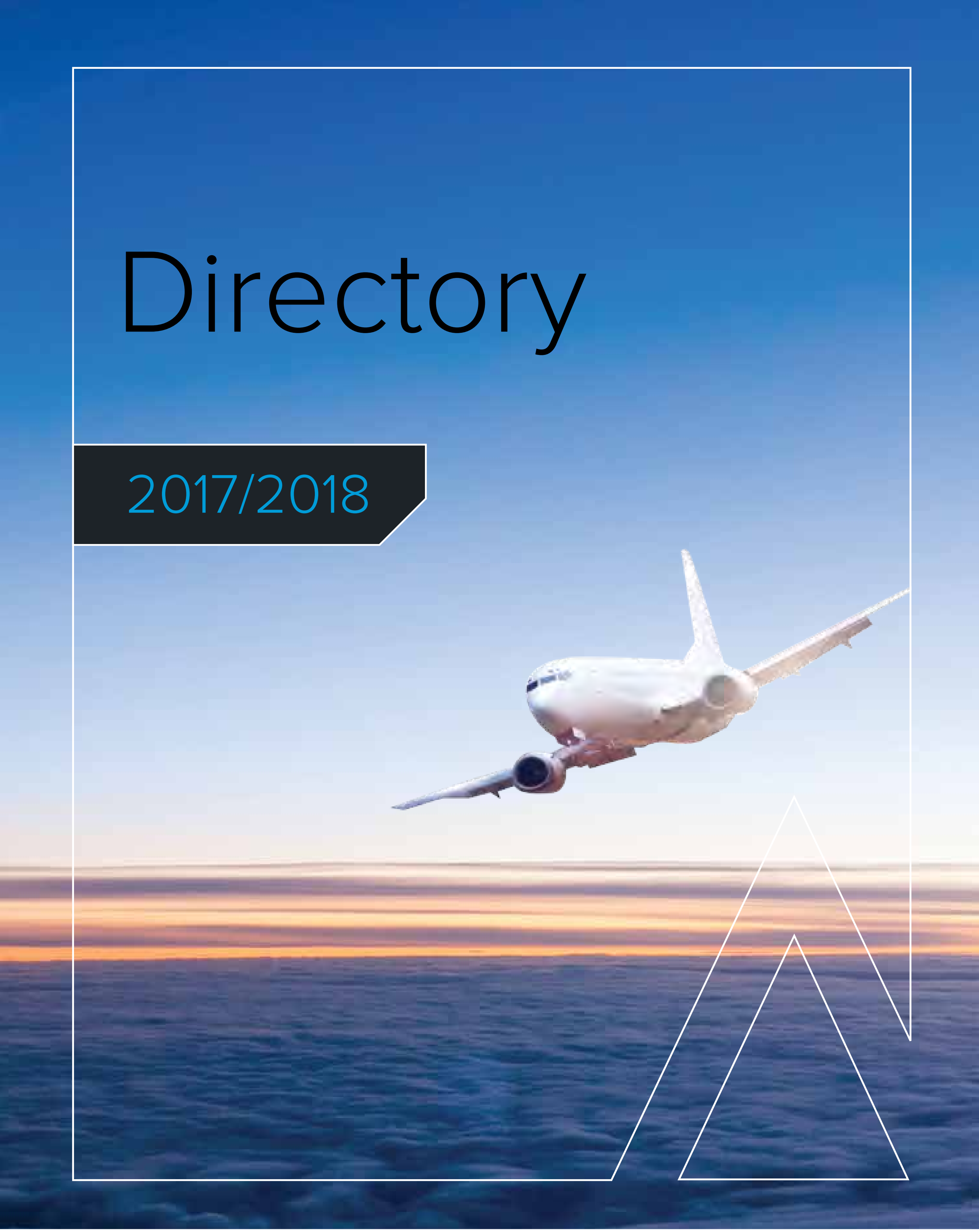

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A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

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Activities: Engine Leasing and Engine Financing

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Activities: Leasing

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Activities: High Court Enforcement

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Activities: Zeevo Group's global team of industry experienced professionals advise lessors, manufacturers, and airlines on a range of business operations, technology, internal control and software development matters.

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Activities: Export credit supported aircraft financing transactions