Aviation Leaders Report 2024

Demand & Disruption

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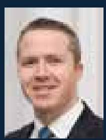

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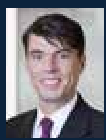

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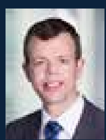

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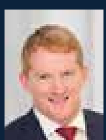

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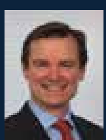

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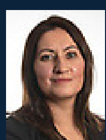

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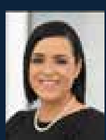

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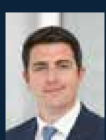

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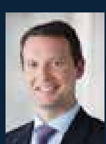

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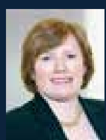

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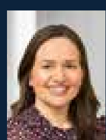

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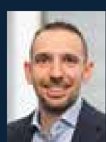

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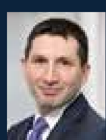

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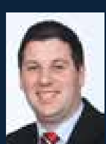

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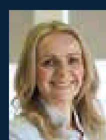

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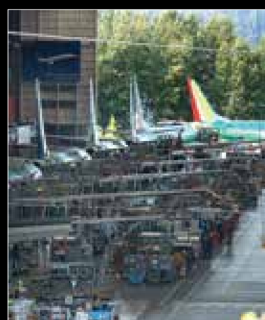

THE AVIATION LEADERS REPORT 2024

For the seventh year running *Airline Economics* and KPMG have gained insights into the commercial aviation industry through a series of in-depth interviews with major aviation leaders that delve into the real challenges facing the sector. This report details the main issues and perspectives shared by industry leaders in one insightful annual publication during one of the most difficult periods for the aviation industry.

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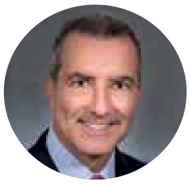

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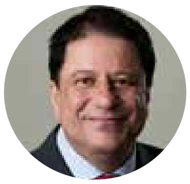

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ALL OF THE VIDEO INTERVIEWS, WHICH WERE CONDUCTED IN OCTOBER-DECEMBER 2023 IN VARIOUS GLOBAL LOCATIONS, ARE AVAILABLE TO VIEW IN FULL HERE: WWW.AVIATIONNEWS-ONLINE.COM/AVIATION-INDUSTRY-LEADERS-REPORT/

DEMAND & DISRUPTION

We are delighted to present you with our Aviation Leaders Report 2024: Demand & Disruption. The report captures the views of industry leaders across the leasing, airline and banking markets and includes input from rating agencies and analysts covering the sector.

Our report last year focused on the encouraging recovery that was taking place, primarily driven by US and European markets, and how the financing market was adapting to an environment where interest rates had begun to materially rise for the first time in over a decade.

The current environment is a very interesting place, where the significant tailwind of passenger demand is tempered by the many headwinds, not the least of which is the significant supply challenges the sector faces.

Airline performance and air traffic recovery

A new cycle begins. From the nadir of 2020 where airlines lost $140bn, IATA expects profits to return this year to the tune of over $23bn. This represents a remarkable turnaround and brings profitability close to 2019 levels. As ever, profits have been predominately driven by the US market (over $14bn), with European airlines driving the bulk of the balance ($7.7bn).

The recovery in 2022 was fragmented, with significant challenges remaining across Asia-Pacific, not least of which being the prolonged travel restrictions in China. With all restrictions now lifted, Asia has bounced back strongly and 2023 saw global air travel rise above 2019 for the first time. Given global GDP has increased significantly since that time, there remains a lot of growth to recapture.

While airlines around the world continue to be burdened with additional debt taken on during the pandemic, the strength of the recovery has meant that airline failures continue to be at a relatively low level, given historic norms. Load factors have been impressive and, assisted by the supply issues discussed below, pricing has been robust. The evident pent-up demand and the increased appetite for premium leisure travel have been compensating factors against any reduction in business travel.

The industry is not immune to the evident macroeconomic and geopolitical challenges, though after the challenges of Covid, it is almost reassuring to be talking about oil, labour, and finance costs. Labour has arguably been the most pressing of issues, with the global dearth of pilots driving that cost up significantly and general work force shortages impacting performance. Maintenance and the access to lift have also become increasingly challenging and place an ever-increasing risk to growth and profitability.

Despite these headwinds, the general view of participants is that airline performance should continue to be robust in 2024, as the heighted desire to travel persists and any potential US slowdown being offset by opportunities driven out of the Asian recovery.

OEM and Fleet Focus

The great disruption within the sector has been the current state of aircraft manufacturing. As airlines clamour for additional lift to service demand, production delays and equipment malfunctions are causing havoc.

On the aircraft OEM side, order books are stacked and sold out until the next decade, but ramping up supply chains has continued to be a struggle. While Boeing and Airbus delivered almost 1,200 aircraft in 2023, this remains over 20% below the peak of 2018. Given the continuing issues, the market lacks confidence in their ability to meet their stated targets.

For Boeing, there are further woes to manage for its 737 MAX and the fallout from the issues relating to the Alaska Airlines malfunction in January of this year remain to be seen. As the company increases its focus on quality and safety, production rates are likely to suffer in the near term.

Compounding the airframe issues are material concerns on the engine side. The full scale of the reliability issues with the Pratt & Whitney GTF engine came to light last September and will have a significant impact on those operating the A320neo. With already chronic backlogs in MROs and shop visits taking up to a year, it is forecast that there will be an average of 350 aircraft on the ground due to the GFT issues between 2024 and 2026, with the peak impact being felt in the first half of this year. The gross financial impact is forecast to be $6bn to $7bn and it leaves a number of airlines scrambling further for alternative lift. Compensation discussions will be interesting to observe.

It is estimated that the pandemic resulted in some 3,000 aircraft not being produced, coupling this with the supply challenges and the robust demand environment we are unsurprising seeing asset values materially increase across the board. Though it is worth noting that some lease encumbered assets may suffer from transactions that were written or extended nearer the outset of the pandemic.

The wider trading environment has suffered from these OEM challenges, as larger lessors delayed divesting plans as they are forced to wait on deliveries. The trading market improved somewhat over the course of 2023 and there is broad hope that this trendline will continue into this year.

Aviation Finance

Having seen sharp rises throughout 2022, interest rates broadly settled by the second half of 2023 at around 5% in the US and UK and 4% in the Eurozone. While inflation has declined sharply over the course of the year, there is an expectation that we are in a period of “higher for longer”.

That belief has provided more certainty to both lenders and borrowers and we saw an increase in issuances by the lessors in the unsecured bond market, with over $16bn raised in that market by both investment grade lessors and some lessors who hope to join that bracket in the near future. While interest rates reflected the heightened environment, it was interesting to note that spreads for lessors were not materially different than in recent years.

The wider commercial aviation debt market remains open for business, with many warehouse facilities closed over the last year and the continuing theme of alternative lenders, typically backed by US private equity, playing an increasingly important role in providing many forms of debt financing across the capital stack.

On the structured finance side, the market has not returned in a meaningful way, and this is impacting on asset managers ability to package and close transactions, whether in the form of ABS structures, sidecars or joint ventures.

As recently as 2021 the asset backed securitisation (ABS) market funded $9bn of aircraft purchases but it was effectively shuttered in 2022 after the Russian invasion of Ukraine and the interest rate hikes that followed. There was some life in that market in late 2023 with issuances on the engine and aviation loan side and there is hope that further activity will follow through in 2024 for the notoriously sentiment driven market. However, seeing that through will require a relatively clean portfolio, with attractive metal, stable lessees and leases that have been appropriately repriced for the current environment.

Lessors Dominate

Aircraft leasing companies have had a stellar year, with demand outpacing supply and leasing fundamentals improving substantially, increasing the bottom line for many of the larger lessors. Lease rate factors (LRFs) traditionally lag interest rate rises, but we are now seeing material increases in LRFs as they reflect the heightened interest rate and wider demand environment.

The demand for lease extensions has never been higher and the larger lessors with orderbooks are seeing commitments stretch a long way out. Together with the positive trend in asset values, it bodes well for the larger lessors to continue to grow their share of the market and drive shareholder returns.

The percentage of leased aircraft sits above 50% in terms of the number of aircraft owned by lessors and above 55% in terms of the overall value of the lease fleet. The dominant view remains that this percentage will likely continue to move towards the 60% mark over the coming years.

Given the increasing evident benefits of scale, from the access to deeper pools of capital to the ability to secure slots with OEMs, there is also a general belief that where M&A takes place it is likely to be larger players absorbing those that have not achieved investment grade status.

There will remain a place in the market for those outside that sphere, but the niches they operate in are becoming increasingly specialised and require a high level of expertise to execute effectively.

The Climate Challenge

The report delves less into the climate challenge than in prior years and that, in part, is due to a lack of new insights to give. The sector is aware of the challenges it faces and its responsibility to reduce its carbon footprint, but the path remains murky.

The availability of capital, either debt or equity, has not yet been materially impacted by ESG concerns and the great white hope of Sustainable Aviation Fuel needs to take a significant step forward in production if it is to play the key role that has been designated for it. We no doubt will return to this agenda in greater detail in future years.

In Closing

Overall, the industry outlook remains positive. Disruption is nothing new to this sector and, while the challenges it faces are significant, they still pale in comparison to what was overcome during the pandemic.

As we enter the next aviation cycle, we do so buoyed by the consumers increasing desire to travel and by the resilience the entire sector has displayed in recent times.

I would like to thank all those who gave their time and insights, and I hope you enjoy the read.

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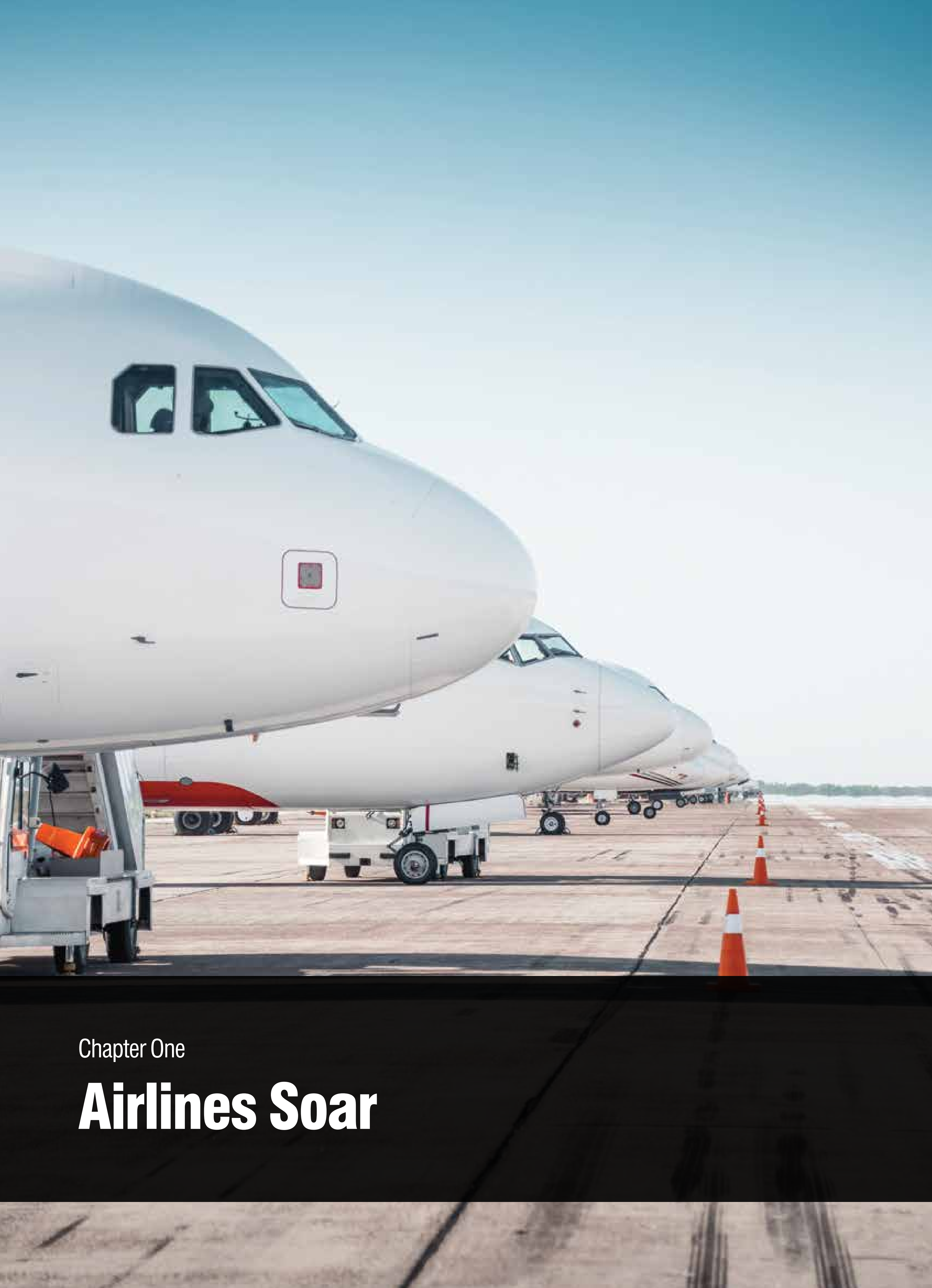


Chapter One

Airlines Soar

In times of volatility, economists search for constants to be able to better predict future growth patterns to inform current strategy. The airline industry is no exception and arguably has endured cycles of volatility caused by exogeneous shocks that have increased in frequency in recent years. The pandemic was the deepest recessionary shock the world economy has ever seen, so it is unsurprising that economists are seeking to modify established forecasting models for a post-pandemic world.

Historically, aviation economists have assumed that the industry has a standard economic cycle of two to three boom years followed by a downturn lasting several years before finally ticking back upwards. Many adhere to that premise despite a deep break in the cycle during the elongated period of growth in the years from around 2004 to the onset of the pandemic. Air travel growth continued despite the impact of the global financial crisis in 2008/9, which possibly even contributed to the continued expansion of the industry thanks to global central banks suppressing interest rates for a decade at close to zero leading to an inpouring of liquidity from investors searching for higher yields. Air travel's relationship to global gross domestic product (GDP) has been well documented but in those boom years, however that relationship may have decoupled since the global airline industry grew at more than 5% a year between 1990 to 2010 – outpacing global GDP by almost double and well in excess of the industry's long-term average. After the financial crisis, the industry's compound annual growth rate accelerated to 6.7% before the pandemic grounded the world fleet in 2020.

Speaking at an investor conference in December 2023, Delta Air Lines chief executive Ed Bastian discussed his view that the relationship between air travel and GDP has endured despite the "tremendous amount of volatility and variability and exogenous factors" that have influenced the industry. Bastian believes that the relationship between the size of the US economy and the amount that's spent on air travel to and from the US specifically has been consistent since the 1980s at "about 1.3%" although he notes this dropped during crisis years to 1.1% in the aftermath of 9/11 and the financial crisis before being "broken" by the pandemic. "The only time it has meaningfully broken in our modern history of US travel is the Covid crisis," said Bastian. "From the period of 2020 through 2022, there was about $300bn of missing demand when you look at the size of the economy, the wealth of our consumers, and the fact that consumers could not travel but they had the desire to travel. Just a substantial amount of demand was missing."

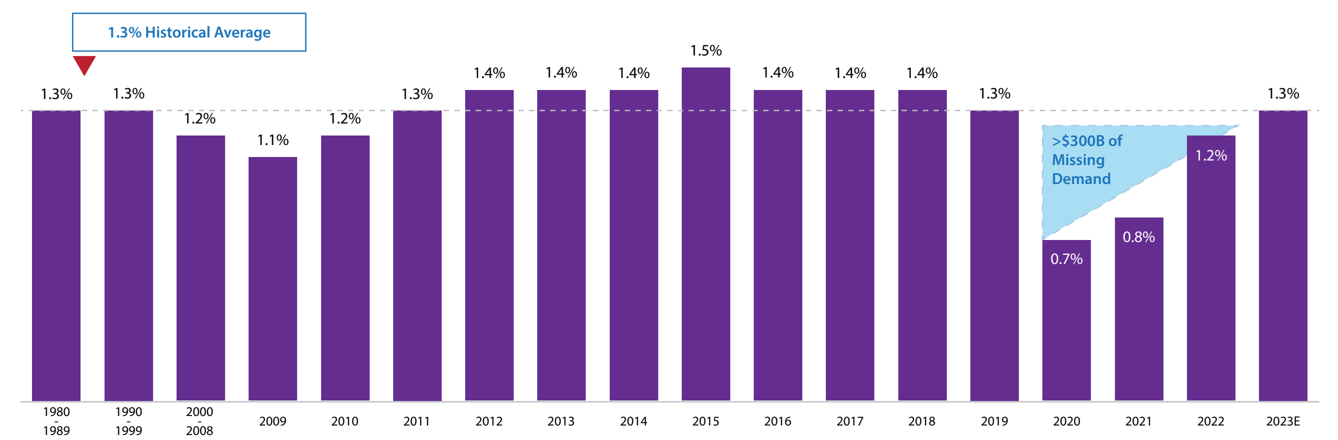
Bastian notes that "$300bn missing demand" from the pandemic period [Fig.1] is reflected in the rapid growth the industry has been experiencing over the past two years with so-called "revenge travel". He adds that the industry is only now "back to trend" implying that air travel has not yet "made a dent into that $300bn" predicting that airlines will continue to see healthy demand over the next several years.

Speaking with Airline Economics in March 2023, American Airlines treasurer Meghan Montana made a similar observation that the industry finished 2022 with revenue of 0.88 of US GDP, indicating there was still $30bn of lost revenue to recapture. While noting that it would not be possible to recapture all of that lost demand due to the continued supply and demand imbalance of aircraft that continues to restrict capacity today, she believes that it is possible for the industry to eclipse that historic 1% of GDP revenue given the strength of pent-up demand and the popularity of flexible working habits that in turn have provided more flexibility for travel.

Expanding this hypothesis to the global airline market, Figures 2 & 3 overleaf show the trend line between global GDP, air travel (measured in revenue per passenger kilometres, RPKs) and airline net profits from

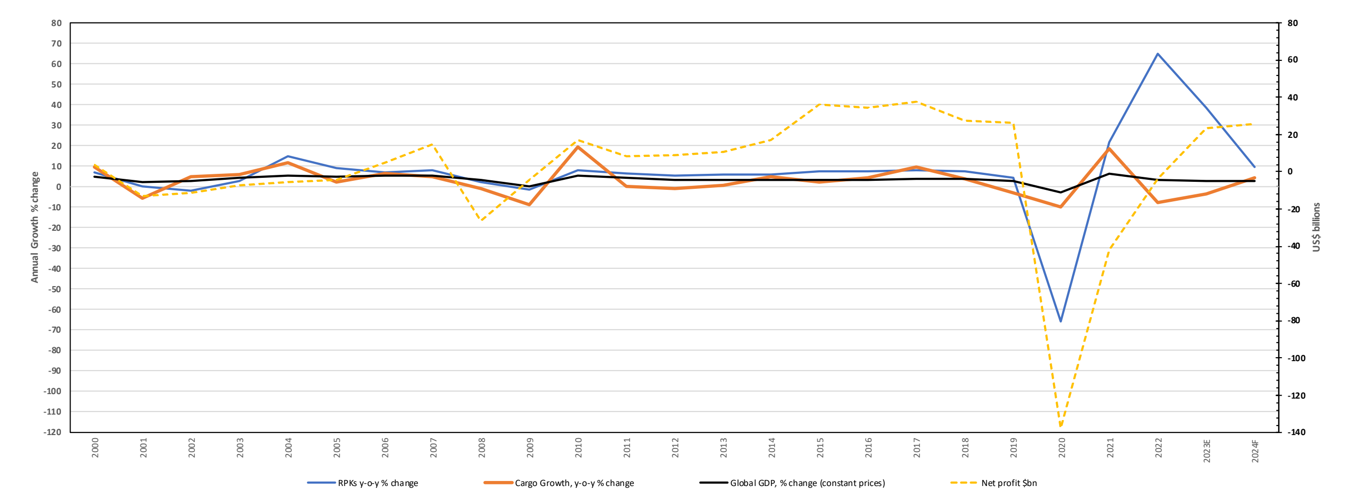
Air Travel Revenue Returning to Long-Term Trend

Industry Revenue to & from U.S. As % of GDP



Source: Delta Air Lines

FIG. 1: US AIR TRAVEL REVENUE V US GDP



Source: International Monetary Fund, World Economic Outlook Database, October 2023 | IATA Global Outlook for Air Transport - December 2023

FIG. 2: WORLD ECONOMIC GROWTH (GDP), AIR PASSENGER TRAFFIC (RPKS) AND AIRLINE PROFIT ($BN)

2000 to forecasts for this year. This publication argued in its first report, *Navigating the Cycle (2018)*, that the growth of air travel had become decoupled from global GDP growth as the product became more commoditised with the onset of more low-cost carriers, the growth of air travel in emerging markets and an elongated benign operating environment. The decoupling can be seen on Fig. 2 by divergence of the black GDP line and the yellow dotted net profit line from 2014-15 to the onset of the pandemic where any relationship was broken.

Ed Bastian argued that air travel has been evolving from what was becoming a commoditised industry and has pivoted to place a greater emphasis on premium travel revenue. "We lowered the price of using the premium products to attract more people," he said. "We have changed the whole core economics. It used to be that our front cabins were our loss leaders. Now our front cabins are our profit centres [which is] a huge paradigm shift. People underappreciate the transition that the industry has gone through in distributing those premium products after years of just racing to the bottom on the commoditisation. And we're still not done with that."

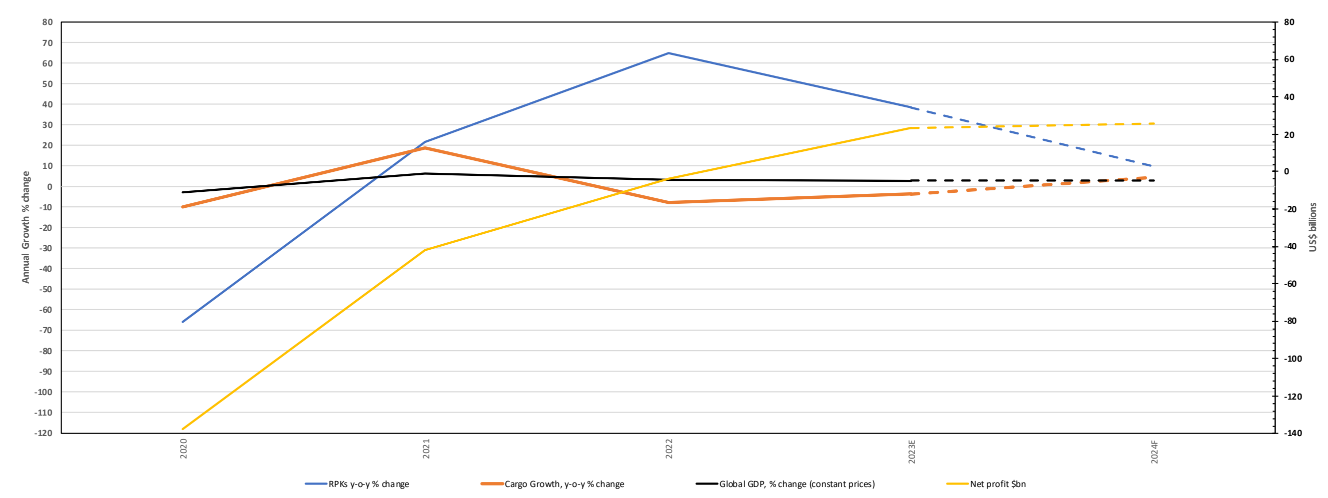
Airline CEOs are again utilising economic performance as the best indicator to predict future growth of air travel notwithstanding the constraints on capacity from the lack of new aircraft deliveries. The GDP forecast lines on Chart Three show the air travel projections (blue line showing RPK forecasts) once again converging with the black GDP forecast line. Net profits are expected to remain elevated as capacity constraints, pilot shortages and higher inflation work to keep fares and yields elevated.

Since air travel resumed, the rebound in the industry has been nothing short of remarkable. Following such a sharp downturn, expectations were that the recovery would be a protracted process but airline yields have continually outpaced most forecasts, the feared risk of recession in world markets has receded over the past year and growth has continued despite the war in Ukraine, which is now entering a third year. Full year results for 2023 are expected to show a strong year for airline profits driven by healthy passenger revenue.

The International Air Transport Association (IATA) reported in December that total airline (passenger and cargo) revenue in 2023 is estimated to have recovered to 107% of pre-pandemic levels, with exceptional 47% year-on-year growth pushing passenger revenue up to $642bn in 2023 [Fig.4]. IATA expects net post-tax profit to reach $23.3 billion in 2023, with a "slim" net profit margin of 2.6%. Although the recovery in traffic has been swift and inflation has caused yields to surpass forecast, IATA – while

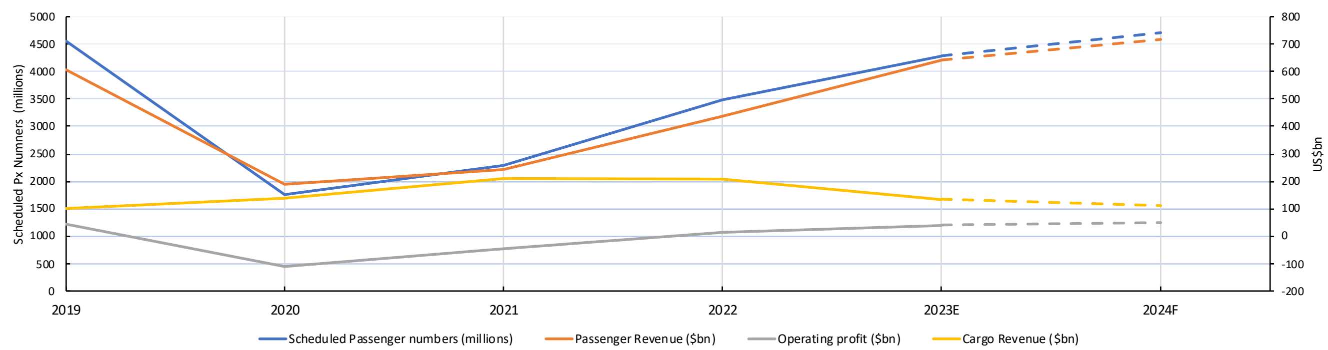
"We have changed the whole core economics. It used to be that our front cabins were our loss leaders. Now our front cabins are our profit centres [which is] a huge paradigm shift. People underappreciate the transition that the industry has gone through in distributing those premium products after years of just racing to the bottom on the commoditisation. And we're still not done with that."

Ed Bastion



Source: International Monetary Fund, World Economic Outlook Database, October 2023 | IATA Global Outlook for Air Transport - December 2023

FIG. 3: WORLD ECONOMIC GROWTH (GDP), AIR PASSENGER TRAFFIC (RPKS) AND AIRLINE PROFIT ($BN)



Source: IATA Industry Statistics, December 2023

FIG. 4: TOTAL MARKET GROWTH

still predicting a return to profitability in 2024 – is still somewhat cautious in predictions for the coming year. This is due to the mixed performance of some regions, notably the slow recovery of Asia, specifically China, but also with an eye to the increased geopolitical tension throughout the world with wars in Europe and the Middle East. IATA forecasts airline net profit to reach $25.7bn in 2024 (industry net profit in 2019 was $26.4bn) with a 2.7% net profit margin (3.1% in 2019), but also expects growth in terms of RPKs to reach more stable levels, predicting RPK year-on-year growth of 9.8% for this year.

The latest air travel data from IATA shows that passenger travel for November 2023 globally has reached 99.1% of November 2019 levels. November 2023 international RPKs reached 94.5% of November 2019 levels, while domestic traffic was 6.7% above the November 2019 level. Although international global travel remains 5.5% below pre-pandemic levels, IATA director general Willie Walsh said that the gap is "rapidly closing", adding that current "economic headwinds are not deterring people from taking to the skies". IATA also noted that long-term airline profitability shows that while the industry is exposed to external shocks, it typically returns to profitability "relatively quickly".

Robert Morris, global head of consultancy at Cirium Ascend Consultancy, commented that airlines had one of their best years in 2023. "When you bear in mind that this is the start of the next growth cycle, it is surprising when you look at their finances."

Morris noted that Cirium was expecting the airline industry to exceed IATA's operating profit forecast for 2024, which he commented was "remarkable considering where the industry has come from in a relativity short period post-pandemic".

Many airlines around the world remain burdened by debt raised during the pandemic and industry experts have been predicting a secondary wave of restructuring or even bankruptcies considering the relatively low number of casualties following the pandemic but that hasn't happened – at least not yet – owing primarily to the growth in demand, constrained aircraft supply, and with inflation pushing up fares. Many of the larger airlines have worked hard to reduce their debt stacks and smooth out their debt maturities to provide comfort to investors and shareholders that they are on a more stable track. Smaller airlines may be struggling with the heightened cost environment but lessors report that most customers are back to paying their lease rentals on time.

The world recovery has been inconsistent. Much was discussed in last year's report about the lag in recovery in South East Asia and China but there are now more positive signs of an upturn in those areas despite ongoing macroeconomic and geopolitical challenges. IATA data for November 2023 shows that China domestic travel was particularly strong, rising 272% as it recovered from Covid restrictions that were still in place a year ago. All of the numbers are positive for growth in air travel, especially in Asia-Pacific but headwinds are building and that has some being more cautious in their forecasts for the coming 12 months.

"All of the indicators are signalling concern – GDP growth projections or composite leading indicators – but I was signalling concern 12 months ago," says Morris. "There was certainly concern 24 months ago when we were all worried about recessions in developed economies. We've seen slow growth, but we have seen growth. We haven't seen any recessions yet. Predictions are for growth globally to be between 2-3% in 2023 and slightly slower in 2024 but still growth. In the context of those macroeconomics, that's a positive."

ECONOMIC HEADWINDS AND GEOPOLITICAL SHOCKS

Airlines are carrying a higher debt burden and although they are all now generating revenue, those airlines that did not receive government support may struggle to service those debts in the coming years. "Airlines have rebounded but they are carrying a lot of debt on their balance sheets or are in arrears with lessors and other suppliers that they will need to find a way to refinance or restructure their balance sheets," says Robert Korn, president and co-founder of Carlyle Aviation Partners. "Those airlines are generating cash today but certainly not enough from an operating standpoint to repay those amounts over the next two or three years."

With balance sheets under pressure, rising costs are hitting profit margins and capacity restrictions are impacting airlines' ability to expand and increase revenue.

"The headwinds are more normal in the sense that increased interest rates and the strength of the US dollar have made it more challenging," observes James Meyler, chief executive officer of ORIX Aviation. "While the recovery has been very good, margins are still tender – the industry average is about $3 per passenger in terms of profit levels across the industry so it doesn't take a big increase in costs to eat into that profit margin. Cost control is going to be the big challenge."

Higher labour costs remain a pressing issue for airlines due to the continued lack of staff, coupled with union demands and renegotiated salaries across pilots and cabin crew, and there has been a significant increase in labour costs throughout the industry that has now been embedded. Maintenance costs have also been increasing due to the similar staffing dynamics at MRO shops, as well as a shortage of slots driving up demand, and scarcity of parts driving up turnaround times for maintenance visits. Fuel costs are outside airlines' control for the most part and they have been riding waves of spikes due to the continued war in Ukraine and now in Gaza, which threatens to destabilise the Middle East and major oil producing regions.

Interest rates have risen rapidly but now appear to be stabilising at a new level around 4-5% in the US and Europe, while inflation has risen dramatically over the past year but again is showing signs of becoming more stable and even beginning to fall (see Fig.11: Inflation and Central Bank Interest Rates 2021-2023, Chapter Two, p23, where there is also a more in-depth look at the impact of interest rates on the sector.)

Higher inflation and interest rates have also been driving up lease rates, which is aiding lessors while putting additional pressure on airline costs.

Aircraft supply and manufacturing issues have become even more significant over the past year despite deliveries increasing from the original

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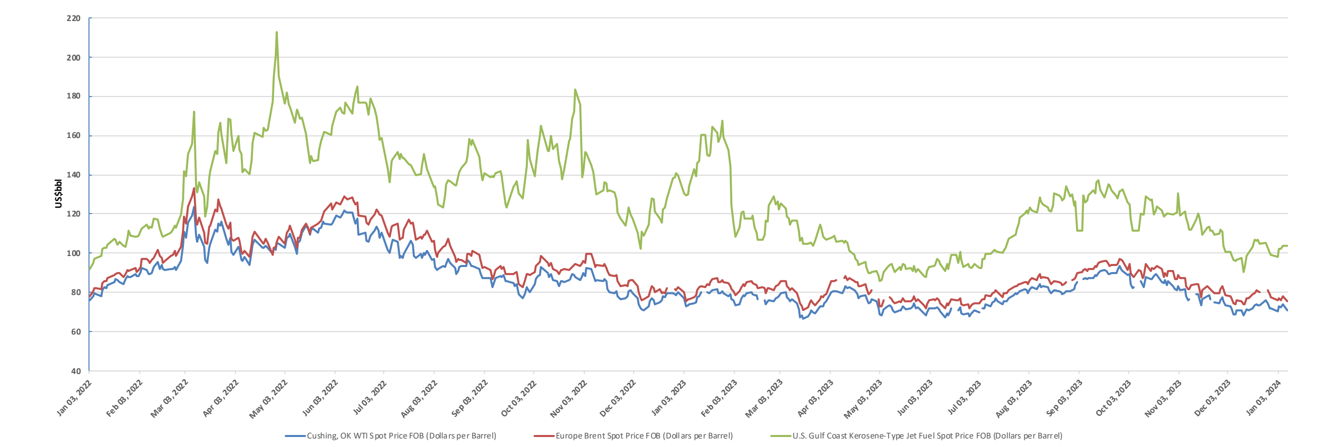

Source: International Energy Agency (IEA)

FIG. 5: OIL / JET FUEL PRICES 2023

equipment manufacturers (OEMs). Adding to the general difficulty in restarting production lines following the pandemic shutdown with a lack of staff and supply chain challenges impeded production rates, manufacturing issues also came to light last year and into 2024 with issues relating to both airframes and engines.

Many of the major manufacturing issues were centred on the Boeing 737 MAX aircraft type. In August 2023, Boeing disclosed a manufacturing defect in its 737 MAX aft pressure caused by incorrectly drilled holes by supplier Spirit AeroSystems, which required inspections of inventory aircraft. At the end of the year, the Federal Aviation Administration (FAA) disclosed it was closely monitoring possible loose bolts in the 737 MAX rudder control system. On January 6, 2024, a door plug on a 737 MAX 9 became detached onboard an inflight Alaska Airlines leading to the rapid decompression of the cabin and an emergency landing. There were no fatalities and the aircraft landed safely. However, the incident triggered an emergency airworthiness directive (EAD) from the FAA for all of the aircraft types to be grounded and inspected. Some 171 aircraft were grounded. Following inspections both Alaska Airlines and United Airlines reported issues related to the door plug installation such as loose bolts, while the US National Transportation Safety Board (NTSB) is continuing with its investigation. Although there are no definitive answers yet as to why the incident occurred, it is the latest in a series of setbacks for the Boeing MAX aircraft, which will only delay production further.

On the engine side, manufacturing issues with the Pratt & Whitney (P&W) Geared Turbofan Engines (GTF) PW1100 powerplants had been causing aircraft on ground (AOG) issues for some time but the real scale of the problem emerged in September 2023 when P&W parent RTX confirmed that 600 to 700 incremental geared turbofan engines would have to be removed from aircraft for quality checks between 2023 through to 2026 at a cost to the company of $3bn. (More detail on the manufacturing and supply chain issues are examined in Chapter Four, OEM and Fleet Challenges.)

Given the various supply chain issues and the fact that aircraft are taking longer to get out of maintenance than they have historically, the constraints on capacity are expected to continue into 2025, with some predicting 2026 before the production lines are back to full force and delivery streams have recovered.

"The supply chain and orderbook delivery stream is broken," says Meyler. "Any hope of having a fix coming in soon has been thrown out of the window with various new challenges like the GTF engine issues, the continued certification delays and issues with the Boeing product." Meyler expects it to be more like three to as many as five years before the manufacturers return to a more normal delivery schedule.

Cirium's Morris notes that there are a thousand-plus suppliers in the aviation manufacturing supply chain, which each had their individual issues having been damaged by the pandemic. "Based on our projections from 2018, there are 3,000 single aisle aircraft that were never made," says Morris, noting he believes that the structural deficit of aircraft will continue through 2027.

That dearth of new equipment has restricted aircraft availability for airlines, which have turned to lessors in the search for lift to serve the rapid increase in demand. This supply-demand imbalance has pushed up lease rates and asset values, increasing airline costs further.

The geopolitical environment has also worsened over the past 12 months. The Russian-Ukraine war has continued with no real conclusion in sight and the terrorist atrocities carried out by the Hamas militia in Israel on October 7, 2023 prompted a hot war in Gaza that threatens to destabilise the entire Middle East region.

John Plueger, chief executive officer at Air Lease Corporation, comments that current geopolitical issues are foremost in board discussions. "We are watching the current geopolitical situation very closely," he says. "We were hurt a little in Russia but there was no way of predicting its invasion of Ukraine and certainly no one could have predicted the Hamas attacks in Israel. These are the realties we deal with."

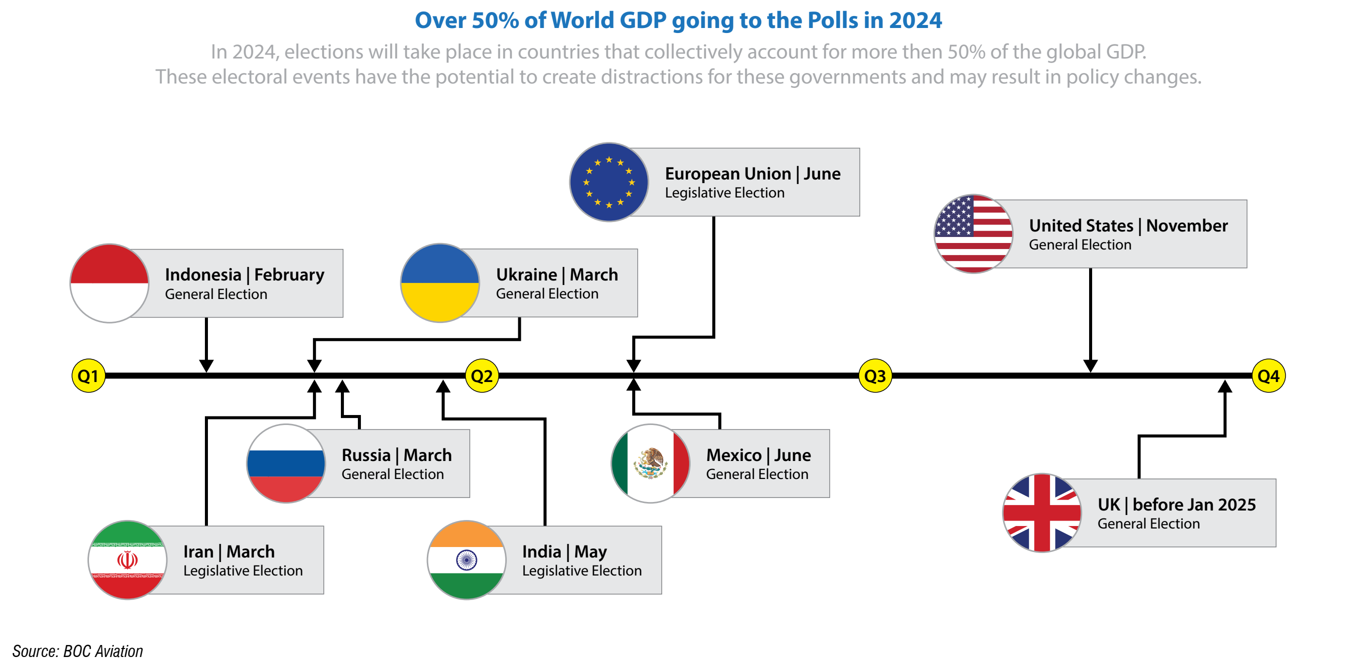

FIG. 6: 2024: THE YEAR OF ELECTIONS

Geopolitical issues are omnipresent and part of the normal operational environment for the world's airlines. "Every few years we run into geopolitical issues and we tend to get through them," says Aengus Kelly, chief executive officer of AerCap. "We are a global industry. Every year, excluding Covid, more people will travel than the last. That has continued since the dawn of aviation. That structural trend is definitely there."

Lessors were adversely impacted by Russia's invasion of Ukraine since their aircraft on lease to Russia airlines were trapped in the country, with insurers refusing to pay out. In the past year however, many lessors, including Air Lease Corporation and AerCap, have begun to recoup some of those losses with insurance payments.

Geopolitical uncertainty is particularly high this year since aside from the two wars, 2024 is being tagged as the Year of Elections. There are significant elections being held in Indonesia, Russia, India, Mexico, the EU, the US and the UK, which Avolon chief executive Andy Cronin is concerned may lead to a shift in economic policy that could impact aviation. "We have to be aware of the potential for escalating trade conflict," he says. "We have seen a growing anti-globalisation among some of the major world economies. When you layer onto that some significant upcoming elections, with an electorate that is moving away from the centre, there could be some potentially big shifts in economic policy."

IATA's January 2024 key risks report also noted the importance of the upcoming elections since the results could lead to an impediment in trade and increased oil-price volatility.

Geopolitical issues are the main driver of fuel price volatility. In third quarter earning calls many airlines noted jet fuel prices as a major headwind to profitability but in the fourth quarter that tailed off slightly. The crack spread between the price of crude oil and jet fuel has also remained stubbornly high.

These headwinds and perceived risks have impacted investor perception of airline value, with share prices lower across the board. "Airlines are doing really well but their stock prices are performing poorly," says TD Cowen's Helane Becker. "They are below March 2020 lows, which I find amazing considering how well the airlines have recovered."

The supply-demand imbalance for aircraft limits earnings growth for airlines but in the interim it has

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>
> *Aengus Kelly*
> *Chief Executive Officer of AerCap*

enabled them to raise fares leading to healthy yields over the 2023 summer period. That said, capacity constraints will begin to impact income growth as availability of aircraft becomes even more scarce and more costly.

JP Morgan's Mark Streeter explains why the current market dynamic has made him bullish on aircraft rather than on airlines. "On a global basis, domestic travel has returned to 2019 levels but global GDP relative to 2019 is still way ahead by at least 10 or 15% - airline traffic should be a multiple of that so we have not recovered yet to the pre-Covid traffic trend," he says. "When we talk to investors we explain that we are more bullish on the aircraft side than the airlines, which is a function of that long-term pull to trend on traffic and the supply-demand imbalance for aircraft."

Streeter argues that air traffic should have recovered to levels beyond 2019 by now based on its relationship to GDP but it has been restricted by the lack of aircraft. "We haven't had the aircraft availability to stimulate lower fares and more traffic because those brakes have been put on the market by the Boeing and Airbus supply chain issues and the GTF engine problems."

AerCap's Kelly agrees that investors are concerned about airlines' rising cost base and the weakening macroeconomic picture despite record profits being recorded by many large airlines. "There is concern from investors about the stability of demand at these elevated yield levels," he says, "because of the cost of living and rising interest rates, which means that the consumer has less disposable income."

A good demonstration of this negative investor perception can be seen in equity investors' reaction to Delta Air Lines recent record full year 2023 results. Delta delivered earnings per share (EPS) of $6.25 and a pre-tax income of $5.2bn, which was almost double the 2022 result, however the company lowered its EPS guidance for the first quarter of 2024 to $6.00 to $7.00. While the mid-point of that range was right at the consensus estimate of $6.50, the outlook was below Delta's (DAL) long-term profit target for several years of more than $7.00 EPS. The Delta team said on the January 12 earnings call that they were cautious on future guidance due to rising costs, with fuel and maintenance costs predicted to be up in 2024, added to the disruption caused by supply chain issues and a "testy" geopolitical environment. Delta's stock opened more than 7% lower following its results announcement, despite Delta's forecast for free cash flow of between $3bn to $4bn.

"On a global basis, domestic travel has returned to 2019 levels but global GDP relative to 2019 is still way ahead by at least 10 or 15% - airline traffic should be a multiple of that so we have not recovered yet to the pre-Covid traffic trend. When we talk to investors we explain that we are more bullish on the aircraft side than the airlines, which is a function of that long-term pull to trend on traffic and the supply-demand imbalance for aircraft."

Mark Streeter of JPMorgan

Regional Review

NORTH AMERICAN STRENGTH

The North American market has been the major driver of traffic growth and profitability for the global industry over the last year, which is expected to continue into 2024 despite some softening of domestic demand seen in the latter half of 2023. The region accounts for 56% of IATA's total industry profit forecast for 2024 amounting to $14.4bn – about the same as the $14.3bn estimated for full year 2023.

The region was the first to emerge from the crisis and was back to profitability in 2022 much earlier than other jurisdictions and in summer 2023 demand also returned for transatlantic travel.

"Airlines have done really well, especially in North America," says TD Cowen's Becker. "Over the past three years, we have seen a predictable recovery… locally, domestically, regionally and now internationally. This summer [2023] we saw very strong demand on the North Atlantic routes as people looked to recreate experiences they had pre-pandemic or just that pent-up demand for not have been able to travel for so long." Becker characterises 2021 and 2022 as years where domestic markets recovered, specifically in North America and European markets, with Asia-Pacific being slower to recover. International traffic recovered throughout 2022 and into 2023, and she regards 2023 and 2024 as the year of transatlantic recovery. "2025 is probably the first year where we get a normalised, balanced travel year," she says.

Low-cost carriers (LCCs) benefitted from that early return of domestic travel, especially in the North American market, but over the past year a new phenomenon has emerged where travellers appear to be willing to spend more to travel further afield and for better service, which has translated to increased traffic and yield for the legacy carriers.

"What we're seeing is almost a tale of two cities," says Greg Lee, Global Head of Transportation Banking at Goldman Sachs. "Some of the larger airlines with significant international operations, premium business, long haul services, have been performing better than airlines with more of a domestic and low-cost carrier model. In the most recent series of earnings calls, we have seen a divergence between premium and the front of the cabin and the lower cost side of the cabin."

"We are seeing something different happening than we would have seen previously," agrees Betsy Snyder, S&P Global Ratings. "Typically low-cost airlines have done well due to their lower cost base and they did do well in the beginning when short-haul traffic started to come back after the pandemic. But in 2023 we have seen a change with the pent-up demand for international travel. The big three airlines – United, Delta and American – all have global operations and have been the beneficiaries in terms of demand. Whereas the other airlines that focus on domestic travel have seen demand reduce… they also have exposure to higher fuel prices and labour costs have been increasing and there is a shortage of pilots that have been leaving smaller airlines for the larger carriers. They have been adding more capacity than some of the larger airlines so their earnings have been under pressure. Earnings for smaller airlines like Spirit and JetBlue have been subpar relative to the big three network carriers."

The flip in fortunes for the LCCs with the legacy carriers is due to a number of factors, primarily cost convergence. LCCs historically had a lower cost base than legacy carriers but following the pandemic, there has been an increase in labour costs across the board, as well as pilot shortages bumping up their salaries which has led to operating costs of LCCs and legacy carriers converging eliminating that traditional "low-cost" advantage. Aengus Kelly also notes that the fixed cost base for airlines has been increasing rapidly, particularly noting that the industry now has the first "million-dollar pilots", with captains of widebody aircraft earning base pay of over $400 an hour in addition to pensions and healthcare benefits. Rising fuel costs are an ever-present issue for all airlines but the collective increase in labour costs has severely challenged many carriers and continues to be a concern, with most agreements having been resolved recently with substantial increases.

The macroeconomic environment has also contributed to this reversal in fortunes for the US LCCs, since as Betsy Snyder suggests, they have a different customer base than legacy carriers whose "disposable income is not growing as fast as other segments of the economy", which she says has been hurting LCC demand.

In the airline's third quarter earnings call on October 31, 2023, Joanna Geraghty, JetBlue president and chief operating officer (now announced as the next CEO to take over on February 12, 2024), noted that the airline had suffered from a "softer than expected off peak and close in leisure demand in September" although she called the airline's premium Mint offering a "bright spot" in the third quarter results with year-on-year revenue improving by 4.5%. "We continue to see strength in Mint, even with our Mint capacity up 19% year-over-year", said Geraghty. JetBlue was able to benefit from its transatlantic services using its A321LR aircraft to London and Amsterdam, expanding to Dublin and Edinburgh.

Spirit Airlines also reported a loss for the third quarter of 2023 amid "softer demand" for its services. Chief executive Ted Christie commented that the airline had not seen the "anticipated return to a normal demand and pricing environment for peak holiday periods". The airline also referred to challenges caused by higher fuel prices and Neo engine availability issues leading to a lower than expected margin for the fourth quarter.

Frontier and Allegiant echoed their LCC competitors reporting softening of demand for the fourth quarter and increasing operating challenges including elevated fuel and labour costs, as the financial impact from adverse weather and capacity constraints. But the low margin airlines are not flying empty – load factors remain healthy but the differential for lower cost carriers has always been a focus on high aircraft utilisation, which has been hampered by adverse weather earlier in the year, airport/ATC delays and capacity constraints as aircraft are grounded due to engine issues. The key for low margin airlines going forward into a more difficult operating environment will be balancing load factors with price.

The picture is different for US legacy carriers that have all reported increased demand for premium products as well as their basic offerings as travellers who can afford to pivot to more premium services. United Airlines, Delta and American Airlines have all posted strong third quarter 2023 numbers and yields for their premium products and are also benefitting from a return of business travellers.

In its third quarter earnings, United Airlines chief executive officer Scott Kirby said that passenger numbers were up, from its basic economy product all the way to more premium products, including first class, on both its domestic and international routes, serving both business travellers and increasingly leisure customers.

The continued success of airlines to attract leisure flyers to premium products has endured past the point where many had expected so-called "revenge travel" to have petered.

Delta's Bastian believes there is enduring demand for premium air travel; he says that the post pandemic premium cabin passenger is the same person but who is travelling for different reasons. He commented that people who had travelled in premium for business reasons pre-pandemic were continuing to do so for leisure reasons now and that the airline had seen "incredible stickiness" for its premium products. For this reason, Bastian notes, that Delta is trying to keep premium travel affordable so people can use it for business and leisure travel.

Delta has rolled out a premium economy product on long-haul international routes, which Bastian described the revenue generation as "above our expectations". Delta is also seeing an increase in corporate sales, which accelerated by the end of the year, including double-digit year-over-year growth in December. The US carrier said that technology and financial services business were driving momentum for business travel. "We are finally starting to see tech companies traveling again," said Bastian. "The return to office that is driving some of growth."

The large US carriers have had the biggest recovery in both specialty and profitability and have been able to fill the front of their aircraft with premium leisure passengers. ORIX Aviation's Meyler observes that this trend has continued "very resiliently throughout 2023". He noted though that there is an East-West divide on this current trend toward premium travel with Asian carriers not observing a growth in premium traffic potentially as a consequence of the lag in the recovery in Asia, which he adds is now beginning to change.

The change in fortunes for the traditional LCCs has led to a new moniker for the group – namely low margin airlines (LMAs) – although Allegiant has revised this for its business model to Profitable Leisure Focus Carrier or PLFC, according to chief Barry Biffle in the airline's November earnings call.

"What we're seeing is almost a tale of two cities. Some of the larger airlines with significant international operations, premium business, long haul services, have been performing better than airlines with more of a domestic and low-cost carrier model. In the most recent series of earnings calls, we have seen a divergence between premium and the front of the cabin and the lower cost side of the cabin."

Greg Lee
Global Head of Transportation Banking of Goldman Sachs

North American airlines have been seeking mergers to strengthen their offerings. The JetBlue-Spirit merger however has been stymied by the ruling of US District Judge William G. Young on January 16, 2024 that the merger – first announced in July 2022 – would substantially damage competition.

Alaska Airlines announced its intention to merge with Hawaiian Airlines on December 3, to resounding support from the industry but with the usual concerns over the reaction of regulators. TD Cowen's Becker, said at the time of the announcement that she expects the regulators to approve this deal noting that the combination "makes a lot of sense, and it should be approved". JP Morgan's Streeter also said at the time that due to Hawaiian's relatively small size and the fact that after the merger Alaska would only by a quarter the size of the big three, he did not expect any regulatory issues.

EUROPEAN CONSOLIDATION

European airlines have recovered well following the pandemic with airlines already back to profit. IATA is predicting European airlines will post a record net profit of $7.7bn for the full year 2023, with the positive trajectory expected to continue into 2024 with $7.9bn 2024 net profit forecast. Passenger revenue growth is expected to slow in 2024 to 10% from 22% last year but from a high base in 2022 of 102%, which shows growth rates are normalising for the region.

All airlines, including legacy carriers are riding high on the back of sustained demand for air travel, especially for premium services.

Lufthansa Group posted a very strong third quarter profit thanks to a "record summer" helping the group achieve €10.3bn in revenue with an operating profit of €1.5bn, making it the second best third quarter result in its history. Net income was €1.2bn. Lufthansa stated that at 25% above the 2019 third-quarter level, third quarter yields reached a new record high with demand for leisure travel remaining strong "particularly in the premium segment". The German airline group indicated in November that the very good summer demand had extended into October, with strong demand during the Christmas season on both short-haul and long-haul flights remains high, especially among leisure travellers. The company said that the trend toward more bookings in premium classes, meaning business class or first class, was continuing although chief executive Carsten Spohr noted on an earnings call in November 2023 that business travel was not yet back to full force but that premium cabins were more often being filled by private, i.e. leisure, travellers. Lufthansa has increased its premium cabin offerings on board its A350, 777-9 and 787-9 aircraft with its new long-haul product, Lufthansa Allegris, investing a total of €2.5bn by 2050 – demonstrating the company's conviction that demand for premium services from leisure travellers is set to continue.

Air France-KLM recorded a 9% increase in third quarter operating result to €1.3bn over the prior year quarter with passenger numbers up by nearly 8% year-on-year. The airline group credited the success to an increase in load factor on the long-haul, short and medium-haul routes and Transavia, as well as an increase in yield on the North Atlantic, Africa, Caribbean and Indian Ocean and short and medium-haul services. Air France is also continuing with a "premiunisation" journey to upgrade its premium classes with new cabins.

IAG – parent company of British Airways, Aer Lingus, Vueling, Iberia and Level – reported a healthy profit of €2.15bn for the nine months of 2023 on revenues of €22.3bn. The group has reported "very strong leisure demand across all our airlines". British Airways has also invested in its premium cabins, with an average of 56 business class seats per aircraft, but with a reduced first class cabin from 14 seats to approximately eight. Nicholas Cadbury, CFO at IAG, said that the company expects premium capacity to rise above 2019 levels by about 2025 and that the premium leisure market was strong. In its third quarter results, Aer Lingus reported particularly strong premium

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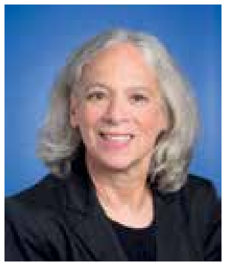


leisure on its transatlantic network, which drove "record load factors in business cabins". IAG is continuing to invest in lower fare brands and at its capital markets day in November 2023 announced that it was applying for an independent airline operating certificate for long-haul, low-cost brand Level to operate enhanced services out of Barcelona.

Although the legacy carriers have been enjoying a period of profitability thanks to higher fares and great demand, European low cost carriers have also been profitable.

Ryanair reported strong first half financial year results in November 2023, with profits up to €2.18bn on the back of a "very strong Easter" and "record summer traffic" with a steady average load factor of 95%. Chief executive officer Michael O'Leary noted that the airline was operating in a "constrained market" that was "good for traffic, good for load factors, and good for average fares". Ryanair's costs have been rising however, with fuel up 29% for the first half of its financial year that the airline manages with a thorough hedging programme. O'Leary expressed his frustration at the continued disruption with Boeing delivery delays but said the airline was confident it would receive 45 of the 50 aircraft due for delivery by end of June in time for the summer peak in 2024, which he says are "critical to traffic growth" for this year.

However, it is clear that some airlines have been struggling to recover following the pandemic, which has stimulated airline consolidation in Europe. At the end of May 2023, Lufthansa announced an agreement to acquire a 41% stake in Italy's ITA Airways for €325 million, which was agreed with the Italian Ministry of Economy and Finance in June including options to take a greater share at a later date. At the end of November, Lufthansa sought antitrust approval from the European Union (EU) with a decision expected by mid-January.

In October 2023, Air France-KLM acquired a 20% stake in SAS Scandinavian Airlines with a consortium involving the Danish government and Castlelake. Air France-KLM has the option to become a controlling stakeholder after two years. Benjamin Smith, Air France-KLM chief executive, said at the time the deal was announced: "With its well-established position and Scandinavia and strong brands, SAS offers tremendous potential."

IAG confirmed in November 2023 that it anticipates completing its purchase of Air Europe by the end of 2024. The acquisition is currently being reviewed by the European Commission. TAP Air Portugal is also up for sale.

This move toward consolidation has led industry observers to predict that the European market may be moving towards a similar situation seen in North America, which is dominated by three large airline groups – potentially IAG, Air France-KLM and Lufthansa – with low fare market being dominated by the market leader, Ryanair. The manufacturing issues with aircraft and the GTF engine though will continue to curtail capacity growth, elongating the timeframe for that consolidation prediction to play out.

MIDDLE EAST & AFRICA

Middle East airlines have recovered in step with the rise in demand for long-haul air travel, which has also assisted with the recovering in demand for widebody aircraft. Airlines in the region are reporting a return to profits and are back to ordering aircraft. With the push for economic transformation of the Kingdom of Saudi Arabia realised via Vision 2030 - the ambitious program to drive national economic transformation and achieve positive and sustainable change in the country – the growth in the region is beginning to ramp up. The mission has been entrusted to the Saudi sovereign wealth fund, Public Investment Fund (PIF), which is promoting the launch of Riyadh Air as well as backing the new aircraft lessor AviLease that has captured market share quickly with the acquisition of Standard Chartered leading business.

Africa retains its historic challenges with passenger travel, with the main flag carriers still struggling to recover.

"Europe is consolidating real time. It is a real land grab; extremely competitive"

Joe McConnell
Deputy Co-Chief Investment Officer of Castlelake

SOUTH AMERICA

Latin America has recovered well from the pandemic slowdown, indeed Mexico was one of the first countries to recover their domestic traffic. Carriers continue to face challenges, however. In Brazil, GOL is currently working to renegotiate its lease agreements, for now outside of a bankruptcy filing, but Azul has emerged stronger from its broad recapitalisation program, which included an unsecured dollar notes exchange agreement as well as the $800 million new issuance of new money notes secured by its loyalty program, brand IP and tourism operator. LATAM also continues to benefit from its restructuring and now has a positive trajectory.

ASIA-PACIFIC RESURGENCE

The Asia-Pacific region has experienced the strongest growth in airline revenue in 2023, with growth accounting for half of the 47% global increase to $642bn. IATA figures show passenger traffic (measured in RPKs) is up by 98% over last year, on the back of a 78% rise in capacity. Profitability is also returning to the region.

Avolon's Cronin says that the post-Covid recovery that started about a year and a half later than in North America, is continuing to spread through Thailand, Malaysia, Indonesia and some of the bigger economies in the Asia-Pacific region although the Chinese picture he says is a little more mixed. "We have seen domestic capacity surpass pre-Covid levels for some time now," says Cronin, "but the long-haul build-up has been slower than anticipated. That is rapidly catching up now, with that pent-up demand still feeding through in Asia."

SMBC Aviation Capital's Peter Barrett sees "good momentum in Asia" with airlines showing increased demand, increases in capacity and he notes that "cash collections are very strong" adding that the only lag remaining in the region was perhaps cross border business out of domestic China but he expects that to recover in step the Chinese economy.

In early December, ORIX Aviation's Meyler was more cautious on the Chinese recovery, specifically relating to airline profitability: "From a profitability level, 2023 has been very poor really across the Chinese market – loss making in fact," he says. "While most kind of banking institutions will forecast a return to profitability of China in 2024, we're not really seeing it play out yet."

Although the market is still waiting for a big reopening of international traffic from China, domestic traffic patterns in China have been robust. International carriers are all reopening routes to Chinese mainland, preparing for a spike in demand for long-haul trips.

United chief commercial officer Andrew Nocella noted that demand for Atlantic and Pacific travel for the third quarter of 2023 was "truly outstanding" which United forecasts continuing into the fourth quarter. He added that United had taken advantage of the resurgence in demand across the Pacific by adding capacity to key markets including resuming daily flights to Beijing and Shanghai from San Francisco and adding routes to Manila.

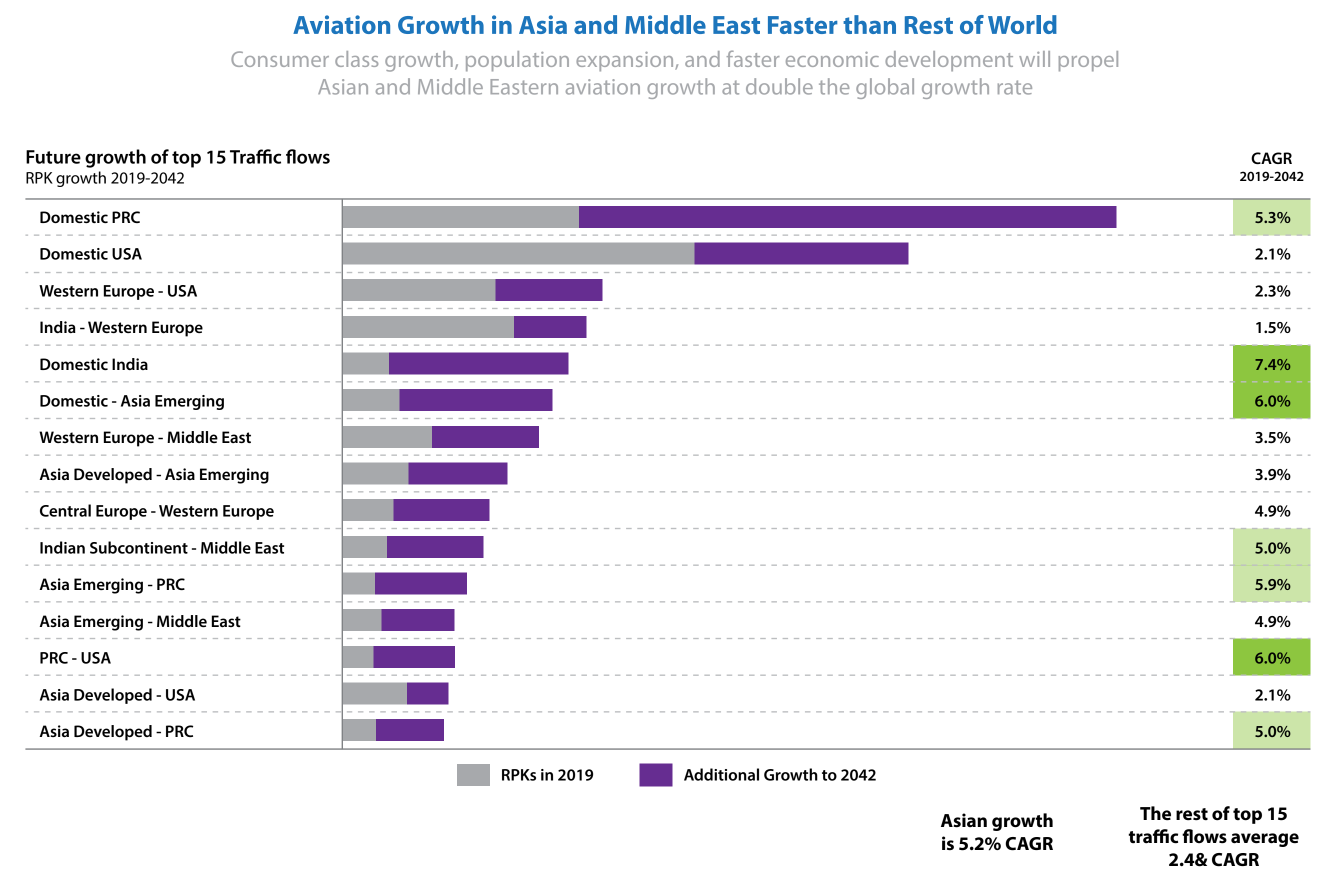
India is again being forecast for substantial growth in air travel. India has lagged behind other parts of the world for some time in terms of the development of the aviation sector. That is changing, and changing rapidly. "In India, you have to appreciate the growth of the population, the growth and maturity of the middle class, and the number of new airports under construction," says Carlyle Aviation's Korn. He sees growth in India coming from the low-cost carriers as well as large airlines with access to capital placing large aircraft orders.

A little over a year following its takeover from the Indian Government by the Tata Group, Air India placed an historic order for 570 aircraft Boeing and Airbus aircraft (140 A320neos, 70 A321neo, 34 A350-1000, six A350-900s, 190 737 MAXs, 20 787s and 10 777Xs). Not to be outdone, rival Indigo announced an order for 500 A320 Family aircraft at the Paris Air Show.

India is also revitalising its aviation finance offerings, with the closing of the first finance leases through Gujarat International Finance Tec-City, popularly known as GIFT City. Air India financed six A350-900s via GIFT City by the end of 2023. *(For more details, see Chapter Two, Avation Finance).*

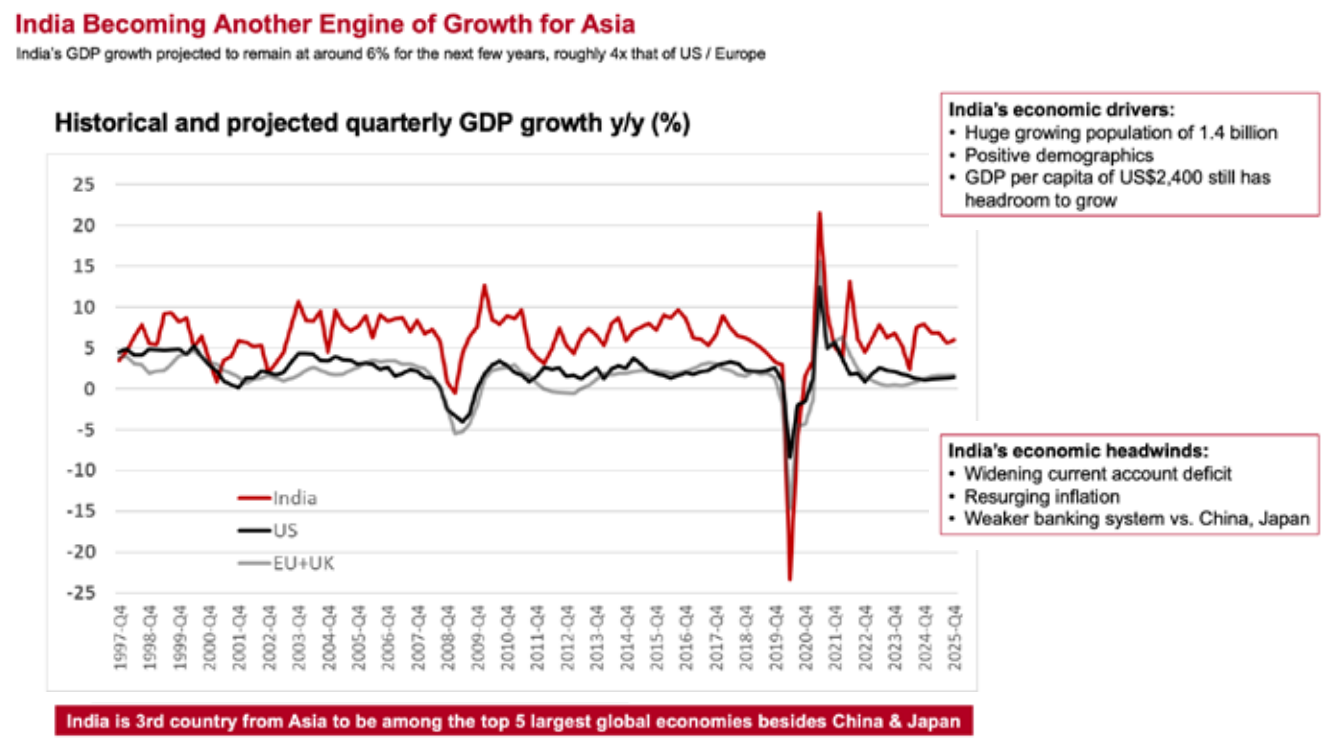
"We have seen domestic capacity surpass pre-Covid levels for some time now but the long-haul build-up has been slower than anticipated. That is rapidly catching up now, with that pent-up demand still feeding through in Asia."

Andy Cronin
Chief Executive Officer of Avolon



Source: BOC Aviation, Nov. 2023

FIG. 7: AVIATION GROWTH IN ASIA & MIDDLE EAST



Source: BOC Aviation, Nov. 2023

FIG. 8: INDIA GDP GROWTH

Fallout from GoFirst insolvency

India has not been all about growth in 2023. It also saw the demise of Go First. The Indian carrier cancelled all of its flights in May and filed an insolvency plea before the National Company Law Tribunal (NCLT), reportedly with debts of nearly $798 million.

GoFirst blamed the situation on Pratt & Whitney for its non-supply of engines.

"GoFirst has had to take this step due to the ever-increasing number of failing engines supplied by Pratt & Whitney's International Aero Engines, LLC, which has resulted in GoFirst having to ground 25 aircraft, equivalent to approximately 50% of its Airbus A320neo aircraft fleet as of 1 May 2023," the airline said in a press release.

"The percentage of grounded aircraft due to Pratt & Whitney's faulty engines has grown from 7% in December 2019 to 31% in December 2020 to 50% in December 2022. This is despite Pratt & Whitney making several ongoing assurances over the years, which it has repeatedly failed to meet," GoFirst added.

The airline has been facing problems with the unavailability of aircraft for many quarters. All of its A320neo aircraft are powered by Pratt & Whitney engines. Air India and Vistara, the other two A320neo family operators in India, are powered by CFM engines. IndiGo opted for CFM as part of its follow-on order, while GoFirst selected Pratt & Whitney for its second round of orders too.

Responding to Go First's accusations against Pratt & Whitney, the engine manufacturer said that GoFirst had a "long history" of missing payments.

Previously, GoFirst had been found to default on payments to operational creditors including $146 million to vendors and $318 million to aircraft lessors.

Lessors have been struggling to repossess aircraft from GoFirst. However, On October 3, 2023, the Indian Ministry of Corporate Affairs issued a notification to amend Section 14(3)(a) of the Insolvency and Bankruptcy Code 2016 (IBC 2016) stating that the provisions shall not apply to transactions under the Cape Town Convention relating to aircraft, aircraft engines, airframes and helicopters.

The announcement was greeted favourably by the aircraft leasing community as it provided more clarity that the Cape Town Convention would take precedence in future insolvency hearings involving aircraft assets. The Aviation Working Group (AWG) issued a positive notice in response to the ruling. However, the AWG subsequently issued a negative ruling on India's compliance with Cape Town since the lessors in the GoFirst case remain waiting for a ruling to initiate a corporate insolvency resolution having already terminated aircraft leases and filed deregistration applications with the DGCA.

Although the National Company Law Appellate Tribunal (NCLT) upheld the admission of GoFirst's application and the imposition of the moratorium (intended to allow swift repossession of the aircraft), it 'left to the NCLT the question of whether the leased aircraft.... fell within the scope of the moratorium'.

Although changes to the Indian Insolvency and Bankruptcy Code were intended to make it easier for lessors to repossess their aircraft in the event of an insolvency (placing the country's legislation in line with the Cape Town Convention), without specific underlying core legislation having been passed by Parliament, concerns remain as to whether these will be applied prospectively or retroactively.

The AWG notes that 'beginning on 18 May 2023, certain lessors brought writ petitions seeking orders by the High Court compelling the DGGA to register and export aircraft in accordance with the terms of Indian law', but confusion remains. At the time of the Aviation Working Group's Watchlist Notice Update No.2, 'CTC remedies have not been made available to lessors nor have lessors been able to access aircraft to determine that their aircraft are being maintained in accordance with the leases,' highlighted the Aviation Working Group in a recent statement. Indeed, the time period (210 days and counting) since the commencement of GoFirst insolvency proceedings is more than double the period in which remedies should be available, adds the statement.

The nature of the Indian court system is also allegedly further compounding these problems, with difficulties in scheduling dates and further delays adding to lessors' misery. However, despite regular communication channels with both government and bankruptcy administrators, the requirement for primary legislation (underpinning the Cape Town principles) remains crucial. The ongoing ambiguity surrounding the Section 14 moratorium – in particular, delays imposed in resolving legislation seen by many lessors as essential – could also do profound damage in a market already experiencing exponential growth.

Citing the over-double waiting period having already passed, 'failure to make remedies available to creditors is non-compliant with the Cape Convention,' notes the AWG, adding that 'material non-compliance is compounded by significant delays in court hearings while the aircraft remain in possession of the debtor and insolvency administrator'. With no 'express recognition' of the timetables and 'no near-term end to the litigation,' India's outlook for CTC compliance has been downgraded to 'negative'.

Airline bankruptcies and restructurings have continued over the past year as smaller airlines have struggled to resume profitable operations following the crisis with little government support or access to affordable capital. The most prominent of 2023 bankruptcies has been the GoFirst case in India, still working its way through the courts, which the airline blames squarely on the grounding of its aircraft due to the GTF issue (see sidebar for more detail).

When the scale of the GTF issue was revealed, some experts were predicting more airlines could follow suit but since that time as Pratt & Whitney has put in place its fleet management plan and worked to compensate affected companies, there is more of a sense that the issue will be resolved with too many airline casualties.

> **"From a profitability level, 2023 has been very poor really across the Chinese market – loss making in fact. While most kind of banking institutions will forecast a return to profitability of China in 2024, we're not really seeing it play out yet."**
>
> *James Meyler*
> *Chief Executive Officer of ORIX Aviation*

FIG.9: AIRLINES BANKRUPTCIES/RESTRUCTURINGS IN 2023

Airline	Country
Airline	Country
Cascadia Air	Canada
Flybe	UK
Flyr	Norway
Novair	Sweden
Aeromar	Mexico
Viva Air	Colombia
Ultra Air	Colombia
Niceair	Iceland
GoFirst	India
Fly Gangwon	South Korea
Air Moldova	Moldova
Thai Smile	Thailand
Buta Airways	Azerbaijan
Swoop	Canada
MY Airways	Malaysia
JC International Airlines	Cambodia
Equair	Ecuador
Hi Air	South Korea

Source: AllPlane

FIG.10: NEW AIRLINES IN 2023

Airline	Country
Ghana Airlines	Ghana
Aerus	Mexico
Centrum	Uzbekistan
Air Samarkand	Uzbekistan
Sky Vision Airlines	Egypt
Air Moana	French Polynesia
ESAV Airlines	Ecuador
Yazd Air	Iran
JetSMART Colombia	Colombia
City Airlines	Germany
Silk Avia	Uzbekistan
Air1	Iran
Global Airlines	UK
Mexicana (2.0)	Mexico
Discovery	Germany
Valetta Airlines	Malta
AJet	Turkey
BeOnd	Maldives
NG Eagle	Nigeria
Naysa	Canary Islands, Spain
Bermudair	Bermuda

Source: AllPlane

Chapter Two

Aviation Finance

Airlines have been busy repairing balance sheets and working to decrease debts accumulated during the pandemic period. Higher interest rates are redefining aviation finance. There were modest levels of capital markets issuance during the first half of 2023, which only started to tick up again towards the end of the year.

The interest rate chart shows central bank base rates from the US, the EU and the UK, which shows a steep increase from almost zero at the end of 2021 to the end of 2022, followed by a shallower increase to the middle of last year when central banks began to hold rates around 5% for the US and the UK, and at 4% in the Eurozone.

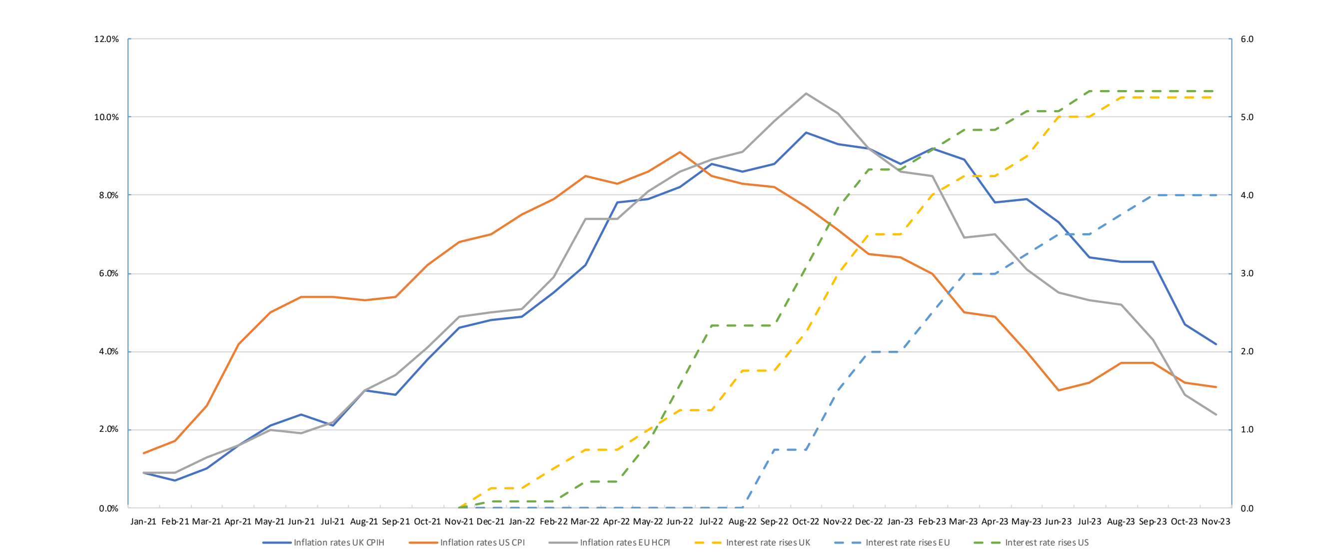
The consensus appears to be that interest rates will remain higher for longer and that they will remain stable for the near term so long as inflation remains under control. The chart shows the steep rise in inflation to mid-2022 when it started to decline as interest rate rose. The volatile geopolitical situation remains an inflationary risk, with fuel prices spiking on the back of escalating conflict in the Middle East and the Red Sea area, where Houthis rebels are restricting trade through the Suez Canal disrupting the supply of food and goods.

The steady rise in inflation has caused the cost of living to rise substantially. Even though inflation has begun to decline, that sharp rise is only now starting to feed into consumer loans and spending patterns. There is the concern that interest rate rises have not yet been materially passed through to consumers and that air travel spend may reduce to accommodate the general increase in borrowing. Low cost airlines – especially in the US – have referred to a softening of demand as the low fare sector is impacted by lower discretionary spending. Air travel is expected to continue to grow with many industry experts very positive for the future, but that growth rate experienced immediately after the pandemic is expected to "normalise" to pre-Covid levels.

Towards the end of 2022, when interest rates were ticking up and inflation was increasing, many aviation professionals had expected demand to fall off as spending reduced. Vinodh Srinivasan, co-head of the Structured Credit Group at Mizuho Americas, admitted that last year he "underestimated the desire for everyone to spend this last summer" and that one of the main reasons interest rates have remained high is because "the US consumer has not stopped spending". Srinivasan, along with many aviation bankers, believes that rates will stay at the current high level for longer. "I don't see it going up materially, but I don't see it coming down either," he says.

Back in October when his interview was recorded, JP Morgan's Streeter mentioned that the market was bracing for higher for longer (the 10yr Treasury in the US was near the cycle peak at ~5%). Checking back in with him in January for this publication and clearly the forecast for rates has shifted down since the Fed "pivot" in December 2023. With rates "not as high for not as long", the 10yr is now ~90bp below the October high and JP Morgan forecasts the 10yr to fall further from the current ~4.10% to 3.65% by YE24. 5yr all-in coupons for the lessors in the US$ bond market have correspondingly rallied with BOC Aviation recently printing a 5.0% coupon, Air Lease 5.1%, Avolon 5.75%, and Aircastle 5.95% amongst the deals issued year-to-date in 2024.

Ryan McKenna, chief executive of Griffin Global Asset Management (Griffin), has been forecasting higher-for-longer rates for some time but he has also been expecting recessions, which has not materialised thus far in the US or larger economies. "It will be an incredible success for policy makers if large economies are able to avoid a recession given all of the macroeconomic headwinds," says McKenna. "Inflation remains a serious problem and the geopolitical issues with Russia and Ukraine have been prolonged. The addition of the unfolding situation in the Middle East adds even more pressure to the global economy. Yet with all of that, global consumers – with US consumers leading the way – have continued to spend. That's really amazing in the face of such high interest rates and the



Source: IATA; International Monetary Fund, World Economic Database, October 2023

FIG. 11: INFLATION & CENTRAL BANK INTEREST RATES 2021-23

Air Lease celebrates inaugural sukuk

ALC's inaugural sukuk issuance represented the first ever offering of its kind into the Middle East market from a North American corporate and the largest sukuk from a US-based borrower in history. The issuance forms a part of ALC's funding strategy to diversify its investor base and tap into new pools of liquidity.

The offering consisted of US$600 million 5.85% trust certificates due April 1, 2028, paid semi-annually, pursuant to Rule 144A and Regulation S. The notes are rated "BBB" by both S&P and Fitch with a Stable Outlook and listed on the London Stock Exchange.

"This inaugural sukuk offering is a testament to ALC's strong credit profile and further evidence of our commitment to a well-diversified, global funding program," Gregory B. Willis, executive vice president and chief financial officer of Air Lease Corporation, said in an official statement upon closing. "We are grateful to our banking partners for their commitment and support in structuring and executing this landmark transaction."

Bank ABC, DIB, Al Rayan, Citi, Deutsche Bank, Emirates NBD, JP Morgan, KFH Capital and Warba Bank served as joint lead managers. Allen & Overy and Clifford Chance provided legal guidance.

"We are proud to highlight the strong liquidity in this region and the opportunity for other investment grade borrowers to raise funds at cost efficient rates. This transaction complements our strong airline relationships in the Middle East and we look forward to further developing our funding presence in this region," stated Verwholt at the time.

Bank ABC, one of MENA's leading international banks, acted as the sole arranger, structurer as well as joint lead manager and bookrunner for the sukuk.

Bank ABC, along with a number of regional and international banks listed above, announced the transaction on February 27, which was followed by a deal roadshow covering investors in the UAE, Qatar and the Kingdom of Saudi Arabia (KSA). As a 144A/Reg S issuance listed on the London Stock Exchange, the sukuk was also open to the global investor community. With the strength of the JLM group, strong market appetite for sukuks, and investment grade credit, the transaction closed 3.5x oversubscribed and priced successfully on March 6 at 5.85%.

Commenting on the landmark transaction, Christopher Wilmot, group head of treasury and financial markets at Bank ABC said on the deal's closing: "With ALC's robust aviation business and solid financial position, the issuance presented an attractive Shari'a compliant investment opportunity for regional investors. We are committed to opening this avenue of funding for our clients in our core US market, enabling them to access a wider pool of liquidity."

Greg Willis noted that the "quality and depth of demand for the transaction" had exceeded ALC's expectations, and that the deal highlighted the opportunities and strong liquidity that exist in the Middle East region.

The hugely successful sukuk, like so many new aviation deals, took several months to prepare and close, which was built on solid relationships and aligned strategies. Bank ABC, while active in aviation finance for the best part of two decades, traditionally had focused more on regional credits such as GCC flag carriers and airlines in the Middle East and Africa region. However, the bank was eager to capitalise on its unique geographical footprint operating out of Bahrain with a global reach into the US and Asia to explore more deals that brought in clients from outside the region in order to connect them with local investors. "We had a natural link with ALC since it has 10% of its asset base deployed in the MEA region and was already a client with our US branch," explains Wilmot, speaking to *Airline Economics* shortly after the deal was closed.

Verwholt notes that the ALC team had begun conversations with Bank ABC back in 2018 on future partnerships after the bank became part of the lessor's group of lenders as part of the company's annual extension to its revolving credit facility. "The whole genesis of Bank ABC entering the credit facility was to enhance our Middle East banking relationships and the fact that they were open to investing in new companies at the time. Bank ABC's team spent real time getting to know ALC as a company and understanding our financial needs."

The two companies continued to build upon their relationship until the global pandemic hit and discussions halted. Once the industry reopened, ALC realised that the Middle East region was flushed with liquidity and was worth exploring further.

"We had floated the idea [of a sukuk] to ALC before Covid but only got back in touch with them in September 2022 when we arranged a non-deal roadshow to gain feedback from local investors," says Wilmot. "The response was encouraging that a deal was possible."

"Bank ABC did a tremendous job shepherding us through the process and we found a very

ALC's inaugural sukuk was celebrated at the Airline Economics Middle East & Africa Aviation 100 Overall Deal of the Year at Growth Frontiers Dubai in September 2023.

warm welcome from investors," says Verwholt. Unlike a typical banking relationship that usually starts with a simple product like a loan, Bank ABC suggested a sukuk transaction that would get the market comfortable with ALC's credit profile and open banks and other Middle East investors up to more unsecured deals in the future."

Despite the warm investor reception, as Wilmot says, "the devil was in the detail". What followed was several months of structuring work marrying an Islamic Shari'a format transaction with a US corporate entity as an issuer. "ALC's large, unencumbered asset pool enabled us to structure a 100% tangible asset transaction, which is rare in the region where the average is between 30-50% tangible assets," explains Wilmot.

Bank ABC brought in another bank, DIB, to work together on the complex structuring process, which had to consider multiple jurisdictions with the region. "Once we had a feasible structure in place, we were then in a position to go out to investors and have more concrete conversations with investors to better assess demand," said Wilmot. "Once we were assured of that interest, we brought in several banks to assist with a wide distribution around the region. For example, we brought in Masraf Al Rayan bank to broaden interest in Qatar."

Following a true deal roadshow, the team was predicting a book size of around $1.2bn for an issue size of US$500 million. "We were pleasantly surprised that we built a book of $2bn and needed to upsize the issuance to US$600 million to keep all those investors onboard," adds Wilmot.

With such a large book, the deal could have been upsized further but, as Wilmot attests, as a new entrant to the region, the emphasis was on ensuring those anchor and initial investors were happy with their ticket size and also allowing them and other investors to assess the deal's secondary performance. "Many investors were keen to ensure that this wasn't a one-off deal, that ALC would become a repeat if not regular issuer in the region. We certainly hope that this is a starter programme for ALC, and we now have a proven programme for more lessors from outside the region to come and tap a new pool of investors," says Wilmot.

"We raised $600 million and had over $2.25bn in demand – 90% of that demand came from investors and banking partners that we had never engaged with before and which had never invested into ALC before. This is true diversification. It makes a big difference if you can raise capital at or inside comparable levels without cannibalising demand."

The sukuk priced at 5.85%, which based on ALC's previous capital market issuance looks high, but in the new higher interest rate environment, the price is essentially flat to slightly inside ALC's established issuance curve despite the expectation that there may have been a new issuer premium on this first deal in the region. "The pricing was five basis points inside of what US banks were quoting for a conventional investment grade deal at the same time, and in line with money we raised in the capital markets at the end of last year when rates were lower," says Verwholt. "We have had to reframe our expectations in the higher interest rate environment."

The deal also paved the way for future US or other foreign investment-grade corporate issuers into the region.

pressure from central bankers to cool the economy. The economy remains strong, but I am particularly concerned about the post Covid bounce back turning into a recession."

Higher interest rates have impacted aviation finance product selection during 2023. Some companies have held back accessing financing, especially in the capital markets, with the expectation that interest rates were going to fall. Since rates are poised to remain higher for longer and more stable, many aviation finance professionals expect to see more capital markets activity in 2024. In this new operating environment, airlines and lessors appear to have become more discerning in terms of the types of products they consider. Many stronger credits even paid cash for assets last year as they remain focused on deleveraging and insulating themselves from exogenous events.

Tom Baker, chief executive of Aviation Capital Group (ACG), believes that the leasing industry can use the higher interest environment to better understand their real cost of capital. "A better understanding would create more discipline around pricing; more discipline around the competitive dynamic in sale leasebacks or repricing second or third leases. ACG is ready for higher rates; we believe they will accentuate our competitive advantage. When rates were compressed, it was very hard for disciplined lessors with flexible capital structures and disciplined pricing to differentiate themselves when spreads were so tight. Now that things are really starting to differentiate, we think we will outshine our competitors."

CAPITAL MARKETS

There are two tiers of companies within the aviation finance sector – investment grade and non-investment grade airlines and lessors. The larger scale investment grade lessors have been able to continue to raise capital in the bond markets in 2023 despite the higher rate environment. "Interest rates have climbed much faster than expected but the debt capital markets are still there for investment grade rated companies," says ALC's Plueger. In the first quarter of 2023, ALC issued $700 million

FIG.12: AIRCRAFT LESSOR NEW BOND ISSUANCE 2023

Issuer	($MM)
AerCap	4,250
Griffin	1,700
Air Lease	1,675
BOCA	1,650
SMBC Aviation	1,650
Aviation Capital Group	1,600
Avolon	1,150
Aircastle	1,025
Macquarie AirFinance	1,000
FTAI	500
Castlelake	-
TOTAL	**16,200**

Source: JPMorgan

of 5.30% five-year senior unsecured medium-term notes due 2028, and completed its inaugural US$600 million sukuk offering, consisting of 5.85% trust certificates due 2028. Later in the year, ALC went back to the capital markets to issue C$500 million of 5.4% senior unsecured medium-term notes.

"If you are investment grade rated, like in all other times, the money's available," says Plueger. "The global debt capital markets remain open; they are robust. You just have to willing to pay what the market will give you."

BOC Aviation has been a prolific issuer in the capital markets and closed several large bond deals in 2023 – $500 million unsecured five-year notes, coupon of 4.5%, all-in yield of 4.627%, and $500 million unsecured ten-year notes, coupon of 4.875%, all-in yield of 5.015%, in May; followed by $650 million unsecured five-year notes, coupon of 5.75%, all-in yield of 5.917% in November. Rounded off with a $1.375bn club loan, the largest in its history, in October.

"We have that lowest incremental cost of borrowing of anybody in the market," commented Steven Townend, the new chief executive of BOC Aviation, who took over the reins on January 1, 2024. "For investment grade lessors like ourselves, we see a very strong market. At the same time as raising funds in the bond market, we have also been in the bank market. What is interesting for both of our most recent issuances

> **"If you are investment grade rated, like in all other times, the money's available. The global debt capital markets remain open; they are robust. You just have to be willing to pay what the market will give you."**
>
> *John Plueger*
> *Chief Executive Officer of Air Lease Corporation*

is the source of capital. Recently, we have seen a broader base in the bank markets. We have attracted investors from North America, Europe, Middle East and Asia in the bank facility, and for most recent bond issues, about 80% of investors were from Asian markets."

On the equity capital markets, AerCap was the most active player since the company completed the sell down of all remaining shares owned by General Electric (GE) following the lessor's acquisition of GECAS in November 2021.

The secondary offering of 26,721,633 of its ordinary shares by GE Capital US Holdings, a wholly owned subsidiary of GE, were sold at a price to the public of $65.25 per ordinary share. The 30-day option for a further 4,008,245 additional ordinary shares was exercised in full completing GE's exit from AerCap.

Goldman Sachs, Citigroup, Deutsche Bank, BNP Paribas, BofA Securities, JPMorgan, Credit Agricole CIB, Mizuho, MUFG and Société Générale acted as joint bookrunners, with BBVA, ING, UniCredit, Santander, Academy Securities, R. Seelaus and Siebert Williams Shank acted as co-managers for the secondary offering.

AerCap's Kelly said that the team had learned valuable lessons from the acquisition of International Lease Finance Corporation (ILFC) a decade earlier from AIG, which had also been structured as a share sale format with AIG owning a large stake in AerCap following the sale of ILFC. Those shares were subject to a nine to 15 month lock-up period but it was assumed that AIG would eventually sell its stake.

"We knew AIG was going to sell and we put an investor relations programme in place, but I don't think we understood the impact of AIG selling 45% of the biggest lessor in the world into a market that wasn't very liquid," admits Kelly.

AIG shares were picked up by hedge funds looking for short-term returns by capitalising on the upside in the stock price. Kelly describes those hedge fund buyers as a "bridge between the strategic owner in AIG to longer-term" investors. However, he says, the company didn't account for the volatility in the share price caused by hedge funds selling on any news item that deterred some longer-term investors. Kelly explains that the AerCap team made a very significant effort in the years from 2017 to 2019 to attract more long-term investors to the stock and away from the volatility caused by the hedge funds.

Leveraging on the hard lessons learned after the AIG sale, AerCap took a more measured approach to the GE share sale. "For the last two years, a very significant effort has gone into broadening the investor base for aircraft leasing equity," says Kelly. That effort has proven to be very successful since GE sold down close to $9bn in a relatively short eight month period, which needed a steady supply of investors. "We needed to make sure that we weren't in a situation where there was that much supply coming into a market where there were not natural buyers," says Kelly. "What we really wanted were the long only investors and that has been the dramatic change and what has driven up the stock price post the GE sale, which is the outcome we all really wanted and worked very hard to achieve."

At the same time as the GE share sale, AerCap completed a successful exchange offer for all holders of several existing notes due 2024 for new 6.450% senior notes due 2027. AerCap elected to exercise its option to adjust the cash component of the total consideration, in respect of the 1.750% senior notes due October 29, 2024, from $54.00 to $45.00 and, in respect of the 1.650% senior notes due October 29, 2024, from $68.00 to $57.50. As a result of the offering, AerCap also succeeded in smoothing out its debt maturities.

Airlines have continued to tap into the equity capital markets to raise capital. TUI Group was a substantial issuer in 2023 with a €1.8bn rights issue. TUI used the net proceeds from the fully underwritten capital increase to fully repay the remaining aid from the Economic Stabilisation Fund (WSF).

TUI paid off €420 million WSF's Silent Participation I – the group had already repaid the €671 million Silent Participation II in 2022 - and the remaining €59 million Warrant Bond was also redeemed. WSF received a

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Aengus Kelly
Chief Executive Officer of AerCap

Ashland Place closes inaugural loan ABS

Ashland Place Finance (Ashland Place) priced its inaugural aviation loan asset backed securitisation (ABS), APL Finance 2023-1, in December, which offered four tranches of notes secured by a static pool of aviation loans.

The quality of the portfolio of aviation loans resulted in tranches A through C being rated investment grade by KBRA, and the deal being oversubscribed. A healthy mixture of traditional aviation ABS investors as well as investors new to the asset class are reported to have bought into the deal.

Formed in September 2021, the Ashland Place platform, backed by Davidson Kempner Capital Management LP (DKCM), was set up with the specific aim of originating aviation loans. The team, led by veteran aircraft leasing and banking executive Jennifer Villa, has built up the Ashland Place portfolio with well-structured loans to quality borrower and underlying lessee credits and the specific long-term view of eventually securitising sections of the loan book. "This was always the plan," says Villa, speaking to *Airline Economics* on the day the deal priced. "We intend to be a continuing issuer in this space."

DKCM had this strategy in mind ahead of the formation of Ashland Place and has been pleased to see this idea come to fruition. Villa commented, "We see many opportunities for Ashland Place – we are continuing to originate and underwrite new loans even in this heightening interest rate environment. There is a need for the type of lending provided by Ashland Place, as demonstrated by our repeat customers."

The $324.3 million securitisation includes $238.2 million A notes, rated AA by KBRA, with a 67.9% loan-to-value (LTV) ratio based on the securitisation loan balance and 38.9% based on the collateral balance, with a weighted average life (WAL) of 1.61 years, which priced at I-curve +285 basis points (bps) with a 7% coupon and 7.705% yield. The $53.32 million B notes, rated A-, have a loan balance LTV of 83.1% and collateral LTV of 47.6%, a WAL of 2.93 years, and priced with a +355bps spread, 7.86% coupon and 7.99% yield. The $21.92 million C notes, rated BBB-, have a loan balance LTV of 89.3% and collateral LTV of 51.2%, a 2.93 year WAL, which priced at a +475bps spread and 8.5% coupon/9.19% yield. The BB- rated D tranche, worth $10.87 million in total, has a loan balance LTV of 92.4% and a collateral LTV of 53.0%, a 2.93 WAL, which priced with a 5% coupon/12.69% yield, an +825bps spread and sold at 81.96% of par. All four tranches of notes have a final maturity of July 2031.

Affiliates of both Ashland Place, which remains as the servicer of APL Finance 2023-1, and DKCM are retaining 100% of the equity of the subject transaction at closing.

The proceeds of the notes will be used to acquire a portfolio of 11 limited recourse loan facilities comprised of 26 loans, which are secured by 19 narrowbody aircraft, three widebodies and four narrowbody host aircraft engines on lease to 12 lessees located in 11 jurisdictions. The three largest lessees by loan balance are Corsair International, TUI Airways and Ethiopian Airlines.

The collateral has a weighted average age of 10.0 years (excluding the engines) and an initial appraised value of approximately $612.2 million based on the average of half-life base values provided by three third-party appraisers as of the second quarter of 2023. The appraisers are Collateral Verifications, Avitas and Morten, Beyer & Agnew.

As of the deal's cut-off date, the loan portfolio had an initial aggregate loan balance of approximately $350.8 million, an average asset balance of $13.5 million and a weighted average remaining loan term of approximately 2.8 years. The portfolio has a weighted average seasoning of 18 months. The initial portfolio balance includes $6 million for incremental extensions, and advances for certain assets that have taken place after the cut-off date.

ATLAS SP Partners is the sole structuring agent. Pivotal Corporate AMS is the managing agent, with UMB Bank acting as back-up servicer and trustee. Allen & Overy served as legal advisor to Ashland Place, and Milbank served as legal advisor to ATLAS SP Partners.

APL Finance 2023-1 will also feature an esteemed group of board members, including: Elizabeth Barry, former director & head of corporate affairs at Airbus Financial Services; Anthony Diaz, former president at CIT Aerospace; and Mark O'Kelly, group chief financial officer at ASL Airlines.

All loans in the portfolio were originated under the Ashland Place platform and are limited recourse, first lien, senior secured loans. The loans are structured with maturities shorter than or equal to the lease maturity of the underlying aircraft. There are also additional protections in place for the A note holders.

"We've sought to structure the underlying loans conservatively relative to what you often see in this space," says Villa. "The underlying airline counterparties are mainly flag carriers and tier one credits, with strong borrowing counterparties across the spectrum of the leasing community, each with equity in the assets. Furthermore, there is no remarketing risk in the portfolio like you typically face in vanilla lease ABS, as these loans are all either shorter than or co-terminus with the underlying leases."

The static loan pool is one of the main appeals of the Ashland Place aviation loan ABS and what assisted with the investment grade rating for the first three tranches including the subordinated C notes – a major achievement. "We received investment grade ratings for the A, B and C tranches, with the D rated BB-; you don't really see that in the lease ABS transactions," says Villa. "What we believe really resonated with investors from a risk-reward perspective is that on a metal LTV basis, the entire capital stack of this loan ABS fits inside the A note of a traditional lease ABS, and why the transaction has been so well received in the market."

> **"What we believe really resonated with investors from a risk-reward perspective is that on a metal LTV basis, the entire capital stack of this loan ABS fits inside the A note of a traditional lease ABS, and why the transaction has been so well received in the market."**
>
> *Jennifer Villa, Ashland Place*

Ashland Place 2023-1 is only the second aviation loan ABS to come to market. The first aviation loan ABS (SALT) was issued by Bellinger Asset Management and Stonepeak Partners LP in 2021, which secured the portfolio of aviation loans they acquired from National Australia Bank (NAB). APL Finance 2023-1 is an ABS loan structure but is a very different transaction. The NAB book acquired by the issuers in SALT had more loans of varying sizes, with minority lender and a mix of secured and unsecured. APL Finance 2023-1 was designed with the capital market refinancing in mind and, as such, has been carefully constructed with strictly secured loans, with one sole lender and primary originator in Ashland Place and, thus, similar documentation throughout which spoke to the rating agencies and ultimately the investors.

The transaction priced on December 12, 2023, with competitive yield across the debt stack despite the choppy market environment.

final amount of €750 million including compensation for the conversion rights and accrued interest and coupons. TUI's payments to the German state for providing the WSF stabilisation measures during the pandemic for interest, coupons and as compensation for conversion rights amount to around €381 million.

Sebastian Ebel, CEO of TUI Group, described this as a pivotal moment for the company, which had been "strengthened" and is now focused on "profitable growth".

In a quasi-equity raise, Air France-KLM monetised its Flying Blue loyalty programme with a $1.5bn transaction in November in 2023.

Under the deal, Apollo-managed funds subscribed to perpetual bonds issued by a dedicated operating affiliate of Air France-KLM that holds the trademark and most of the commercial partners contracts related to Air France and KLM's joint loyalty program (Flying Blue) as well as the exclusive right to issue "Miles" for the airlines and their partners. The perpetual bonds will bear a coupon of 6.4% for the first four years, with the ability to redeem with an overall financing cost of 6.75% on the first call date.

Air France-KLM will continue to manage and operate its loyalty program Flying Blue, and Air France and KLM will keep full ownership rights of their customer database.

The financing is accounted for as equity under IFRS. Air France-KLM said that this deal "materialises the steps implemented by the Group to restore its IFRS equity to positive by year end".

The transaction was upsized from €1.3bn to €1.5 billion on the back of what the issuers said was "strong investor confidence and the quality of Air France-KLM Flying Blue Miles issuance activity".

Steven Zaat, Air France-KLM chief financial officer, said that the upsizing of the quasi-equity financing represented a "significant step further to strengthen Air France-KLM's balance sheet at attractive funding terms" as well as "a strategic milestone and clear recognition of our successful Flying Blue program miles activity as well as its potential scalability".

Apollo partner Jamshid Ehsani said at the time the deal closed: "We are very pleased to be part of this inaugural European mileage capital investment with Air France-KLM. The transaction was well received by our investors, both those within the broad Apollo platform as well as select third-party investors, including sovereign wealth funds and multinational insurance companies."

As part of the transaction, Air France-KLM also committed to spend €100 million on sustainable aviation fuel over the next four years.

STRUCTURED FINANCE

Structured aviation finance deals are still not back to full force and issuance is likely to remain subdued for some time in the higher-for-longer interest rate environment. There was a single aviation asset backed securitisation transaction closed in 2023 from Willis Lease Engine Finance, with the seventh iteration of its WEST series of engine financings. Austin Willis, chief executive of Willis Lease, says that the ABS deal was "very well received" by investors because "our ABS deals have historically outperformed almost any other deal in the market through the pandemic, which is a testament to the performance of the company".

The broader ABS market is open but the economics for aviation assets – due to the high interest rate and lagging lease rates – currently do not compare to commercial banking products or alternative lenders.

For leasing companies, the environment is still not conducive to a successful aviation ABS issuance. "The ABS markets, unfortunately, are still not fully functioning," says Goldman Sachs' Lee. "There is some private placement issuance, but that market is very dependent on the quality of the underlying lessees, the age of the aircraft and the structure of the leases. This has made options for the sub-investment grade leasing companies pretty limited."

Mizuho's Srinivasan explains the problem with new aviation ABS issuance in more detail: "Prior to the pandemic, lessors could issue single-A bonds at 65% LTV at 2.5% yield," he says. "Today, you can barely get to 65% LTV on an on a decent aircraft portfolio at 7.5% yield.

The cash flows coming in have not really changed because lease rates haven't gone up enough to compensate. The only places where you could see an ABS deal is on older aircraft, where you can still find enough yield. Structural enhancements aren't going to move the needle; it's a matter of how much cash the aircraft generate. There's just a dearth of cash flow to support a higher amount of debt."

Until those economics change, Srinivasan notes that banks are being very understanding and have been supporting the sector by providing warehouses that are being "renewed and renewed again".

Although lessors are struggling to tap into the ABS market, financiers have found success using the loan version of the secured transaction. Following in the footsteps of SALT, which closed in 2019, Ashland Place came to market at the end of 2023 with a new loan ABS product, which it expects to have an enduring future in the aviation finance stable of products *(see section on previous page for more detail on APL Finance 2023-1)*.

Sub-investment grade lessors have opted mainly for warehouse financings, which Lee comments, is "effectively buying time for another market where rates are more constructive". He also sees other determined leasing companies that have been willing to "take near-term hits to their P&L with higher interest rates so that they can get to an investment grade rating".

Griffin is one of those companies seeking to both fund its growth trajectory as well as place the company on a first footing on that journey to investment grade.

In 2023, Griffin began the year with an upsizing of its $1.5bn warehouse facility to $2bn with 12 leading banks. Soon after, Griffin began its corporate ratings process with Fitch and S&P resulting in the company's inaugural corporate ratings of BB and BB-, respectively. The financing team led by chief financial officer John Beekman, also negotiated the terms of Griffin's inaugural unsecured bond issuance. The $1bn unsecured notes issuance closed in June, which is significant volume for a debut issuance by an aircraft lessor. Soon after the inaugural bond, Griffin also closed an inaugural corporate unsecured Revolving Credit Facility (RCF), which had commitments from 12 leading banks for $575 million. In the meantime, the company closed a $400 million credit facility in August with four banks dedicated to a new partnership with Rolls-Royce that acquired 17 engines. The team rounded of the year with its second unsecured bond offering for $400 million, which closed in November and was subsequently followed with a $300 million tap to that security at the very end of the year.

"We tried to navigate a challenging market for raising capital, but guided by a clear objective of achieving investment grade ratings, " says Griffin's McKenna. "We took meaningful steps towards unencumbering our balance sheet with an unsecured funding structure and remain committed to our investment grade financial metrics."

McKenna notes that Griffin's portfolio metrics with a long average lease term and a young average age, are already in step with the company's investment grade peers, the issue is scale. "The agencies have made it very clear that getting larger is required for investment grade issuers and we are going to add scale in a very methodical way," he says. "We don't need to do something transformational to get there. We have a very clear path for growth with the new aircraft delivering in our pipeline and we will continue to focus on our unsecured funding structure."

With the resumption of new aircraft deliveries, it was assumed that airlines – specifically US carriers – would again turn to raising debt using the tried-and-tested enhanced equipment trust certificates (EETCs). However, over the past few years cash rich airlines have chosen to use cash to fund new deliveries or existing debt stacks. This trend continued into 2023, with only one largescale EETC being issued by United Airlines in June, although there was a private deal closed by first-time issuer Republic Airways secured on a portfolio of spare parts in July. ASL Aviation also raised $155 million with an enhanced equipment trust loan transaction in April, which was a unique structure that supported the conversion of passenger aircraft to freighters.

COMMERCIAL BANKING MARKET

Airlines and lessors have continued to develop relationships and issue more debt in the commercial banking market in 2023, despite the increase cost. As Greg Lee notes there has been an abundance of warehouse facilities closed over the past year. However, the cost of debt using these structures is also rising, which Castlelake's McConnell comments is creating challenges for some leasing companies.

"The warehouse market is challenged," says McConnell. "The ABS market is extremely challenged and it is unclear if it will really come back. We believe that many investors that are reliant on that funding model are struggling to close transactions. We have seen or heard of many differenttransactions that fail to close after LOI execution due to funding issues." McConnell sees these companies losing access to sources of both debt and equity, leading in some cases to the forced sale of assets. This situation has increased the importance of execution risk for aircraft transactions, which favours larger players with a strong track record and certainty of execution. This is essential in such a hot trading market where airlines are clamouring for lift.

Alternative lenders have been filling the void for both equity and debt financing, which has continued over the past year as certain banks retrench to protect balance sheets and focus on fuel efficient new equipment and relationship clients. There is the sense that these alternative lenders tend to play in more niche areas where there are higher yields.

Greg Lee believes that a gap remains between where "the alternative or private credit sources of capital need to earn their cost of capital and what economically makes sense given the low these rate factors", which he says is what has prevented alternative capital from becoming a bigger part of the market to date.

Non-payment insurance (NPI) products have also continued to grow in popularity, in some cases replacing the export credit-backed transactions that are popular for lower tier credits.

Several companies now offer NPI products from Marsh's AFIC and Balthazar products, to newcomer Itasca Re as well as ACG's Aircraft Financing Solutions (AFS) guarantee. These are complementary to the bank financing market and are now widely regarded as a substitute for export credit financing, which is becoming more selective and export credit agencies are now acting within their original missions as lenders of last resort.

Both NPI and export credit supported transactions require banking support, which has continued over the past year. These products are popular with tier two airlines and alternative lenders have also recognised a market opportunity. Castlelake has invested in this product family with the creation of Itasca Re. "Itasca Re is an NPI provider that enables what we believe to be the lowest cost of debt financing to airlines and leasing companies through an insurance wrapped structure with a single A rating," explains Joe McConnell. "This is a unique product and this business is rapidly scaling and when banks are pulling back and when alternative lenders in many cases are relatively expensive, we believe Itasca Re is a great solution for owners and buyers of aircraft that want a lower cost of debt financing, and they want it from a party that can provide closing credibility and a creative, custom tailored structure."

Engine assets have increased in popularity with investors and there have been some very large engine portfolio financings in 2023.

Shannon Engine Support (SES) – a 50/50 joint venture between AerCap and Safran – concluded an $875 million engine portfolio financing in a club-deal of eight banks. This landmark transaction, which is the largest aircraft engine portfolio financing closed in the market to date, finances a pool of the latest technology LEAP-1A and LEAP-1B engines, designed to meet the challenges of decarbonising air transport.

This was the first secured financing by SES. Credit Agrciole-CIB acted as global coordinator on this deal and was mandated lead arranger and bookrunner with Natixis-CIB; BNP Paribas, CIC, Natwest, Société Générale, and SMBC were also MLAs, with Bank of America as a lead arranger.

Griffin and Bain Capital Special Situations (Bain Capital) have also entered the engine market with an agreement to acquire 17 new technology Rolls-Royce Engines, including Trent XWB-84s, Trent XWB-97s, Trent 1000s, and Trent 7000s. The engines will be owned by a newly-formed standalone entity and used as spares by the Rolls-Royce global customer base.

Bank of America led the acquisition financing of the engines, with key commitments to the facility from Mizuho Bank, Citibank, and Goldman Sachs Bank.

"The warehouse market is challenged. The ABS market is extremely challenged and it is unclear if it will really come back. We think many investors that are reliant on that funding model are struggling to close transactions. We have seen or heard of many different transactions that fail to close after LOI execution due to funding issues."

Joe McConnell
Deputy Co-Chief Investment Officer of Castlelake

SUSTAINABLE FINANCING

Sustainability-linked loan financing has expanded in the past year and is being driven by the commercial aviation banks.

In December 2023, CDB Aviation, a wholly owned Irish subsidiary of China Development Bank Financial Leasing (CDB Leasing), entered into an inaugural Sustainability Linked Loan (SLL), anchored with a $625 million syndicated term loan facility.

"This innovative facility marks a landmark transaction for the aviation finance space," said Jie Chen, CDB Aviation's Chief Executive Officer. "We're thrilled to have leveraged our comprehensive sustainability strategy, with a particular focus on the activities across the Environmental and Social aspects of our operations, to secure this first major sustainability-linked loan syndicated facility among aircraft lessors."

The SLL parameters of the facility are contingent on the satisfaction of Sustainability Performance Targets (SPTs), which are based on the lessor's three Key Performance Indicators (KPIs). These include two strong Environmental and one Social KPIs related to reducing the carbon intensity of CDB Aviation's fleet, focusing on the most fuel-efficient aircraft; increasing the share of new generation aircraft in the lessor's fleet, pursuing its target to reach 60% of new generation aircraft (by number of aircraft) by the end of 2025; and increasing the level of Diversity, Equity, and Inclusion (DEI)-related training for the workforce.

Moody's Investors provided the Second Party Opinion as to the appropriateness of the KPIs and SPTs, confirming the conformity of the facility with the Sustainability Linked Loan Principles (SLLPs), with a best-in-class SQS2 rating.

The facility was financed by a group of mandated lead arranger banks, including: Crédit Agricole-CIB (CA-CIB), BNP Paribas, HSBC, Natixis, China Minsheng Banking Corp., China Guangfa Bank and China Construction Bank.

CA-CIB acted as sole sustainability agent, as well as lead sustainability structuring advisor jointly with BNP Paribas and HSBC. Natixis acted as sustainability structuring bank. CA-CIB also acted as agent of the facility. Milbank acted as counsel to the lessor, while Allen & Overy (London) acted as counsel to the lenders. JunHe and Matheson acted as PRC and Irish counsel, respectively.

"Delivering on our platform's ESG vision and responsibilities, this facility advances the sustainability of our business and enhances our ability to contribute to progress in reaching the industry's net-zero target. We're committed to being a leader on ESG matters and efforts, managing our impact as a business and maximizing our influence to help drive positive change in the aircraft leasing community," said Chen.

Other issues in the SLL space this year have been Turkish Airlines, Cathay Pacific, Wizz Air with a sustainability-linked Japanese Operating Lease with Call Option, Air France-KLM with a sustainability-linked RCF, and easyJet with an ESG-linked EDG facility, which has KPIs related to a reduction in the carbon emission intensity of easyJet in line with the Group's SBTi validated target. And many more.

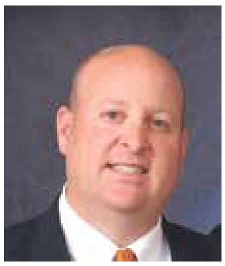
Mainstream banks are committed to sustainability targets and, in line with this strategy, are focused almost exclusively on new technology assets.

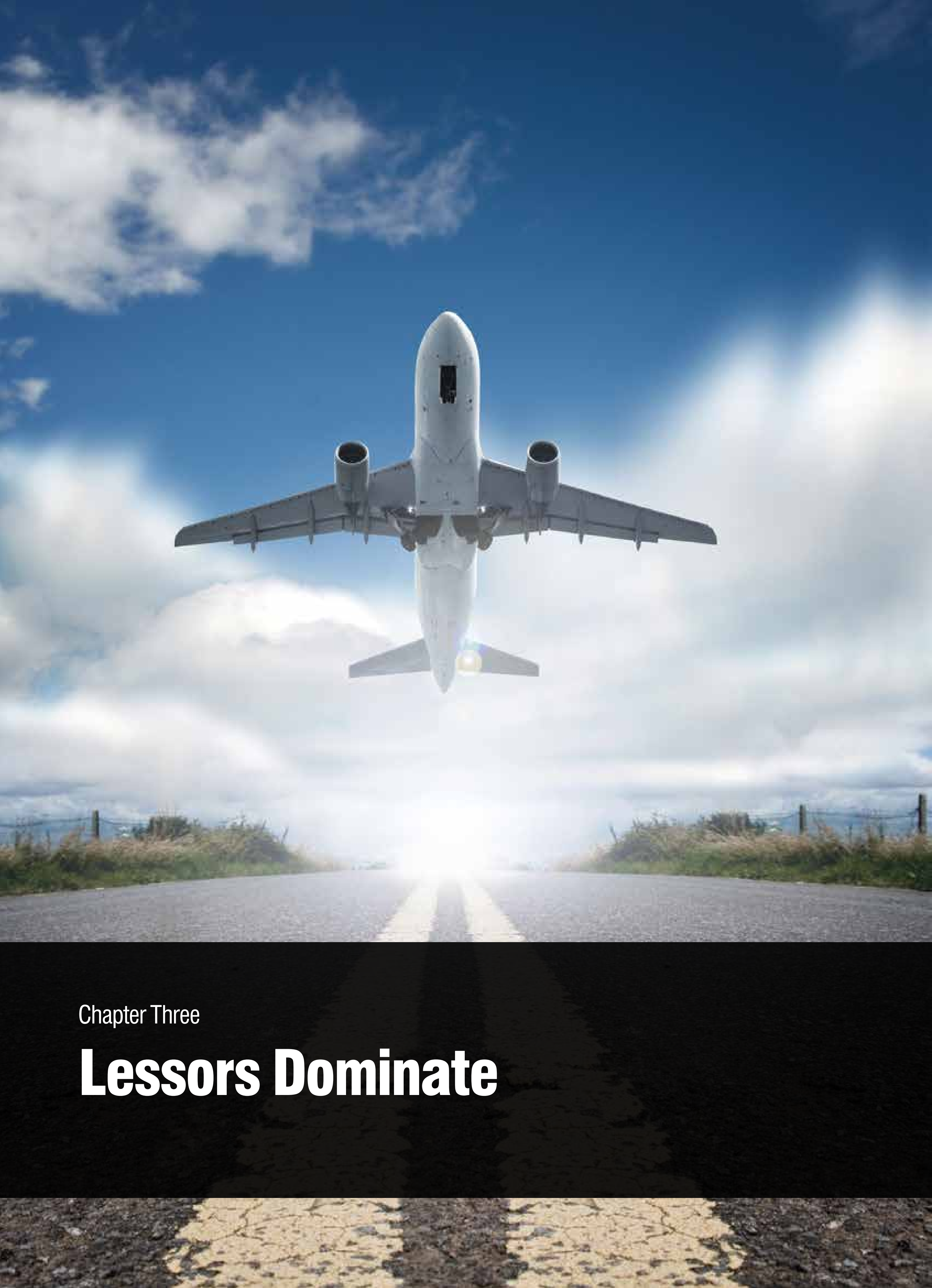
"Some lenders have set targets to finance only new, fuel-efficient, more environmentally-friendly equipment," says Carlyle Aviation's Korn. "If you want more accessibility to finance, you will need to focus on those assets that are in demand. We see strong push back from the banks to encourage us or provide benefits for purchasing and financing new technology aircraft. But we need to take a step back and realise that the industry doesn't have enough assets to service demand so premature retirement of older aircraft is not feasible."

Many of the larger aviation commercial banks are signed up to the Climate Aligned Finance Initiative with RMI and the Renewable Low Carbon Fuel Alliance roundtable sponsored by EU Commission, which will reveal its framework later this month solidifying sustainability financing measures for aviation assets.

"Some lenders have set targets to finance only new, fuel-efficient, more environmentally-friendly equipment. If you want more accessibility to finance, you will need to focus on those assets that are in demand. We see strong push back from the banks to encourage us or provide benefits for purchasing and financing new technology aircraft But we need to take a step back and realise that the industry doesn't have enough assets to service demand so premature retirement of older aircraft is not feasible. "

Robert Korn
President of Carlyle Aviation Partners





Chapter Three

Lessors Dominate

Aircraft leasing companies have experienced a stellar year in 2023. With demand outpacing supply, leasing fundamentals have improved substantially, translating to a solid bottom line for many of the largest lessors.

"I cannot remember a time in my almost 40-year long career when I have seen such strong demand and such tightening supply," says ALC's Plueger. "Manufacturers are sold out for years ahead, which is causing all sorts of additional planning requirements for the airlines."

ALC is now 100% placed for all of its deliveries to 2025, which includes all passenger widebody aircraft, and is also reporting strong demand for its older aircraft on the secondary trading market.

Most lessors have a much more positive outlook for airlines than equity investors and are confident that demand for air travel will continue to grow so long as they can access additional capacity even with continued production and delivery delays as well as aircraft groundings caused by manufacturing defects.

"There is no problem around demand," says AerCap's Kelly. "From speaking to airline CEOs, the demand is there. The question is at what price level. From an aircraft lessor's perspective, whether an airline makes a billion dollars or zero doesn't impact how much they pay a lessor. What we need to make sure is that demand is being serviced."

The supply chain challenges and disruption caused by manufacturing and engines defects – discussed in detail in the following chapter – have created immense demand for aircraft from airlines keen to expand capacity to tap into that continued spike in demand.

"Providing a top class service to our customers is vital," says Kelly. "The real issue with delays is when a customer has a flight schedule booked for next summer, they have hired pilots, ground crew, catering airport slots based on a certain level of capacity. If that capacity does not show up, if they don't get the aircraft or if they get the aircraft and it breaks down, that's a huge issue, because they can't get out of their fixed cost base. That's the real issue with the delays."

Throughout the pandemic period, airlines have proven to be adept at dealing with adversity and pivoting quickly to continue generating revenue or raising debt even in the deepest crisis. However, dealing with such surprise delays is a big problem. Kelly has called on the OEMs to ensure they inform customers of delays with as much notice as possible so they can plan on longer periods of downtown, something he says they have not been doing to date.

"[The OEMs] have a blatant disregard for their customers," says Kelly. "They're not going to hit the production targets at Airbus. Pratt & Whitney are not going to meet the turn times on their shop visits this year…. The most important thing for customers is to be able to plan with certainty. And the OEMs have to realise that there is a ceiling on what they can produce. The engine guys have to realise there is already tremendous strain in the MRO network. When you have a system that's strained and piling more on top of it, things rarely go well."

Cognisant of the continued supply chain pressures, airlines are seeking to secure capacity outside of their normal fleet plans to plug the gap caused by productions delays and AOGs due to the required engine maintenance. "On the new aircraft side, airlines are extending their commitment horizon up to 2030-2032 to lock up slots," says Avolon's Cronin. "We have seen manufacturers being more assertive around taking slots back from airlines that they don't think need them. We are seeing scarcity of lessor orderbooks and rentals and asset values rise. We are also seeing enormous demand on the used end of the market, with the value of greentime in particular engines increasing. But also generally aircraft lives are being extended and residual values are rising across the board."

The defining trend in aircraft leasing over the past year has been the proliferation of existing lessees seeking to extend leases rather than hand back aircraft at the conclusion of a lease term. Plueger reports 100% renewal rate for ALC's leases as airlines seek to retain capacity.

The extension of existing leases has been a common theme in interviews with all chief executives of aircraft lessors for this report.

"Airlines are keeping the aircraft they have because they cannot get the new aircraft from the manufacturers," says ORIX Aviation's Meyler, who confirms that ORIX has extended the leases of approximately 50 aircraft over the past

FIG.13: TOP 10 AIRCRAFT LEASING COMPANIES (BY PORTFOLIO VALUE)

Rank by Value	Indictive CMV (HL$bn)	Operating Lessor	Single-Aisle	Twin-Aisle	Regional Jet	Turbo Prop	Backlog	Total Portfolio
1	52.0	AERCAP	1,425	301	87	16	334	1,829
2	26.8	SMBC AVIATION CAPITAL	667	75			265	742
3	19.6	AVOLON	455	124	7		423	586
4	23.5	AIR LEASE CORPORATION	429	133	2		332	564
5	16.5	ICBC LEASING	433	55	39		130	527
6	16.8	BBAM	375	112				487
7	17.8	BOC AVIATION	368	93			207	461
8	11.1	DAE CAPITAL	301	53		67	63	421
9	11.3	AVIATION CAPITAL GROUP	369	15			108	384
10	7.8	CARLYLE AVIATION PARTNERS	344	38			20	382

Source: Cirium

FIG. 14: TOP 30 AIRCRAFT LEASING COMPANIES (BY PORTFOLIO NUMBER)

Rank	Operating Lessor	Single-Aisle	Twin-Aisle	Regional Jet	Turbo	Turbo Prop	Backlog	Total Portfolio
1	AERCAP	1,425	301	87	16	1,829	334	52.0
2	SMBC AVIATION CAPITAL	667	75			742	265	26.8
3	AIR LEASE CORPORATION	429	133	2		564	332	23.5
4	AVOLON	455	124	7		586	423	19.6
5	BOC AVIATION	368	93			461	207	17.8
6	BBAM	375	112			487		16.8
7	ICBC LEASING	433	55	39		527	130	16.5
8	AVIATION CAPITAL GROUP	369	15			384	108	11.3
9	DAE CAPITAL	301	53		67	421	63	11.1
10	BOCOM LEASING	265	32	6		303	92	10.4
11	CDB AVIATION	231	43	19		293	164	9.9
12	JACKSON SQUARE AVIATION	192	25			217	21	8.2
13	CARLYLE AVIATION PARTNERS	344	38			382	20	7.8
14	CES INTERNATIONAL FINANCIAL LEASING	129	45	1		175		7.7
15	AVIC INTERNATIONAL LEASING	141	25	33	20	219		7.1
16	CASTLELAKE	198	52	8	9	267		6.8
17	CMB FINANCIAL LEASING	153	22	7		182	67	6.6
18	ORIX AVIATION	167	37			204		6.2
19	AIRCASTLE	227	20	19		266	11	5.7
20	AVILEASE	164	2			166		5.5
21	CHINA SOUTHERN AIR LEASING	111	35	7		153		5.4
22	CHINA AIRCRAFT LEASING COMPANY	175	16	2		193	158	5.1
23	CCB FINANCIAL LEASING	134	18			152	110	4.8
24	GRIFFIN GLOBAL ASSET MANAGEMENT	47	14			61	5	4.0
25	JP LEASE PRODUCTS & SERVICES	80	11			91		3.7
26	MACQUARIE AIRFINANCE	185	12	2		199	66	3.7
27	ALTAVAIR	45	68	4		117		3.5
28	AERGO CAPITAL	72	41		46	159		3.1
29	ALM - AIRCRAFT LEASING & MANAGEMENT	67	11	12		90		3.0
30	NORDIC AVIATION CAPITAL	13		104	167	284	34	2.7

Source: Cirium

two years. “Airlines know if they don’t seize the opportunity to keep what they have, those planes will be taken up by other airlines,” he says.

Mike Inglese, chief executive officer of Aircastle, observes that in a normal cycle year, a ratio of extension to transition of an aircraft on lease is normally 40:60 but in the last year he says this has increased to 70:30. “The number of customers looking to extend is a much higher percentage for us, which is a great outcome,” he says. “Transition costs are much less to extend an aircraft lease with an existing lessee. There’s no downtime; there are no surprises around engine borescopes and other things that can creep up.” Inglese adds that extensions are even more welcome since transitioning leases is taking much longer to complete in this market due to the supply chain constraints in the MRO market, which is making shop visit lead times much longer.

Aircraft leasing company chief executives all refer to the production gap created during the pandemic of roughly 3,000 aircraft, and also acknowledge that with the continued supply chain delays and manufacturing defects, that shortage will only continue to increase. “Airlines are going to have to keep midlife planes flying longer; aircraft that would have been returned, maybe with a balloon payment that’s due or which would have been sold to repay debts, will also be extended,” adds Meyler. “Debt terms will be refinanced and extended, which in general is a good situation for all parties, save for the manufacturers.”

Meyler notes that lease extensions for older equipment will be at a lower lease rate than new aircraft deliveries, a positive for airlines' cost base and they will be able to extract more value from their existing fleet.

While the enhanced demand and trend for lease extensions is a positive for lessors in that lease rates and asset values are rising, Plueger says that he would trade some of that demand for "more stability and getting aircraft on time" to be able to deliver them to his customers.

His sentiments are echoed many times by his peers. "Growth will be a challenge. Access to metal will be a challenge; it's just something we will need to manage," says ACG's Baker. "We are seeing increases in our asset values. We are seeing strong demand in our secondary market trades, despite higher interest rates, and very strong bids in the single aisle market. But we would prefer more orderly deliveries from the manufacturer."

The GTF issues have created increased demand for spare engines and lease rates have also increased but the same issues have also resulted in a deficit of spare engines creating a challenge for engine lessors. "The latest technology entry-to-service durability and reliability issues have made it very difficult for us to get our hands on new engines because the OEMs are channelling them to the customers that need them the most," says Richard Hough, chief executive officer of Engine Lease Finance Corporation (elfc). "It is not a properly functioning market. The engine OEMs are trying to keep as many of aircraft flying as possible. At present, we replace that inability to get new engines from the manufacturers by financing additional sale-leasebacks of engines that are being delivered to customers. The supply of used equipment has also dried up due to shortages of supply caused b a combination of greentime burnoff and blockages in the MRO supply chain, which has pushed up lease rates."

Hough notes that engines have always been a very resilient product - they are liquid and retain their value well throughout cycles, which is why the sector has been attracting more investment over the years.

Engine leasing has evolved with aircraft leasing but the number of dedicated engine lessors remains small due to the technical nature of the product raising the bar for entry and success. "Engines are a proportionately much more technically challenging product to invest in than aircraft," says Hough. "You can lose more of your total asset value very quickly through the engines maintenance and LLP [limited life parts] value, particularly if you don't have the paperwork right, or the condition is compromised. You need specific technical expertise to be able to manage an engine portfolio."

Many of the engine lessors benefit from strong parent companies, which means they do not need to raise funding. Hough notes that elfc's strong parentage with Mitsubishi HC Capital (MHC) has been an advantage for the company and facilitates access to the Japanese investor pool for JOLCO leases. "The appreciation of the US dollar against the Japanese yen has, has seen the cost in yen increase," he says, "which combined with the higher prices for latest technology engines, places those products in a sweet spot for small investors in Japan who want to put their money to work in this sector."

Much has been discussed in recent months about the lag between the sharp rise in interest rates and the much slower increase in lease rates. The supply chain squeeze on capacity has served to accelerate the growth in aircraft and engine lease rates with all companies reporting a strong uptick.

"Lease rates are up 25-30% in dollar terms," says SMBC Aviation Capital's Barrett, "which has been driven by a number of factors including the rise in interest rates as well as the increase in demand for airplanes."

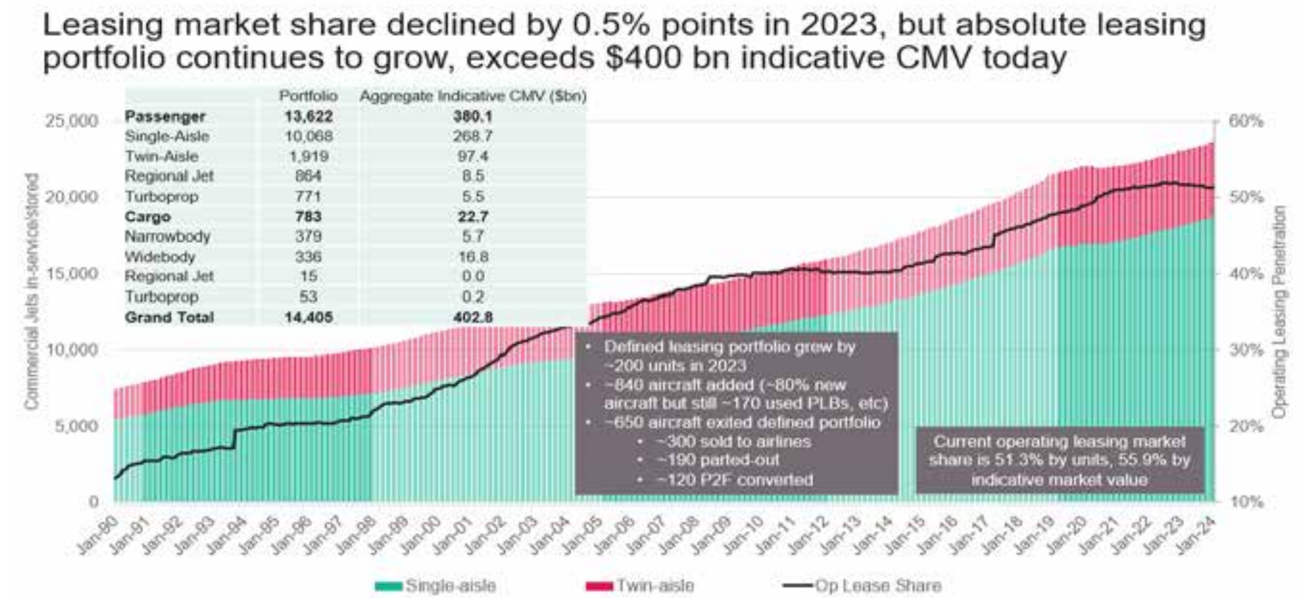
The main costs for aircraft lessors are the price paid for aircraft and interest rates on debt. Those costs are then passed through to the airline customers. Lessors with leases expiring or on shorter leases have been able to successfully increase their rates following transition to new customers or in some instances when executing extensions, other companies have escalation policies written into their longer leases, which again enables costs to be passed on. However, where lessors have placed aircraft on long leases with airlines before the interest rates spiked with no escalation policies, that dynamic has led to a lag in lease rate increases.

Although lease rates are rising, it remains a very competitive market for aircraft lessors, which makes passing on those higher interest rate costs more difficult. Moreover, the pace of the interest rate rises over the past two years made it even more difficult to pass on those costs to the customer.

"The question for many lessors is the pace for repricing leases and matching those rates with the cost of capital that has been moving rapidly," says Griffin's McKenna. "There is certainly demand for lease extensions given the constraints on new delivery volumes It will be interesting to watch how production rates move relative to fundamental market demand for aircraft."

With interest rates now more stable, lease rate calculations are reported to be increasing. "Airlines are accepting that ultimately they do need to pay more for their leases based on the increase in interest rates," says Meyler. "Those planes are delivering this year or next that have locked in those rises." He explains further that rates are now rising on sale-leaseback deals, which had been an anomaly to this trend since most deals continue to attract competitive bids from several lessors. Meyler says the current supply-demand challenge is altering the competitive dynamic with sale-leaseback rates, adding that they "have definitely moved up from where they were, but are not dollar for dollar where they should be" due to lessors with locked-in capital at low interest rates still able to outbid the market.

Engine lessor Willis Lease Finance, which has been experiencing increased demand for spare engines due to the issues with the GTF, follows a policy of keeping half of its fleet on shorter-term leases. "We have been taking advantage of the strong market to improve lease rates," says chief executive Austin Willis. "But not into a range that's considerably higher than what it was pre-pandemic; it has just been more of a recovery. We



Source: Cirium

FIG. 15: LEASING MARKET SHARE

have historically had about 50% of our portfolio on short-term leases, which has served us well. We are putting some more of the engines on longer term leases, but the intent is to really keep that balance of about 50% and it helps us in a few different ways. It keeps us in front of the customer, so we have our finger on the pulse of what's going on with the customers all the time, which conversely enables us to be better buyers of assets. It also helps us to reprice our assets based on demand."

Lease rates are ticking upwards but Meyler says many are accepting of the new rate environment due to the constrained supply. But it is also true that airlines still have a lot of options for securing aircraft rather than operating leases.

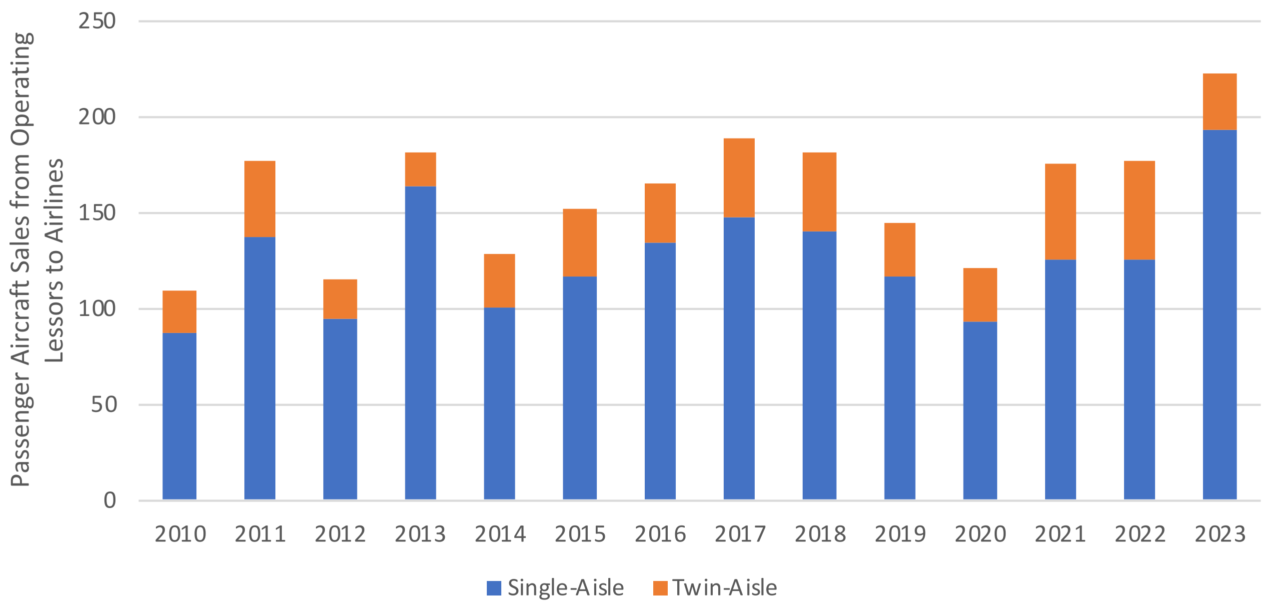
Robert Martin, who retired as chief executive of BOC Aviation at the end of 2023, noted that the Singapore-based lessor had seen a change in the preference for leasing aircraft once airlines again turned profitable. "Higher interest rates and the supply and demand element has pushed up lease rentals and lease rental factors," he said. "During the pandemic and post-pandemic, we have seen that the percentage of leased aircraft in fleets has ticked upwards and that proportion has grown… Our belief was during the pandemic and the period just after that the number of aircraft owned by lessors would go up significantly as it has. But once we reach the point of airlines turning profitable, particularly in the USA and UK, there are tax benefits for people owning their aircraft where they can take accelerated depreciation in the first year." Given this trend, during his time at BOC Aviation, he saw a lot of demand in 2023 for finance lease products. "There will be more of a balance between operating, leasing and owned aircraft going forwards," he says. "I don't see another big jump in operating leasing share because airlines are leaving tax benefits on the table if they just use operating vessels."

The leased proportion of the global fleet is generally considered to have exceeded 50%, with some saying it has reached as high as 60% during the pandemic. Cirium Ascend Consultancy measures the leased fleet by the number of passenger aircraft in leasing management compared to the global fleet. "For sure that exceeded 50% during the pandemic," says Rob Morris, but notes that in 2023 the share reduced by 1.5 percentage points. Morris attributes this decline to the recent trend of lessors selling aircraft off lease to airlines to provide airlines with certainty of a fleet and cost control.

"Around three times as many aircraft were sold off lease to airlines in 2023 than were sold the same period in 2022," says Morris. "That will drive a temporary blip downwards, but that's measured in units, which is about 52.1%. Measured in value, the share is about five percentage points higher because lessors are typically owning new aircraft."

Morris notes that leasing companies have been acquiring 60% of new technology equipment through new deliveries, about 25% as deliveries from their own orderbooks, and about 35% through sale and leaseback transactions. Due to the backlog in deliveries, however, Morris says it is unlikely that the leased share of the world fleet will reach 60% based on units "anytime in the next five, six, or seven years" but he expects it to continue to grow "incrementally".

Firoz Tarapore, chief executive officer of Dubai Aerospace Enterprises (DAE), recognises that airlines are rebuilding their capital profitability but believes that airlines strong multi-year performances for that profitability to translate to "deployable capital", meaning they will seek to finance their own aircraft rather than lease. "If airline profitability continues on for another two or three years, we will



Source: Cirium

FIG. 16: AIRCRAFT SALES FROM LESSORS TO AIRLINES

The chart (Fig.16) seeks to visualise the growth of sales of aircraft from operating lessors to airlines by drawing data from Cirium's database that shows where the ownership of an aircraft has moved from a lessor to an airline. It should be noted that there is a lag in this data set as aircraft are re-registered and researchers identify new owners of aircraft. By the end of the first quarter of 2024, the data is expected to be higher than shown for 2023. But even in this chart shows clearly that there were 50% more single-aisle sales to airlines in 2023 than in the two preceding years.

see airlines flexing their capital muscle and at that point they will have many more choices. In this interest rate environment and with new technology aircraft, they might decide to keep the metal exposure, or they might decide to fund themselves. It's a little bit unclear to us as to whether this is a structural change or change that was necessitated by the marketplace. Either way, for us as an aircraft lessor, it doesn't make too much of a difference because the pie keeps on growing."

The growth in the leasing share of the world fleet has been boosted by a high volume of sale-leaseback (SLB) transactions between airlines and lessors following the pandemic, which is predicted to continue into the near-term future since access to the capital markets remain limited to investment grade players and as airlines seek to diversify their portfolios, while enjoying access to 100% financing that leasing offers.

"I see the leased share of the fleet continuing to creep up," says Norm Liu, chief executive officer of Nordic Aviation Capital. "People recognise leasing as 100% financing. This isn't just operating leases, for JOLCOs and finance leases as well are all growing in popularity. You can preserve your cash by leasing aircraft and also lessors have slots. Also a lot of those mega orders, from Indigo etc, have relied heavily on leasing for various factors but ultimately it is a residual risk game."

Although some of the major airlines are flush with cash and have been seen to pay for aircraft deliveries without financing, the leasing channel will always form part of a diverse portfolio financing strategy, at least for larger airlines.

"Airlines do have a lot of cash," says Marjan Riggi, managing partner StageWings, "but they are also much more leveraged. In a normal cycle, they probably would have done more share buybacks but they haven't even though they are so flush with cash." Riggi points to the fact that although lessors own half of the world fleet, they only account for 20% of the orderbook with OEMs, which means sale-leasebacks with airlines will remain a major funding option for airlines.

Pressures on aircraft supply are driving up asset values. With the larger lessors unable to access a steady stream of new deliveries since the pandemic, secondary market trading seized up initially but it has eased in recent months. Over the past year, the largest lessors have all reported strong gains on sales of used aircraft due the asset values being boosted by the short supply of aircraft.

"Aircraft values are strong," says SMBC Aviation Capital's Barrett. "The tightness in the market is flowing through to aircraft values, even in a high interest rate environment. This is informing our aircraft trading strategy. We have always been an active trader of aircraft – we have an excellent trading team based around the world – and we will lean into that market if we think there's good value represented in the market relative to the long-term cycle but we will try to strike a balance. If prices are good, we will continue to trade into that market."

There is a sense that the rapid escalation in interest rates and inflation that made it difficult for owners to accurately price their assets, leaving buyers and sellers wary about taking on interest rate risk, has abated somewhat with the stabilisation in rates. "People are starting to be more active," says Aircastle's Inglese. "They are using age-old tricks to contain the movement in price between agreement and actually closing transactions."

Goldman Sachs' Lee offers a reminder that there are two sides to every trade and that even though lessors are reporting strong trading activity and gains on sales, buyers that can afford those higher prices will be fewer than pre-pandemic. "The numbers of buyers interested in buying aircraft are lower given higher interest rates; the prime buyers of aircraft in this market are companies that have strong balance sheets and access to investment grade debt," he says. "When values are higher, volumes are lower."

Spot market prices for aircraft depend very much on the asset type but also its remaining lease term, says Carlyle Aviation's Korn. "Values have certainly gone up, but whether they have gone up by 1% or 20%, neither buyer nor seller has found to answer that question," he says. "There is definitely upward pressure on lease rates and upward pressure on prices due to the supply-demand situation. Selling an aircraft with a five or six year lease remaining – with that contracted cashflow – the buyer is buying a residual that will be normalised in the next five or six years so it shouldn't have a significant effect on the value of the asset. If you're selling an aircraft that has a one year remaining lease, it could certainly have an effect on its value given the demand for aircraft."

For Cirium, the recovery in asset values has been slower but they are now back to levels seen pre-pandemic on a fleet weighted constant age basis, but values of lease encumbered assets are more difficult to estimate since it depends when the lease was negotiated. "A significant number of the leases that are committed today were either written pre-Covid or restructured during Covid," says Morris. "If lessors had their time again and knew what they know today, they might have preferred not to agree to such a long extension of that restructured lease because of the opportunity today to place aircraft into leases at much higher rents, which will bring lease encumbered valuations up."

Castlelake's McConnell recognises the complexities with aviation asset values. "Lease rates are a lot higher today than they were over the last few years but that does not mean that asset values should

Simon Cooper, CEO of Corporate, Commercial & Institutional Banking and Europe & Americas at Standard Chartered, shakes hands with AviLease CEO, Edward O'Byrne.

automatically be higher," he says. "It is true for aircraft that are coming off lease within the next 12 to 24 months, but interest rates are a lot higher, some 300 or 400 basis points higher. When you own long-term contractual cash flows, if you're not hedged on the liability side, that creates a real compression in your net interest margin and as liabilities mature and need to be refinanced. So you need to really take a holistic approach to investing in this industry."

This is where match funding is so important for lessors, says McConnell. "We are not going to speculate on interest rates. We believe that is a fool's errand," he says. "We feel good about the assets we own today, long term contractual cash flows and interest rates being hedged. Inflation in this industry is real. OEMs are increasing prices; LLPs [life limited parts] in the engines are increasing by ten or 12% per year and so we do think residual values will continue to rise for the foreseeable future. But you need to take that holistic approach to understand that discount rates are also higher. Financing costs for new aircraft are also more expensive. And so at Castlelake, we look across the entire capital stack and what we are seeing today, in some situations, is unlevered asset yields pricing inside the cost of debt financing. That doesn't make a whole lot of sense."

SKY Leasing chief executive Austin Wiley believes that trading levels in the midlife and the secondary market are driven by sellers "trying to both manage their portfolio metrics for a weighted average age at lease term, and their debt maturities and profitability metrics". Wiley sees this trend continuing into 2024 with sellers trading aircraft because they need to generate liquidity, manage refinancing or their P&L, or if they are exiting the industry. "Ultimately this is creating an attractive buying opportunity for us," adds Wiley.

Consolidation is always a feature of the aircraft leasing market and in 2023 there were three significant M&A deals along with other large portfolio sales. The largest of these was Standard Chartered's sale of its aviation business.

Standard Chartered announced in January 2023 that it was searching for strategic options for its global aviation finance business, which included the sale of aircraft leasing business, its secured aviation lending portfolio and its 10% shareholding in joint investment company, SDH Wings International Leasing.

At the end of August last year, Standard Chartered announced that it had reached an agreement to sell the leasing business to AviLease, the Saudi Arabian new market entrant backed by the Public Investment Fund (PIF), the Saudi sovereign wealth fund, along with its 10% share of SDH Wings for $3.6bn, while its $900 million aviation secured debt portfolio was sold to Apollo and PK Airfinance. Both deals closed on November 2 for total sale proceeds to Standard Chartered of $4.5bn.

On the date of the official closing, Edward O'Byrne, chief executive officer of AviLease said that the day marked an important milestone for the company. "With the completion of this acquisition, we are strengthening our position in the global aircraft leasing sector, in line with our ambition to become a top-10 global lessor by 2030," he said. "Through the expanded scale and synergies, we aim to accelerate our path towards an investment-grade rating. We are pleased to welcome our new colleagues to the AviLease team."

The $3.6bn landmark deal has catapulted AviLease onto the global leasing stage only 16 months after its formation. The combined business now owns and manages 167 latest technology, fuel efficient aircraft leased to 46 airlines worldwide, with market rumours swirling that it remains interested in other leasing portfolio or platform acquisitions.

AviLease has acquired an all-narrowbody portfolio that features new technology Boeing 737 Max and A320neo aircraft as well as classic aircraft types. O'Byrne sees the older vintage of the book as a major positive for AviLease. "We have a committed aircraft portfolio of 40 aircraft – and have delivered 30 to date – all of which are brand new aircraft," he says. "Adding the maturity of the Standard Chartered book to our portfolio was a positive exercise since it improves yields and accelerates the maturity of the P&L as well as other benefits for the company in terms of technical skills inherent in managing older aircraft."

AviLease financed the acquisition with a $2.1bn bridge financing, arranged by BNP Paribas, Citibank, HSBC and MUFG, which that was syndicated to a group of ten banks: Al Ahli Bank of Kuwait, Abu Dhabi Commercial Bank, First Abu Dhabi Bank, Mizuho Bank, Natixis and Standard Chartered Bank. Allen and Overy were the legal advisors, with KPMG Ireland providing tax and accounting advice.

Apollo Global Management (Apollo) and PK Airfinance acquired Standard Chartered's portfolio of secured aviation loans, comprising 46 loans backed by 46 underlying aircraft (across 14 obligors), with 76% commercial loan and 24% JOL/JOLCO loans. The transaction has added significant scale and airline reach to Apollo's aviation finance businesses. The deal was financed with a $491 million senior secured, non-recourse facility. The facility, which has an 80% loan-to-value ratio (LTV) with an additional advance via a Class B loan, includes a drawdown and amortisation period and various step-ups in margin over time. Mizuho Americas served as lead arranger and advisor on the PK Airfinance transaction, while Redding Ridge Asset Management served as structuring agent and Milbank served as lead counsel.

In June 2023 Macquarie AirFinance UK (MAFUL) closed a $2.2 billion acquisition of 52 aircraft from the Kuwaiti lessor Alafco.

The acquisition was part of Macquarie's plan to decrease its fleet age, enhance earnings performance, and transition its capital structure to unsecured with the goal of eventually reaching investment grade ratings.

This deal was funded with a $1.65bn three-year financing facility that supported the acquisition and refinanced two newly-delivered 737 MAX aircraft. BNP Paribas, Citi, MUFG, Natixis were lead arrangers and underwriters, with 11 other banks in syndication. Lead legal advisors were Clifford Chance and Vedder Price.

In July, it was revealed that Voyager Aviation Holdings (VAH) had reached an agreement with Azorra to sell substantially all of VAH's assets and for Azorra to assume and maintain ongoing employee and business arrangements with VAH's employees and aircraft lessees. VAH entered Chapter 11 with the sale agreement with Azorra in place.

At the time VAH's executive chairman, Hooman Yazhari said that the "agreement with Azorra presents the best opportunity for our airline customers and employees".

The combined fleet melds a widebody fleet on lease with "prominent" passenger airlines with a solid fleet of regional jets and A220s.

VAH's client base includes Air France, Breeze Airways, Cebu Pacific, ITA, Philippine Airlines, Sichuan Airlines, and Turkish Airlines. Azorra currently owns and manages a fleet of

"We have a committed aircraft portfolio of 40 aircraft – and have delivered 30 to date – all of which are brand new aircraft. Adding the maturity of the Standard Chartered book to our portfolio was a positive exercise since it improves yields and accelerates the maturity of the P&L as well as other benefits for the company in terms of technical skills inherent in managing older aircraft."

Edward O'Byrne
Chief Executive Officer
of AviLease

83 aircraft on lease to 25 operators in 19 countries around the world, with total commitments of more than 140 aircraft including orders for new Airbus A220-100/300 aircraft and Embraer E190/195-E2s.

Yazhari was replaced at the helm by Robert Del Genio from FTI Consulting who took over as chief restructuring officer. VAH was advised by Milbank, Vedder Price, Greenhill & Co, and FTI Consulting.

Azorra financing the acquisition of the VAH aircraft with a $300 million limited recourse, six-year term loan, underwritten by BNP Paribas and Deutsche Bank, which acted as global coordinators and bookrunners, as well as mandated lead arrangers with MUFG.

John Evans, Azorra's CEO and founder, described the strategic financing as marking a "significant milestone in Azorra's continued growth and diversification as we respond to market opportunities", adding that by expanding Azorra's portfolio, it is "meeting the rising demand seen for widebodies as airlines rebuild their international capacity".

This was one of the more distressed transactions that closed during 2023, where Azorra – backed by Oaktree Capital Management – successfully navigated its way through the acquisition and transfer of assets and people from VAH amid a complex Chapter 11 bankruptcy process.

There were also a number of large portfolio sales during 2023. Castlelake acquired Wings Capital's assets, while DAE acquired China Aircraft Leasing Group's (CALC) orderbook.

DAE acquired the rights, interests, and obligations of a portfolio of 64 Boeing 737 MAX aircraft from a wholly-owned subsidiary of CALC, which included 737-8, 737-9 and 737-10 variants. Delivery of the aircraft is scheduled to occur between 2023 and 2026. DAE was advised by Milbank and KPMG Ireland.

On August 14, DAE announced that the company had agreed to novate the purchase agreement to DAE of 64 Boeing aircraft by transferring its interest in 12 special purpose vehicles for a payment determined by the pre-delivery payments already paid. Approximately 20% of the acquired portfolio is on lease to airline clients that are also existing clients of DAE allowing the company to expand those relationships.

At the time DAE's Tarapore said that the deal increased the percentage of new technology, fuel efficient aircraft in DAE's owned fleet to approximately 66% from 50%.

"This transaction will add certainty to our growth trajectory," said Tarapore. "This transaction will also allow us to further deepen our existing relationship with Boeing and CFM International. Since inception and including this transaction, DAE has acquired and is committed to acquire approximately 500 Boeing aircraft."

At the time, CALC declared that the novation arrangement represented a "good opportunity for the Group to adjust its Boeing fleet portfolio so as to provide flexibility to the Group's existing operations and contribute to its long-term sustainable development". CALC added that it would still "continue to consider from time to time the acquisition of further aircraft from Boeing (pursuant to any future agreements or otherwise) or other aircraft manufacturers".

DAE has made no secret of its desire to build scale in a competitive marketplace. Tarapore believes that scale is becoming even more important given the growing size of the top ten leasing companies. "Scale allows us to have more of a relationship or a solutions-based discussion with our clients, and also gives us the opportunity to have a different kind of discussion with each of our counterparties like the OEMs," he says. "There is still potential left for the top 10 lessors to grow even larger by inorganic methods, but even organically the orderbooks are all stacked in favour of top 10 lessors. Inorganic growth is also going to play a much larger role because there are still platforms that would benefit by being part of a much larger organisation where that size advantage can translate into a better financial return."

As the world's largest lessor, AerCap already realises the full benefits from its scale but from its vantage point observes

"Scale allows us to have more of a relationship or a solutions-based discussion with our clients, and also gives us the opportunity to have a different kind of discussion with each of our counterparties like the OEMs. There is still potential left for the top 10 lessors to grow even larger by inorganic methods, but even organically the orderbooks are all stacked in favour of top 10 lessors."

Firoz Tarapore
Chief Executive Officer of Dubai Aerospace Enterprise

that opportunities remain for smaller lessors to become more competitive and for larger lessors to attain that all-important investment grade rating.

"There will always be room for leasing specialists in used aircraft, engines or certain types of freighters," says AerCap's Kelly. "But those niches are becoming more and more specialised, and require a higher level of expertise... Like a lot of industries, we are moving toward larger scale businesses."

Larger scale opens the door to investment grade ratings, which is a game-changer in the world of aircraft leasing that can considerably cut costs of funding, enhancing competitiveness in a very crowded marketplace. SMBC Aviation Capital is one of the largest lessors in the world, owned by two of the largest corporations in Japan, and enjoys a BBB+/A- rating. The company acquired Goshawk in 2022 and has continued to integrate the business last year and grow organically. Peter Barrett, commented: "Being investment grade makes a difference; being able to raise funds at competitive rates makes a difference," he says. "Twenty-plus years ago, the barriers to entry were much lower in this business and getting to scale has become much harder. That will continue. In another five or ten years, there will be a much smaller number of large lessors."

For ACG's Tom Baker, scale is much more than the size of the aircraft portfolio. "Scale speaks much more to that," he says. "It speaks to a global technical and global marketing capability, with access to and understanding of different markets. Scale is really the quality of a global platform to be able to support that kind of complexity and sophistication."

Investment grade rated lessors are all large scale entities relative to the rest of the market, which is essential for accessing the debt capital markets to raise large amounts of capital and for exercising influence with suppliers: "If you're going to go out and raise benchmark bond issuances of half a billion dollars and above, then you need scale," says Robert Martin. "You can't do that if you're a $2bn to $3bn lessor. Scale is also required to be relevant to the two biggest stakeholders, Airbus and Boeing. Then you also need to operate in scale to be able to take a significant number of deliveries directly from the manufacturers, but also be able to support them in other ways using either sale leasebacks or all financed lease product or even our engine finance lease product."

The size of the top five aircraft lessors has grown exponentially over the past decade as the industry has matured. With AerCap ahead of the pack with an estimated portfolio value of $40bn-plus, the top tier lessors all control between $10bn to $20bn in assets. Reaching such a scale by organic methods is difficult, which leads new entrants or smaller lessors seeking to enhance market share seeking to grow via acquisitions of larger portfolios or other platforms.

As demonstrated by its recent acquisition of Standard Chartered's leasing business and rumours swirling that the Saudi company is targeting another large lessor, AviLease is forging a market share via in organic growth and is also pursuing that investment grade rating once it reaches a certain age and size. Other companies, with strong backers, are following a different path.

"The rating agencies have made is clear than to reach investment grade you need the right scale and the right age," says Griffin's McKenna. "We have crossed the four year mark and are looking to reach that goal step by step." McKenna stresses that Griffin did not set out to build specific scale, "we set out to make thoughtful investments and the team has grown organically, which will continue to evolve over time".

S&P's Snyder says that the rating agency has "always thought of scale as important, even in a low interest rate environment, and that hasn't changed". She also notes that the agency also does not have a specific size that would constitute the right scale for an investment grade rating: "It's hard to say because it could be $6bn but what if that portfolio is all widebody aircraft? We look at the composition of the fleet and the average age, for example. The portfolio size in terms of dollars is not what we focus on. We also look at the level of unencumbered assets in

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Robert Martin
Former Chief Executive Officer
of BOC Aviation

the portfolio, which is very important. The whole rating agency community typically requires no more than 30% of [a lessor's] assets encumbered. Many of the non-investment grade lessors still have a lot of secured debt in their capital structures."

A good example of a company reassessing the mix of portfolio to secure an investment grade rating is Macquarie's acquisition of Alafco.

Another determining factor for lessors chasing investment grade is the ownership of the company. Investment grade lessors today are characterised by either a strong parent in the case of SMBC Aviation Capital and ACG, or they are public like AerCap and Air Lease Corporation.

In the higher-for-longer interest rate environment, access to cheaper funds will be essential for leasing companies going forward as they refinance existing debts or seek to raise new capital to fund growth.

Snyder observes that given the amount of M&A activity in the leasing sector over the past few years, the only targets remaining are more medium-sized portfolios that would not require a large-scale investment unless, she says, some more bank portfolios come up for sale. There are a number of bank portfolios up for sale – Helaba and KFW are seeking an exit from the space – which could be a tempting acquisition for smaller lessors if they can access funding at the right price.

Mizuho's Srinivasan agrees that the majority of large lessor M&A activity has already happened, with new start-ups now competing for scale. "The question is whether they can get to a point where they are sustainable," he says. "Many have capital behind them to allow them to grow and there will be some further consolidation because of the interest rate environment. There is going to be a squeeze, and some of the equity backers will exit the market at some point." He adds that the geopolitical situation could cause "more seismic acquisitions" but most likely that consolidation will remain among the smaller players.

Investor appetite has remained strong for the leasing sector but the type of investors has ebbed and flowed with the macroeconomic environment. Over the past year, as previously mentioned, there have been a number of commercial banks seeking to exit the market, which some say could continue given the constraints European banks are operating under in regards to both balance sheet limits and ESG policies. The good news for the sector is any lost capital is being replaced rapidly by new entrants to the space.

"It is striking that we keep seeing new equity coming into the sector," says MUFG's Trauchessec. "We see sovereign wealth funds, private asset managers, all setting up new entrant lessors. This means that the market will continue to be fragmented and there will be some consolidation but more in specific situations where lessors have taken on too much leverage or haven't been able to grow enough."

Aircraft leasing demonstrated its resilience throughout the pandemic and even when many assets were trapped in Russian following sanctions imposed after the invasion of Ukraine. Although the write-downs booked in 2022 for the trapped Russian aircraft did little to deter investors at the time, the fact that many leasing companies are now beginning to receive payouts from their insurance companies is another demonstration of the long-term resilience of the sector.

Aircraft leasing is a long-term business and one that is constantly looking many years ahead to be able to predict demand for airplanes and to ensure the industry will remain sustainable in the years to come. The emphasis on sustainability, but also more about the social and governance aspects of the sector, has continued throughout the past year as lessors increasingly realise the need to embrace ESG concepts to future-proof their businesses.

Although airlines are the prime source of carbon emissions, sustainability and broader ESG challenges remain front and centre issues for aircraft lessors. Many of the larger lessors are already committed to investing in the most fuel-efficient new technology aircraft and engines, but many are also investing in additional programmes and products to further aviation's decarbonisation journey. "The lessor community has done a nice job rallying recourses around ESG initiatives and have internalised a commitment to driving changes," observes ACG's Tom Baker.

"It is striking that we keep seeing new equity coming into the sector. We see sovereign wealth funds, private asset managers, all setting up new entrant lessors. This means that the market will continue to be fragmented and there will be some consolidation but more in specific situations where lessors have taken on too much leverage or haven't been able to grow enough. "

Olivier Trauchessec
Head of Global Aviation of MUFG Bank

SMBC Aviation Capital has put a lot of work and thought into its ESG programme, initiating investments in carbon credits, SAF and work around improving diversity and inclusion in the industry. "We are very focused on all three letters of ESG [environment, social and governance]," says Barrett. "We create financings, structures and incentives that are all focused on ESG, be it the carbon intensity of our fleet or around gender diversity in our business."

SMBC Aviation Capital – and the entire aircraft leasing community – has been a prolific supporter for the adoption of sustainable aviation fuel (SAF). "SAF is the pathway that can make the most difference as an industry," says Barrett. However, as explained in detail over recent years, SAF production is constrained and nowhere near the levels the airline industry needs on an annual basis, which also makes SAF prohibitively expensive for most airlines.

Many lessors are investing in joint venture agreements to invest in SAF production. Aircraft Leasing Ireland's (ALI) Aircraft Leasing Ireland (ALI) announced the funding of a new four-year research project on SAF production during the association's second Global Aviation Sustainability Day Conference at the Convention Centre Dublin in November. The study was created to investigate potential avenues for manufacturing SAF in Ireland.

Air Lease Corporation set up a joint venture agreement with Airbus in 2021 that has a dedicated funding level for sustainability, including providing SAF for its aircraft deliveries.

Willis Lease Finance has gone one step further and directly invested in a power-to-liquid (PtL) SAF production facility in the UK, which forms part of the company's broader strategy to contribute towards the decarbonisation of aviation. Chief executive Austin Willis shares the thinking behind the investment: "We believe PtL is more scalable, and by investing in it, we can help deliver meaningful volumes of SAF in the years to come."

One of the determining factors for Willis Lease's investment in the plant was the funding provided by the UK government, which Willis says made it clear that the UK "wants to be a leader in the production of SAF and PtL" and which "shares our vision that it's going to be a very important component to the delivery of SAF in the future".

Switching to the S in ESG. Helicopter leasing company, LCI has created the first social loan framework for the aviation industry. LCI is a signatory of ALI's Sustainability Charter and has a commitment to driving forward and achieving ESG related goals. LCI and Sumitomo Mitsui Finance and Leasing (SMFL) have developed the world's first social loan framework for helicopter leasing, finance and operations.

LCI with SMFL have their own ESG programmes that reflects SMFL's long term commitment to the UN's Sustainable Development Goals as part of the company policy 'The SMFL Way'.

The framework, which has been established initially for LCI's joint venture leasing operation with SMFL, has been developed in accordance with the internationally agreed Social Loan Principles developed in 2023 by the Loan Syndications and Trading Association (LSTA). The LTSA Social Loan Principles require any funds to be used for eligible and verified Social Projects, which in LCI's case will include search and rescue (SAR) and emergency medical services (EMS).

LCI and SMFL, led by Alan O'Rourke, chief financial officer of LCI, have been working on this framework since the beginning of the 2023 and have liaised closely with the LTSA as well as the Japan Credit Rating Agency. "We wanted to design the framework to be as internationally focused as possible, which is why we based it on the LTSA Social Loan Principles, but given our relationship with Japanese investors via the SMFL joint venture, we also worked very closely with the Japan Credit Rating Agency to explain what roles the assets play and how they fit into the social principles."

LCI and SMFL's Social Loan Framework has received the highest rating of "Social 1(F)" from the Japan Credit Rating Agency. Social finance products specifically raise funds for projects or assets that are utilised for positive social outcomes. Helicopters financed by LCI and SMFL will be exclusively used for search and rescue and emergency medical services, providing affordable essential services.

The ESG focus will continue to be foremost within all aviation sectors as the industry is pressured to delivered on its targets to decarbonise in line with net zero agreements. "ESG policies and strategies are critical for lessors," says NAC's Liu. "Lessors need to ensure they have the most fuel-efficient fleets and also have a long-term understanding of the developing technological shifts from a residual value standpoint. Because we're in the residual management business, the fleet and the technology shifts directly to the lessors. We also need to understand the whole SAF situation, because we have to be very realistic about the issues with supply availability, refinery capacity and cost."

Chapter Four

OEM and Fleet Focus

The title of this report, Demand and Disruption, is a fitting description for the current state of aircraft manufacturing. As evidenced in the opening chapter of this publication, air travel demand has returned, and more rapidly than predicted, with airlines clamouring for lift as production issues translate into constant delivery delays. Airlines have also embarked on refleeting programmes to phase out older aircraft and upgrade to new technology, more fuel efficient equipment in order to meet their sustainability targets, which has enhanced the aircraft order cycle over the past year.

Airbus ended 2023 with orders for 735 commercial aircraft – an 11% increase over 2022. Airbus chief executive Guillaume Faury called 2023 a "landmark year" for Airbus' Commercial Aircraft business, with sales and deliveries at the "upper end of our target". Faury credited a number of factors for the increase including "increased flexibility and capability of our global industrial system, as well as the strong demand from airlines to refresh their fleets with our most modern and fuel-efficient aircraft".

Faury further noted that the European manufacturer had anticipated aviation to recover in the 2023-2025 timeframe but 2023 showed the return in demand for both single-aisle and widebody return "much sooner than expected, and with vigour". He added: "We have never sold as many A320s or A350s in any given year, not to mention welcoming seven new customers for the A350-1000. Travel is back and there is serious momentum!"

Despite the dearth of some 3,000 aircraft that were not produced during the pandemic period, the OEMs are still struggling to deliver their backlog of airframes and engines, plagued by continuing supply chain and manufacturing issues as the industry struggles to restart after the pandemic. Some two years following the resumption of air travel, the manufacturing sector has yet to return to full force due to ongoing shortages of skilled labour, resources, raw materials and inflationary costs coupled with a tense geopolitical environment that is increasingly impacting trade routes exacerbating an already fraught situation.

FIG. 17: OEM ORDERS & DELIVERIES 2023

Aircraft Type	Orders	Deliveries
Airbus A220 Family	141	68
Airbus A320 Family	1,675	571
Airbus A330 Family	-3	32
Airbus A350 Family	281	64
AIRBUS TOTAL	**2,094**	**735**
Boeing 737 Family	987	396
Boeing 767 Family	30	32
Boeing 787 Family	313	73
Boeing 777 Family	126	26
BOEING TOTAL	**1,456**	**527**

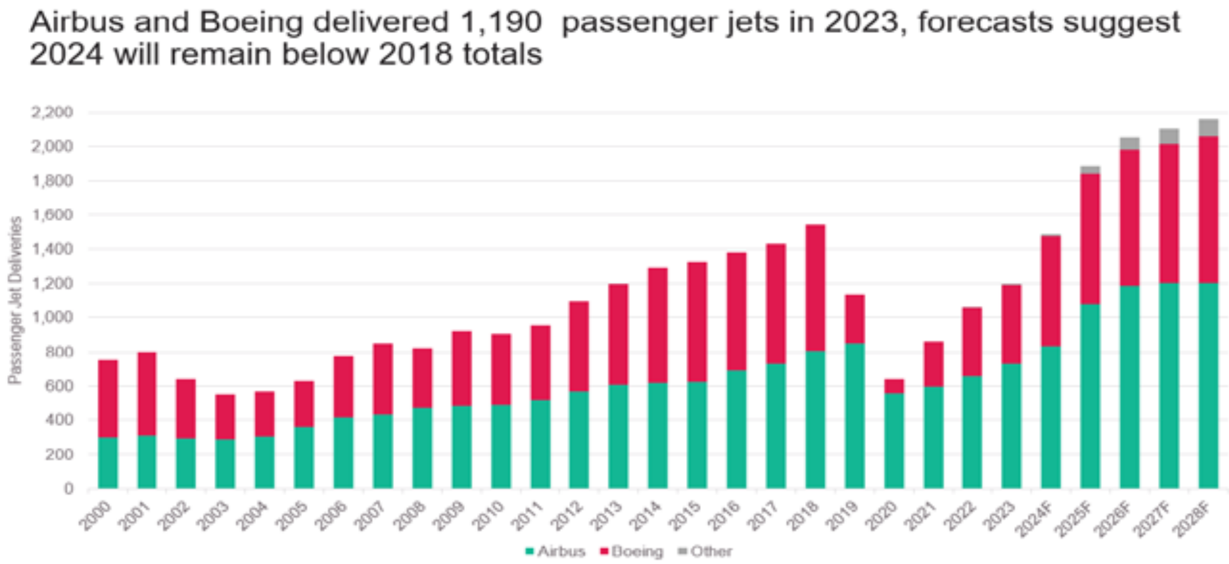
Paul Meijers, executive vice president - commercial transactions at Airbus, says that after a "very challenging period" in 2022 with suppliers saw some stabilising in 2023 that reflected in Airbus meeting its delivery objectives last year with 735 aircraft. "Airbus is monitoring its supplier base more deeply to anticipate problems but a number of concerns persists, including with BFE suppliers, shortages of spare engines and logistical issues," he says.

A proliferation of entry-into-service (EIS) issues with new equipment, predominately engines but also airframe manufacturing issues, especially with the 737 MAX, has plagued the industry in recent years.

Airframe manufacturer Spirit AeroSystems – which constructs fuselages for Boeing MAX aircraft and the Airbus A220 – has dealt with a number of so-called "quality escapes" over the past year that have resulted in a number of manufacturing problems.

In April 2023, Boeing identified a manufacturing issue with the MAX's vertical stabiliser fittings caused by a subcontractor to Spirit AeroSystems. The repairs were quickly addressed but caused delays to deliveries during the summer season. Then in August 2023, Boeing disclosed a manufacturing defect in its 737 MAX aft pressure bulkhead caused by incorrectly drilled holes by supplier Spirit AeroSystems.

> **"We have never sold as many A320s or A350s in any given year, not to mention welcoming seven new customers for the A350-1000. Travel is back and there is serious momentum! "**
>
> *Guillaume Faury*
> *Chief Executive of Airbus*



Source: Cirium

FIG.18 PASSENGER AIRCRAFT DELIVERIES

Spirit AeroSystems confirmed that its 737 fuselages, shipped from its Wichita facility, had been affected by a problem involving elongated fastener holes on the aft pressure bulkhead but noted that only certain units were affected. Spirit AeroSystems inspected its inventory of 60 aircraft relatively quickly, despite having to extend inspections to a greater section of aircraft. Boeing had 250 completed aircraft to inspect that was targeted for completion by the end of November. The company implemented changes to its manufacturing process and resumed delivery of MAX 8 fuselage units to Boeing by the end of October.

Boeing's 787 was also hit by production delays when a flaw was discovered in June 2023 to its fitting for the aircraft's horizontal stabiliser.

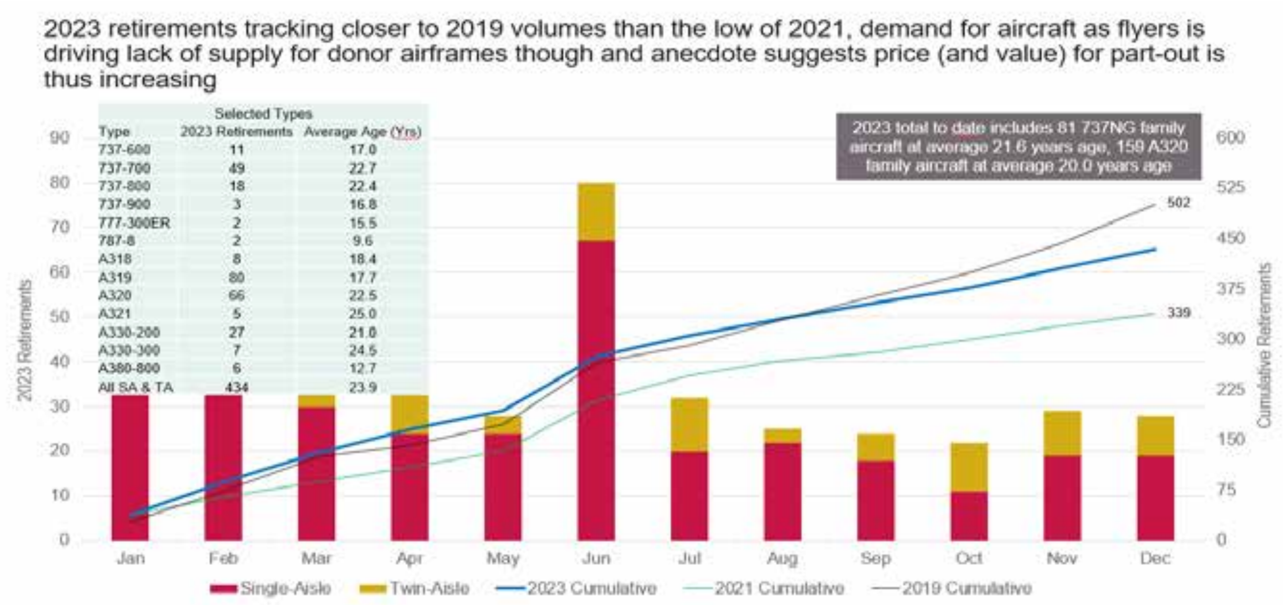
At the end of 2023, the Federal Aviation Administration (FAA) disclosed it was closely monitoring possible loose bolts in the 737 MAX rudder control system. Boeing had issued a multi-operator message urging operators of "newer single-aisle aircraft" to "inspect specific tie rods that control rudder movement for possible loose hardware". Boeing recommended the action after an international operator discovered a bolt with a missing nut while performing routine maintenance on a mechanism in the rudder-control linkage. The company discovered an additional undelivered aircraft with a nut that was not properly tightened.

On an earnings call on November 1, 2023, Patrick Shanahan, president and chief executive of Spirit AeroSystems, said that his mindset was that the company can "eliminate all defects" and that it has a "very robust quality management system" but it requires time and attention and that there was "no silver bullet or different procedure" that it could implement since it required the focus of the entire organisation on manufacturing excellence.

Boeing and Spirit AeroSystems woes continued into the new year. On January 5, 2024, a suspected manufacturing issue may also have led to the mid-air depressurisation of an Alaska Airlines 737 MAX 9 aircraft shortly after take-off when a door plug blew out in mid-air. Flight 1282, carrying 171 passengers and six crew, was forced to make an emergency landing and returned safety to Portland International Airport with no injuries.

The FAA took the decision to ground the aircraft type following the incident and issued an emergency airworthiness directive (EAD) requiring all MAX 9 operators to inspect aircraft before further flight. Data from Cirium shows there are 215 737MAX 9s in service. As

> **"Safety is our top priority and we deeply regret the impact this event has had on our customers and their passengers. We agree with and fully support the FAA's decision to require immediate inspections of 737-9 airplanes with the same configuration as the affected airplane. In addition, a Boeing technical team is supporting the NTSB's investigation into last night's event. We will remain in close contact with our regulator and customers."**
>
> *Boeing*



Source: Cirium

FIG. 19: PASSENGER AIRCRAFT RETIREMENTS 2023

well as 65 aircraft in service with Alaska, other major operators are United with 79 of the aircraft in service, and Copa with 29 in service.

Boeing said in a statement: "Safety is our top priority and we deeply regret the impact this event has had on our customers and their passengers. We agree with and fully support the FAA's decision to require immediate inspections of 737-9 airplanes with the same configuration as the affected airplane. In addition, a Boeing technical team is supporting the NTSB's investigation into last night's event. We will remain in close contact with our regulator and customers."

Alaska Air immediately grounded its MAX 9 fleet to begin inspections and later reported its engineers had discovered "loose hardware", while United Airlines also referred to "installation issues relating to the door plug" upon inspection of its aircraft.

Initial National Transportation Safety Board (NTSB) investigations indicated that "all 12 stops [on the door plug] became disengaged, allowing it to blow out of the fuselage". It is also unclear whether the "four bolts that restrain it from its vertical movement" were fitted there, something a closer inspection of the door plug in the NTSB's Washington laboratory will seek to ascertain.

Boeing president and CEO David Calhoun defined the issues as concerning a "discrete set of airplanes with a very discrete plug," highlighting that despite having a "proven design," a "quality escape occurred".

The FAA has announced what it terms 'new and significant actions to immediately increase its oversight of Boeing production and manufacturing'. This comes a day after the FAA formally notified the aircraft manufacturer of an investigation into its 'alleged noncompliance' regarding 737-9 MAX component issues.

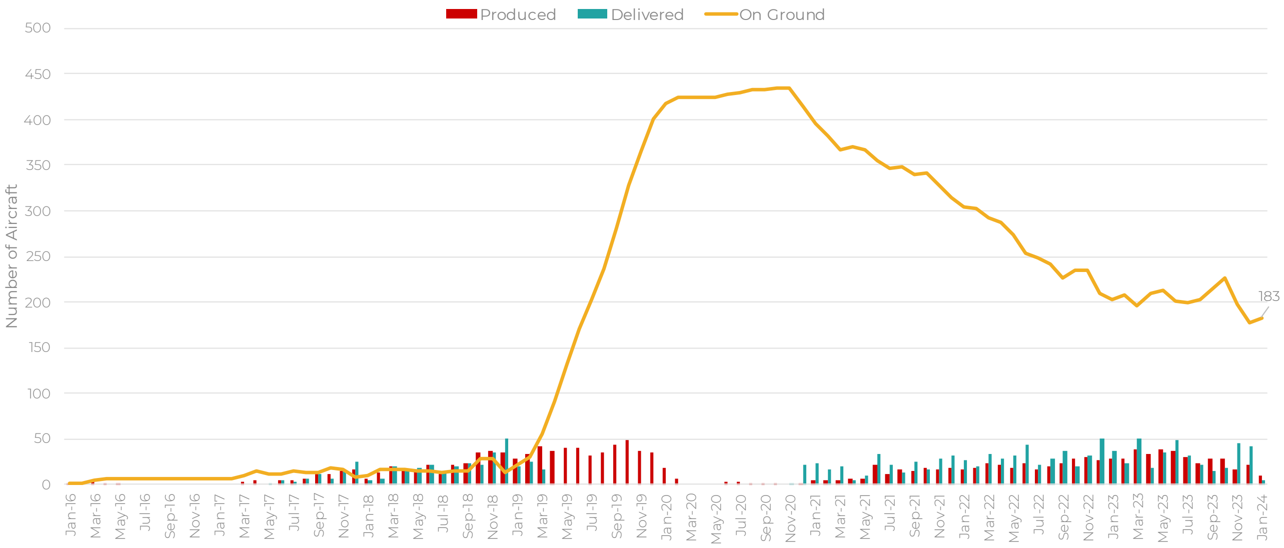
As part of these actions, the FAA will conduct an independent third-party audit of the 737-9 MAX production line and its suppliers 'to evaluate Boeing's compliance with its approved quality procedures'. The results of this audit analysis will determine whether additional audits are necessary.

"It is time to re-examine the delegation of authority and assess any associated safety risks," said FAA administrator Mike Whitaker, adding that "the grounding of the 737-9 and the multiple production-related issues identified in recent years require [the FAA] to look at every option to reduce risk".

As well as assessing safety risks around delegated authority and quality oversight, with examination of options to move these functions under independent third-party entities, the FAA will also implement increased monitoring of 737-9 MAX in-service events.

The investigation is ongoing at the time of publication but the MAX 9 incident seems like a culmination of manufacturing issues for the Boeing MAX product. Boeing has been working hard over the past few years with its suppliers to smooth out supply chain issues and shore up its production process. There were signs that the manufacturer was on a better trajectory into 2024 before the Alaska Airlines incident, which will only serve to delay production further. Boeing had intended to move closer to its goal of producing 50 aircraft each month by 2025 to 2026 but that target may have moved once more as the team focus on manufacturing quality and safety.

Airbus has not had such severe manufacturing issues but it too has been impacted by supply chain delays and certain of its A320neo aircraft have been grounded due to the reliability issues with the Pratt & Whitney GTF engine. Problems with the engine have been rumbling along for several years, with a steady uptick in AOGs in 2022, but the scale of the problem was revealed



Source: AviationValues

FIG. 20: 737 MAX PRODUCTION AND DELIVERY RATES

in September 2023 during an investor call from P&W parent company RTX, which confirmed that 600 to 700 incremental geared turbofan engines would have to be removed from aircraft for quality checks between 2023 through to 2026.

The engines are being inspected due to a manufacturing issue with the powder metal coating on high pressure turbine (HPT) discs and high-pressure compressor (HPC) discs. A contaminant was discovered in the powdered metal used on certain components in 2020 that could result in cracks being formed during manufacturing. A subsequent investigation into a compressor disc failure in 2022 and further ongoing testing led to larger cracks being discovered. RTX announced its intention in July 2023 to accelerate approximately 1,200 PW1100 shop visits to inspect the parts. In the September announcement, RTX announced incremental checks for 600 to 700 engines and confirmed that any affected discs would be replaced with new discs with full certified life thus eliminating the need for repetitive inspections and a longer time on wing.

Pratt & Whitney's fleet management plan for the affected PW1100 GTF engines requires a combination of a repetitive inspection protocol, at an interval of between approximately 2,800 and 3,800 cycles, and part life limits of between approximately 5,000 and 7,000 cycles, for HPT discs and HPC discs.

The gross financial impact of the fleet inspection and management plan, which includes customer support as well as the accelerated workscope, is forecast to be $6bn to $7bn, with a net operating profit impact of $3bn to $3.5bn. The cost to Pratt & Whitney for its 51% net share of the PW1100 programme is a pre-tax operating profit charge of approximately $3bn.

These figures are based on estimates of potential compensation and other consideration for customer fleet disruption and the one-time Estimate-at-Completion (EAC) impact of estimated incremental costs to long-term maintenance contracts as a result. The incremental costs to the company's long-term maintenance contracts include the cost of additional inspections, replacement of parts and other related impacts.

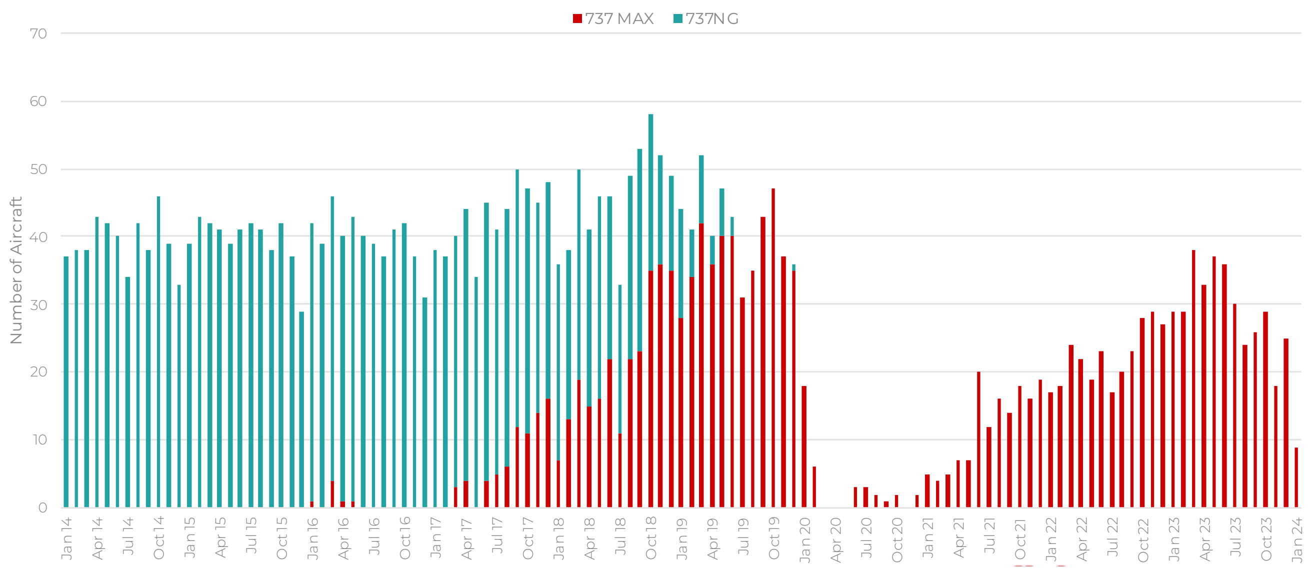
Pratt & Whitney has confirmed that the majority of the estimated costs of the fleet inspection and management plan (some 80%) would be on the customer support requirements, with the remainder on the workscope mainly on materials and labour costs.

The impact of the fleet inspection and management plan will be significant for GTF operators, especially those with larger fleets.

The majority of the GTF PW1100 engines have been removed for shop visits in the fourth quarter of 2023 and into early 2024. The workscope for these shop visits is heavy in nature since they incorporate the inspection and replacement of the compressor and turbine discs on the engines.

President and chief operating officer at RTX, Christopher Calio, confirmed on an earnings call at the end of October 2023 that the plan outlined in September was proceeding. He also noted that the first engine removals had occurred with several proceeding to project visit workscopes that had an average turnaround time of 35 days, which Calio described as "encouraging" although this is only a shorter step in the overall shop visit required for each engine.

RTX estimated that each workscope will take between 250 and 300 days from when the engines are removed from the wing until they are returned to the operator (wing-to-wing). As a result, RTX forecasts an average of 350 aircraft on ground rate for the GTF-powered A320 fleet from 2024 to 2026 – with a peak of 600-650 aircraft on ground during the first half of 2024.



Source: AviationValues

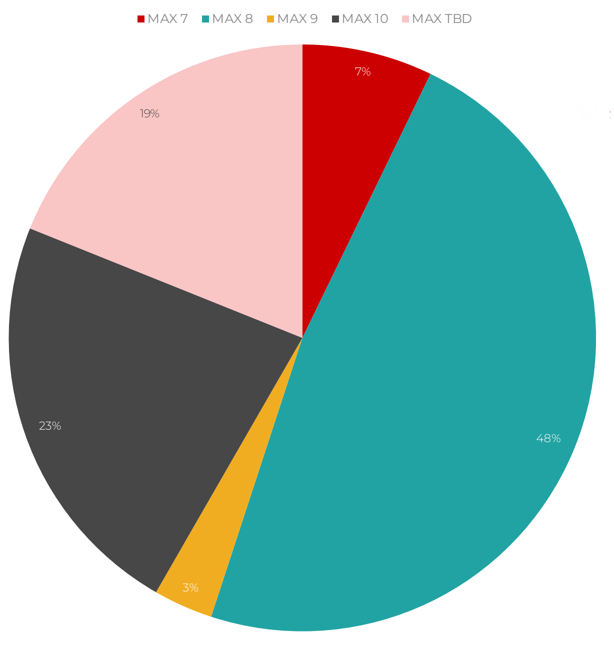
FIG. 21: 737NG AND 737 MAX MONTHLY PRODUCTION SINCE 2014

The accelerated removals and incremental shop visits will result in higher aircraft on ground as well as add to an already strained MRO capacity.

Pratt & Whitney has also completed the analysis of the impact of powder metal on other engine models within its fleet. Calio further confirmed that P&W would institute a fleet management plan for the PW1500 and PW1900 engines that power the A220 and Embraer E2 aircraft that would "largely fit inside the shop visit plans that are already in place for these fleets". Part of this please includes shortening the expected life of certain parts for the PW1500 and PW1900 engines, which will cause "some incremental AOGs" of Airbus A220s and Embraer E2 aircraft "in the first half of 2024".

RTX has had a fleet management plan in place for the V2500 since 2021 which Calio said would be augmented by accelerating certain inspections but says it would have "little impact operationally or financially".

A key sticking point in RTX's fleet management plans for the GTF engines is maintenance capacity. Post-pandemic the MRO sector has already been stretched to capacity as demand picks up, while the MRO shops are experiencing the same challenges as the rest of the industry with staff shortages,



Source: AviationValues

FIG. 22: 737 MAX BACKLOG

increased costs and a shortage of parts.

The GTF inspection process will include a heavy workscope replacing life limited parts, which extends the shop time. P&W is predicting between 250 and 300 day turnaround time per engine but there are some that put a question mark around that estimate.

Aircraft and engine lessors are witnessing the impact first had. The engine leasing sector is divided into long-term spare engine leases – around 10-12 year leases – or shorter term lease used to cover short-term requirements such as MRO shop visits. Currently, we're seeing a significant shift in demand patterns due to the labour shortage in the MRO sector and a scarcity of parts, which has led to extended shop visit durations. "Previously, a full

Assessing the impact of the GTF issue

Gary Crichlow, Head of Commerical Analysts at Aviation Values, comments on the impact of the GTF issues on A320-family operators

The issues of durability, and hence operational reliability, of new technology engines have been well publicised and is thought to affect close to the entire fleet of aircraft they power.

The table to the right presents a snapshot of the A320neo fleet's status, by operator, as at January 15, 2024. The data is sourced from AviationValues' Activity module, which uses a minute by minute global feed of Automatic Dependent Surveillance Broadcast (ADS-B) signals to determine whether each aircraft is in active service, temporarily parked or in longer term storage.

There are any number of reasons that an aircraft can be withdrawn from service: for example, Go First's 100% storage rate is clearly due to that carrier's collapse. However, the company noted as a significant proximate cause the engine reliability and availability of MRO support in India for its Pratt & Whitney powered fleet. It's worth noting that the issue of reliability had been contentious between the two companies from 2017 due to early problems with the fan blades, oil seals and combustor lining.

Pratt & Whitney's Geared Turbofan family has endured the most public scrutiny of the new technology engine models. Further details can be obtained from FAA/EASA Airworthiness Directives, but the most recent Pratt & Whitney PW1100G contaminated metal powder issues with Life Limited Parts relate to:

- High Pressure Turbine Stage 1 & 2 Hubs
- High Pressure Compressor Integrated Bladed Rotor 7, and 8, as well as the Aft Hub
- In December 2023 the FAA proposed a requirement for accelerated replacement of the above components, plus:
- High Pressure Turbine Stage 1 air seal, Stage 1 & 2 blade retaining plates and Stage 2 rear seal.

Ultimately, it's a durability problem: Life Limited Part (LLP) limits have been reduced, and our understanding is that this procedure is here for the foreseeable future. The ramifications are significant, with reports of hundreds of engines being inducted for inspection programme shop visits through at least 2026.

CFM have also had issues with the LEAP-1A engine although 2023 has seen several announcements that will rectify issues such as Fuel Nozzle coking, and HPT Blade and Nozzle durability in harsher environments. It is thought that enhancements will be present in the fleet during 2024.

Despite these issues, the strength of the underlying demand has meant that market values for A320neos have continued to increase. On a fixed age basis, Market Values have increased by between 1.8% and 3.5% depending on age over the past 12 months. Transaction activity for new technology engine aircraft on the second hand market continues, notably A320neo family sale and leasebacks by Lufthansa Group and Spirit Airlines in the last month.

The impact has been even more pronounced in aircraft powered by classic technology engines: AviationValues has tracked significant upward pressure on lease rentals for the A320ceo. Some recent market lease rate indicators include:

- 2004 build (20 year old) A320-200 with an extension lease rental of USD 120k, an increase of c.10% in 12 months.
- 2009 (15 year old) build with a lease rental of USD 170k per calendar month, an increase of c.22% in 12 months.
- 2014 (10 year old) build lease rental of USD 230k per calendar month, an increase of c.25% in 12 months.
- Market Values for A320ceo aircraft have also increased in the last 12 months:
- 20 year old fixed age A320-200 Market Values have increased 6.8% in the 12 months to 15 January 2024.
- 10 year old fixed age A320-200 Market Values have increased 4.6% in the 12 months to 30 October 2023.
- 5 year old fixed age A320-200 Market Values have increased 3.5% in the 12 months to 30 October 2023.

Given the timeframe over which new technology engine issues, particularly for Pratt & Whitney, are anticipated to be resolved, the expectation is that relatively high storage rates for the A320neo will persist for some time yet. Whether this leads to a moderation in lease rates and acquisition costs remains to be seen, as demand appears to yet show no sign of abating. The clear beneficiary, both in terms of observed lease rates and values, is aircraft powered by classic technology engines, and this appears to be the norm for the foreseeable future.

FIG. 23: A320-FAMILY OPERATORS (SORTED BY LARGEST PW1100 ENGINE OWNERS)

Operator	Active		Parked		Stored		Total Installed Engine Fleet	Percentage of Current fleet Stored or Parked
	LEAP-1A	PW1100G	LEAP-1A	PW1100G	LEAP-1A	PW1100G		
IndiGo Airlines (India)	278	176		4		98	556	18%
Spirit Airlines		160		2		20	182	12%
Volaris		108		2		32	142	24%
Wizz Air Malta		100				18	118	15%
Sichuan Airlines		100		2		6	108	7%
Delta Air Lines		96					96	0%
Air China	64	88				12	164	7%
VivaAerobus		82		2		12	96	15%
Lufthansa		76		2		18	96	21%
Wizz Air Hungary		62		6		4	72	14%
Turkish Airlines		60				24	84	29%
Juneyao Air	2	58					60	0%
Shenzhen Airlines	2	56		2		4	64	9%
jetBlue Airways		52		4		4	60	13%
Frontier Airlines	164	50					214	0%
Cebu Pacific Air		50		2		6	58	14%
China Southern Airlines	168	48				2	218	1%
LATAM Airlines Brasil		48				2	50	4%
VietJet Air		48					48	0%
Aegean Airlines	2	46				8	56	14%
Qingdao Airlines		44				2	46	4%
All Nippon Airways		42		8		16	66	36%
Vueling Airlines		40		4		14	58	31%
Air Astana		40					40	0%
Vietnam Airlines		38				2	40	5%
JetSMART		36				4	40	10%
ITA Airways		32					32	0%
Hawaiian Airlines		30				6	36	17%
Scoot		30					30	0%
China Express Airlines		28		2			30	7%
Air New Zealand		26				8	34	24%
Wizz Air UK		26				2	28	7%
Anadolujet		24				22	46	48%
Air Transat		24				6	30	20%
Tianjin Airlines	4	24					28	0%
China Airlines		20					20	0%
Korean Air		18					18	0%
HK Express	8	16				4	28	14%
Swiss International Airlines		14		2		4	20	30%
Air Macau		12		2		2	16	25%
FlyArystan		12				4	16	25%
Tigerair Taiwan		12					12	0%
Middle East Airlines		10				8	18	44%
Philippine Airlines		10				6	16	38%
LATAM Airlines Chile		10				2	12	17%
West Air China		10				2	12	17%
Wizz Air Abu Dhabi		10		2			12	17%
Iberia Express	14	8				2	24	8%
Lufthansa CityLine		8					8	0%
United Airlines		8					8	0%
Austrian Airlines		6		4			10	40%
Volaris Costa Rica		6					6	0%
Volaris El Salvador		6					6	0%
Azerbaijan Airlines		4				2	6	33%
HiSky Europe		4					4	0%
Marabu Airlines		4					4	0%
Nordica		4					4	0%
Pegasus Airlines	170	2	2				174	1%
Gulf Air	34	2					36	0%
EgyptAir	28	2					30	0%
Jetstar Airways	20	2					22	0%
Tunisair	8	2					10	0%
Aircalin	2	2					4	0%
JetSMART Peru		2					2	0%

Source: AviationValues

refurbishment might take between 90 to 120 days, but now we're looking at more than 180 days," says Bobby Janagan, managing director of Rolls-Royce Partners Finance (RRPF). "This change has naturally increased the demand for short-term engine leases, with customers now seeking spare engines for longer durations to accommodate these extended MRO turnaround times. The MRO shops are filled with engines awaiting parts, effectively blocking capacity. The MRO and supply chain are diligently working to optimise capacity and source parts as quickly as possible, and increasingly target used parts, yet the demand for parts continues to outpace supply."

Greg Conlon, chief executive of High Ridge Aviation, said that finding engine MRO slot availability was difficult and taking much longer to complete. "Typically pre-Covid, it took 45 days to get any engine through a shop visit prior to the GTF issues. Now we are getting quotes from 210 to 270 days to shop an engine."

RTX said in October that it has made progress with increasing MRO capacity by accelerating investments in its GTF network, with capacity added to Singapore facility and Iberia Maintenance joining the aftermarket network at the end of 2023. The network at full force will have 16 sites around the world, with plans for a further three shops to come online by 2025. P&W says it will be able to conduct more than 2,000 annual shop visits in 2025 – a fivefold increase over 2019.

MRO capacity is at a premium but industry experts are agreed that the lack of parts and constraints in parts production is a significant variable in P&W's published fleet management plan.

"Parts are a big problem for Pratt," says one expert. "Those parts cannot be repaired so need to be produced. Pratt will need to double the production of its discs and they are already behind in ramping up after the pandemic."

Not every part in the affected engines will be rejected – maybe one part for every ten inspections, says one lessor, who adds that to put in place the extra production and MRO capacity, the industry will need to "work harder and faster, smarter to get this done quickly because the MRO capacity is pretty tight".

RTX has promised to replace as many HPT and HPC discs as possible with full life discs during shop visits to maximise time on wing. There have been doubts around whether the company can produce the increase quantities of discs in a shortened timeframe but Calio said in October that the company was accelerating its baseline forecast for run rate capacity disc production.

RTX chief executive Gregory Hayes said in October that he believes the company has its "arms around the operational and financial impacts of the powdered metal issue" and is now focused on executing those fleet management plans.

Regarding the recent challenges with new equipment, RRPF's Janagan notes: "Issues at Entry into Service (EIS) with new equipment are somewhat anticipated in our industry," he says. "However, the magnitude of the GTF issue is really unfortunate for our airline customers. That said, Pratt & Whitney has identified a solution and is working in close collaboration with customers to rectify the situation. To Pratt's credit, they have been very cooperative, providing essential information to all key stakeholders. However, the plan to rectify the situation, while necessary, will inevitably lead to further supply constraints. As a result, we're seeing strong demand for previous generation engines and an extension in the useful lives of older engines as the market adapts."

RRPF's Janagan expects the OEMs and MRO shops to work through the parts shortage by late 2024 and into 2025 as the manufacturing sector resolves shortages of resources and supply.

GTF CUSTOMERS RESPOND

Spirit Airlines is the largest operator of GTF-powered A320neo-family aircraft, with the highest number of engines produced during that affected period between 2015 and 2021. Chief executive Ted Christie updated investors on how the issue was impacting the airline on an third quarter earnings call at the end

"Previously, a full refurbishment might take between 90 to 120 days, but now we're looking at more than 180 days. This change has naturally increased the demand for short-term engine leases, with customers now seeking spare engines for longer durations to accommodate these extended MRO turnaround times."

Bobby Janagan
Chief Executive Officer of Rolls-Royce Partners Finance

CFM56 engines "bogus parts" investigation

The importance of engines parts was thrown into sharp relief this summer when it was revealed than a parts supplier had been providing engine parts with falsified certification documents for CFM56 engines.

On July 28, all CFM56 MRO providers received a notice from CFM International informing them about certain falsified documents had been identified for certain CFM56 engine component parts.

CFM noted that it had been contacted by an MRO provider regarding the authenticity of an EASA Form 1 document allegedly issued by Safran Aircraft Engines for a new CFM56 part. The MRO provider had received the document from AOG Technics Ltd. Following an immediate investigation, CFM confirmed that the EASA Form 1 in question "was not issued by Safran Aircraft Engines".

The letter shares that further EASA Form 1 documents provided to the MRO provider covering multiple CFM part numbers offer for sale were found to have "significant discrepancies" including EASA Form 1 documents attributed to Safran Aircraft Engines that were not issued by the company, as well as a memo of shipment documents that were also not issued by Safran.

As a result of these findings, Safran filed a Suspected Unapproved Parts (SUP) notification with EASA that identifies 29 EASA Form 1 documents that were raised for 22 separate CFM56 component part numbers.

The CFM letter also revealed further findings of a "FAA Form 8130-3 document received by an MRO provider from AOG Technics LTD attributed to GE Engine Services Distribution LLC that accompanied GE CF6 engine parts but was not issued by GE Engine Services Distribution LLC".

Headquartered in the UK, AOG has supplied parts globally for the world's best-selling passenger aircraft engine (the CF56) and most-used cargo aircraft engine (the CF6) since 2015. The parts were mostly sold to overseas companies that install airline parts, as well as some UK airlines, maintenance providers and parts suppliers.

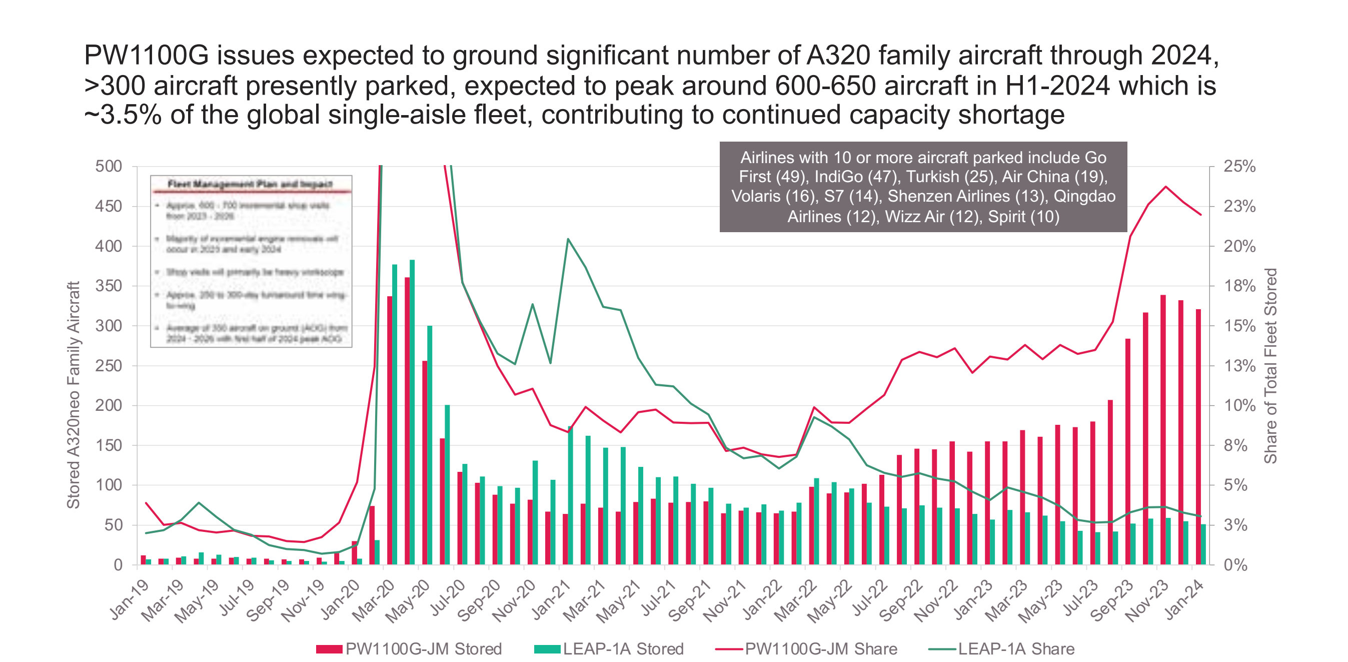
In August 2023, UK Civil Aviation Authority (CAA), the United States' Federal Aviation Administration and the European Union Aviation Safety Agency issued alerts to aviation businesses that may have bought or installed AOG's parts. Some planes were grounded in the UK and US, with several airlines confirming they had suspect parts in their engines. Some 145 engines are reported to have been affected.

The use of unapproved parts in a CFM engine invalidate CFM warranties and guarantees and other obligations. Operators were forced to undertake unscheduled maintenance work to verify all parts in their CFM56 engines supplied by the parts suppliers and/or fitted by the MRO company.

Several weeks later the news was picked up by the mainstream press and the criminal investigation into AOG Technics reached a new high point in December 2023 when the UK's Serious Fraud Office (SFO) announced that it had arrested one individual following a dawn raid on premises relating to the supplier. SFO investigators, accompanied by officers from the National Crime Agency, revealed that they had seized material from a site in Greater London and that one individual was currently being questioned.

The SFO said in December that it was working closely with the CAA and other regulators to examine the information obtained as it advances its criminal investigation into suspected fraud at this firm and determines whether there are grounds for prosecution.

CFM launched civil action against AOG Technics and its sole director and shareholder Jose Zamora Yrala in September 2023 in the London High Court. The case is continuing.



Source: Cirium

FIG. 24: CIRIUM. ENGINES STORED / PW1100G V LEAP-1A MARKET SHARE

of October 2023. He confirmed that all the GTF neo engines in Spirit's fleet, including the engines slotted for future aircraft deliveries, are in the potential pool of engines subject to the inspection and possible replacement, of the powdered metal high-pressure turbine and compressor discs. Spirit said it anticipated an average of 13 Neos in January 2024 rising to 41 in December, "averaging 26 grounded for the full year 2024", which has impacted the airline's near-term growth projections. For the full year 2024, Spirit estimated capacity will range between about flat to up mid-single digits compared to the full year 2023.

Spirit said it had begun discussions with Pratt & Whitney regarding "fair compensation for financial damages related to the GTF neo engine availability issues", adding that the amount, timing and structure of the compensation that will be agreed upon was "not yet known".

Wizz Air is also badly impacted. Chief executive Jozsef Varadi announced in November 2023 that the airline had "just entered into an operational support and financial settlement agreement with Pratt & Whitney", which had created "predictability for operations" and "predictability for the offsetting of the financial impact". The financial settlement was not disclosed but Varadi noted that the real impact was operational since the airline is facing the grounding of 25% of its fleet in 2024.

Varadi said that the airline had taken a number of actions to protect capacity going forward, including extending existing aircraft leases, continuing with accepting new aircraft deliveries – with 30 aircraft due for delivery in 2024. "We are expecting to ground around 45 aircraft as of January," Varadi said. "We will certainly learn how exactly the programme is going to unfold in terms of induction times of engines and recovery times in the shop, but this is a pretty good estimate". Modelling the workscope times for each engine, Wizz Air expects the disruption to last 18 months, subject to MRO shop and materials availability as well as turnaround times (TATs).

Air New Zealand, which has 17 A320/321neo aircraft in its fleet of 108 aircraft, said that the RTX fleet management plan would "further reduce engine availability" and has caused it to revise its flight schedule. Air New Zealand has cancelled two international routes to Hobart and Seoul from April 2024.

Air New Zealand chief executive officer Greg Foran called the impacts of

> **"Typically pre-Covid, it took 45 days to get any engine through a shop visit prior to the GTF issues. Now we are getting quotes from 210 to 270 days to shop an engine."**
>
> *Greg Conlon*
> *Chief Executive Officer of High Ridge Aviation*

the Pratt & Whitney servicing schedule change "significant" that could impact services for "up to two years". Due to engine availability as a result of the P&W maintenance issues, he confirmed that the airline would have up to four aircraft grounded at any one time.

"Leasing additional aircraft is an option we are looking at closely," Foran said in November. "Our latest leased Boeing 777-367ER aircraft is about to enter service and we are considering other lease options.

Lufthansa has a total of 73 A320neo and A321neo aircraft are currently flying in the Lufthansa Group. Of these, 64 are flying with this engine at Lufthansa Airlines, CityLine, Austrian Airlines and Swiss. This means that around 146 engines are affected within the Group. "We currently expect around 20 A320neo family aircraft to be unavailable every day in 2024," a spokesperson told *Airline Economics*. "This represents less than one-third of the Lufthansa Group's A320neo fleet and less than five percent of the Group's total A320 fleet of more than 420 aircraft."

Lufthansa has been extending the service of existing A320 Family aircraft, procuring additional spare engines and looking to wet lease arrangements. The company also has been aided by the fact that it also operates LEAP-powered A320 Family aircraft as well as the added benefit of its captive MRO shop, Lufthansa Technik.

Lufthansa chief executive Carsten Spohr has confirmed that thanks to the group's countermeasures and its "direct access to the scarce and extremely in-demand MRO capacities" there was no impact to the group's capacity outlook for 2024. The group still intends to take delivery of 30 aircraft this year and Spohr says that the company is "better positioned than others to grow profitably in this environment".

IAG has identified 32 affected aircraft (less than 10% of IAG's short haul fleet) and said it was "taking steps to mitigate prospective time out of service of those aircraft over the next three years".

Delta Air Lines CFO Dan Janki commented that although the impact of the required inspections to the airline would be minimal since its A321neos were later in the delivery cycle, he voiced concerns about the knock-on impact of the disruption to the production cycle for new engines and new aircraft deliveries considering the still fragile supply chain.

All impacted airlines have been negotiating with their existing lessors to extend current lease agreements to cope with the AOGs and capacity constraints

"This issue will have a fundamental impact on supply and demand. With 3,000 engines needing inspection – an average of 300 aircraft on the ground at any time between now and 2026 – that's 2% of the global capacity of single-aisle aircraft with a peak of around 680 in the first half of this year. That is driving positive value pressure especially for spare engines – if you could find one because airlines need the asset flying to generate revenue"

Rob Morris
Global Head of Consultancy of Cirium

while their engines are inspected and parts replaced. For the most part, airlines are reporting that their leasing partners are being accommodating but there are also reports that while lease rates may be holding steady, lessors are strengthening maintenance reserves and lease return conditions for lease extensions leading to potential increased costs further down the line.

Availability of leased aircraft was already reduced but this issue has added further pressure on the leased fleet. Airlines are reporting premium prices for new leases of in-demand narrowbody aircraft. This is good news for lessors since lease rates have been lagging behind two years of interest rate rises and additional demand will help to correct that market dynamic. However, the fallout from older aircraft flying for longer means both fewer used serviceable material onto the market, and once they come off lease, more engines requiring shop visits, exacerbating the already strained MRO capacity.

GTF customers are commenting that P&W is working with them to both fix the issue with their engines and providing compensation but such a large maintenance issues is already causing knock-on issues. Delta Air Lines chief Ed Bastian commented that P&W's providers and suppliers had put all of their resources against the GTF issue noting that situation also "strips away resources from maintenance work on their existing business with us". He added that Delta was "working through as efficient a manner with Pratt" also commenting on the state of the parts and repair side of the business that are still struggling with a skills gap since the pandemic that is impacting turn times. "All of the suppliers in our industry lost a tremendous amount of experience due to the pandemic; it is taking time to get that back, to get the turn times down to where they need to be" said Bastian, adding that higher turn times translate into delays and higher costs.

The more positive industry observers hope that in the best case scenario airlines would emerge from this crisis with a healthy bank balance boosted by compensation payments along with engines fresh from the shop with full greentime, enhancing residual values. The more pessimistic observers are predicting this enforced AOG could push some airlines into bankruptcy.

"For once the OEMs are facing the issue but the scale is so big it could push some airlines into bankruptcy," said one lessor.

The larger airlines are working to secure additional capacity and work through maintenance challenges but smaller airlines may find the disruption too great to withstand. With less purchasing power and influence with lessors than the larger airlines, there is some concern that smaller airlines will disproportionately suffer from elevated levels of aircraft groundings for maintenance issues.

SKY's Wiley commented that the company was spending more time discussing contingency plans with its airline customers such as whether they have sufficient spare and/or the right mix of aircraft that will enable them to continue to operate. "Smaller airlines have less access to spare engine solutions to manage the operational costs that come from [these] significant groundings," he says.

P&W is working with all operators but the scheduling of the work from the largest to the smaller operators, as well as the work needed on new engines, is unknown. Austin Willis says that although P&W is "doing what it can to support the customer base", he adds that "Willis Lease is going what we can to get the engines into the hands of the airlines that need them to try and support the whole process and lessen the impact."

Willis also posed the question of what the long-term implications will be from the GTF engine maintenance issue once the issue is resolved. "What the GTF market looks like after this subsides is still to be determined but although there is the potential for oversupply of engines in the midterm, the expectation is the fleet will grow its way out of it."

Firoz Tarapore, who heads DAE, which owns a share in MRO business Joramco, said that the fact the P&W GT maintenance issue now has a fix and a "finite time horizon" is a positive development and hopes it will result

"The OEM has owned the problem, they have a plan and they are fixing it. We are getting there slowly but airlines have been given a planning horizon now so they can source alternative capacity to deal with the shortage, which is much better than uncertainty."

Firoz Tarapore
Chief Executive Officer of Dubai Aerospace Enterprise

in more reliable and more efficient engines. "The OEM has owned the problem, they have a plan and they are fixing it," he says. "We are getting there slowly but airlines have been given a planning horizon now so they can source alternative capacity to deal with the shortage, which is much better than uncertainty."

Rob Morris, Cirium's global head of consultancy, says that the GTF issue will have a fundamental impact on the industry for some time, affecting both capacity and lease rates, noting that the demand and supply imbalance is already having an impact on lease rates. "This issue will have a fundamental impact on supply and demand," says Morris. "With 3,000 engines needing inspection – an average of 300 aircraft on the ground at any time between now and 2026 – that's 2% of the global capacity of single-aisle aircraft with a peak of around 680 in the first half of this year. That is driving positive value pressure especially for spare engines – if you could find one because airlines need the asset flying to generate revenue."

The latest engines issues are driving many airlines to rely on older kit for maintaining or growing their capacity. The trend is benefitting the MRO market, with slots filled for years ahead. "During Covid, airlines were delaying shop visits and burning their greentime, grounding airplanes," says Meijers. "When the market picked up, a lot of engines had to go through the MRO shops and the turnaround times had increased. With the problems we are seeing now with the durability of some of the new tech engines, there is even more stress on the supply side. For the next few years, this is going to drive up used asset values. We are seeing that already quite extensively on the older technology aircraft but on new technology as well."

Cirium's Morris said that he had heard of "a 24-year old A320 family aircraft that was scheduled for part out that will now probably go through a heavy check, another engine shop visit, to return it to service for a while longer", adding that the trend to delay retirement will enable continued growth of the fleet even in the face of such production and maintenance delays.

Demand for older equipment is a common observance made by aircraft lessors. "Demand is very strong," says Aircastle's Inglese. "Because of the supply chain and engine issues in the market, we are seeing neo operators looking for ceo aircraft to help them with lift as they grapple with how they're going to deal with the groundings and their engine repair work."

This sustained impact on demand will impact capacity and potentially constrain growth. Rob Morris notes that growth will be slower than in recent years, but adds that this is a positive for airlines since constrained supply enables them to continue to "manage price upwards".

SUSTAINABILITY

Sustainability goals are driving the move to refleet. Production delays have made is arguably even more essential for airlines to secure their delivery slots with large orders sooner rather than later to delivery on sustainability targets.

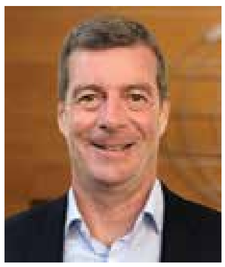
Lufthansa's Spohr noted that "every new model aircraft uses up to 30% less kerosene" saving carbon emissions. By 2030, Lufthansa group airlines will take delivery of more than 200 new fuel-efficient aircraft and the company is also retrofitting older kit with new technology such as AeroShark – the bionic film covering the aircraft that optimises airflow and saves fuel. Lufthansa says it makes the aircraft 1% more efficient but has the potential to save up to 3% with future development.

New equipment is only one part of the sustainability journey for airlines, many securing contracts for the supply of sustainable aviation fuel (SAF) and some are also finding other creative ways to meet their sustainability targets, such as carbon capture and carbon offsets.

The lack of supply of SAF has been widely discussed but airlines, manufacturers and oil refiners are working together on myriad ways to scale production. One such concept it the development of power-to-liquid aviation fuels. Lufthansa is collaborating with Airbus, Munich Airport and MTU Engines to research P2L fuels.

"When the market picked up, a lot of engines had to go through the MRO shops and the turnaround times had increased. With the problems we are seeing now with the durability of some of the new tech engines, there is even more stress on the supply side. For the next few years, this is going to drive up used asset values. We are seeing that already quite extensively on the older technology aircraft but on new technology as well."

Paul Meijers
Executive Vice President - Commercial, Aircraft Leasing, Trading & Financing of Airbus



Optimism Rules

The commercial aviation industry seems to be beset on many sides by a series of major challenges: manufacturing defects, supply chain and maintenance delays caused by a shortage of resources and labour, as well as higher interest rates, higher inflation, a volatile geopolitical situation, the constant pressure of decarbonisation in a worsening international picture in a year of elections. Despite all of that, the delays, the shortage of capacity, consumers with less disposable income, air travel will continue to grow in 2024 and for the near-term future - another global exogenous shock notwithstanding. Optimism levels are high - albeit with cautious of the many headwinds building on the horizon but after the deep downturn of the pandemic, there seems to be just relief that the challenges and issues ahead are of more “normalised” nature and one that the aviation industry is confident it can meet head on and triumph.

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