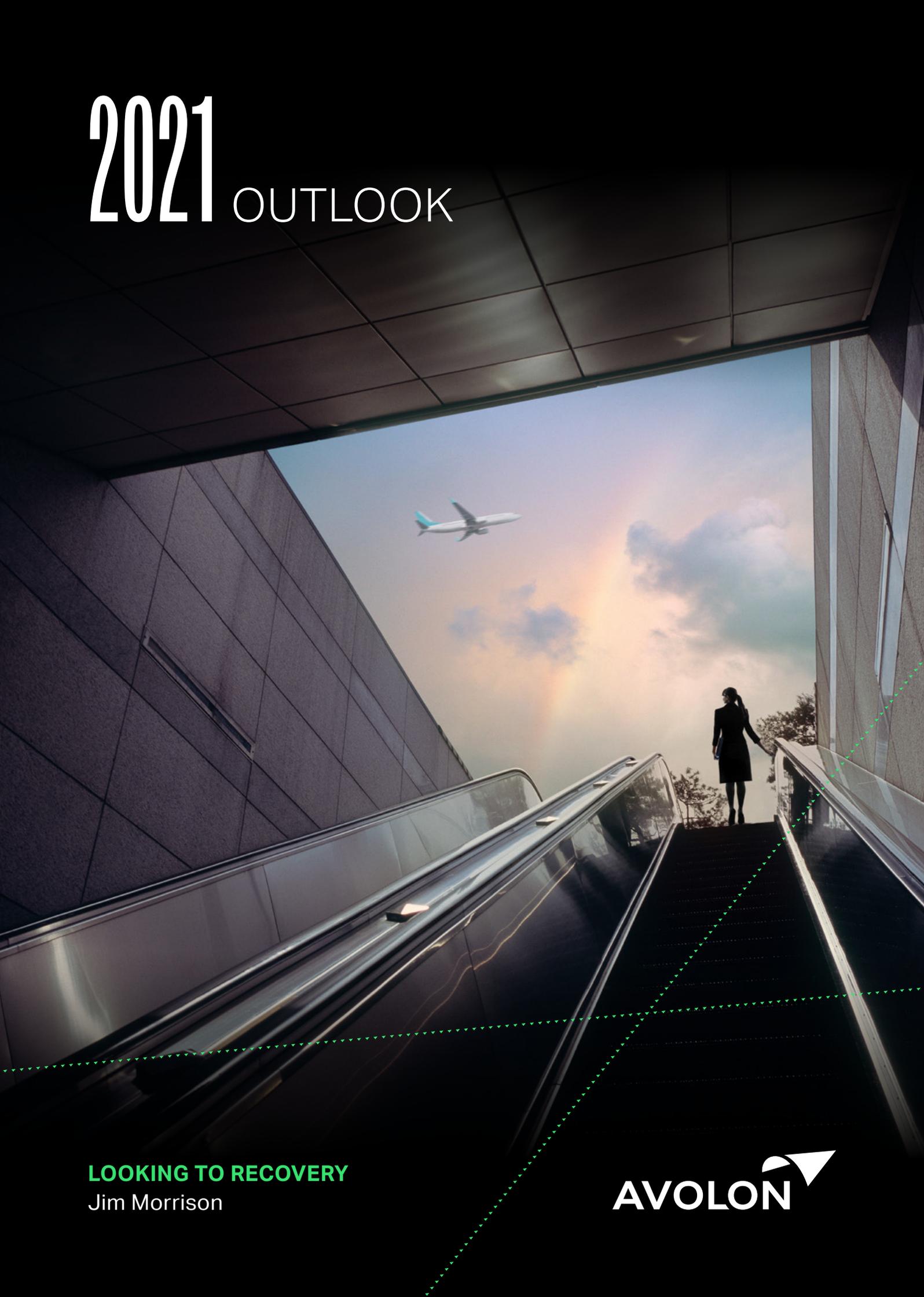


2021 OUTLOOK



LOOKING TO RECOVERY

Jim Morrison

AVOLON 



Navigating through the turbulence made 2020 the most challenging year the commercial aviation industry has ever faced.



INTRODUCTION

Navigating through the turbulence made 2020 the most challenging year the commercial aviation industry has ever faced. The pandemic caused a synchronized, sharp downturn. Global GDP fell 4-5% while passenger traffic dropped two-thirds. Airlines worldwide suffered an estimated net loss of \$118 billion, putting more than a third of the industry's 2.9 million jobs at risk.

Fewer new commercial aircraft were delivered in 2020 than any year in the past two decades, marking the end of the aviation super-cycle that commenced after SARS was contained in 2003. COVID-19 has amplified strengths and weaknesses, pummeling businesses that were over-extended after a decade of growth. Governments stepped up with nearly \$190 billion of support for airlines while aircraft lessors provided an additional estimated \$35 billion in payment deferrals, lease restructurings, and sale-leaseback financing.



Vaccines offer the spark that will reignite the industry. 2021 may be a tale of two halves: the first depressed, the second ebullient.

Aviation's resilience has been demonstrated repeatedly through history, enduring wars, terrorism, pandemics, oil spikes, and financial crises. Entrepreneurship and innovation drive continuous efficiency improvements, enabling more people and goods to connect to more places at lower cost. As a dark winter encloses the northern hemisphere, vaccines offer the spark that will reignite the industry. 2021 may be a tale of two halves: the first depressed, the second ebullient. With a \$39 billion net loss forecasted in the year ahead, many airlines will struggle to survive, but the importance of air travel to society and the economy remains undiminished. Recovery is likely to be gradual and uneven, with timing uncertain. The aviation industry is waiting for takeoff, ready when clearance is granted.

The authorization and distribution of multiple vaccines will shape 2021. Re-opening societies, economies, and borders will drive air traffic recovery. Decoupling of the world's major economies may counteract decades of globalization, but regionalized supply chains and a

renewed focus on domestic travel creates opportunities as well. Relations between the United States and the world will be reset by a new administration. A trade war with Europe may be easier to resolve than one with China. Each geopolitical skirmish impacts aviation. Today, tariffs impede the import of aircraft between the home countries of Airbus and Boeing while the ability of Chinese and Russian manufacturers to rely on foreign suppliers has been put in doubt. Bilateral treaties that facilitate the flow of passengers rely on trust between nations. In an era where trust is short, airlines may suffer the consequences.

Crisis leads to creative destruction. Domestic-focused, low-cost carriers with variable cost structures will capitalize on the retrenchment of competitors. Despite years of operational challenges, Airbus is remarkably well positioned in an aircraft manufacturing landscape that includes a convalescing Boeing, re-strategizing Embraer, departed Bombardier and Mitsubishi, and yet-to-arrive COMAC and UAC. Major lessors that managed their balance sheets to investment grade pre-crisis have demonstrated the strength of their unsecured capital structures. While the aircraft re-marketing challenge will stress origination teams, capital is available to pursue compelling opportunities.

Once the vaccine vials are emptied and aircraft tubes are filled again, aviation's impact on the environment will return to the fore. The global pandemic was a low-probability, high-impact event. Climate change is high-probability, high-impact. After securing near-term survival, long-term action is required. Fleet renewal has accelerated, fueling a rapid transition to new technology. The amount of fuel used to fly one seat, one kilometre today is likely 10-20% less than a year ago due to the parking of less efficient aircraft. Lessors drive technology adoption rates, managing nearly 60% of the delivered new-technology fleet and holding a significant share of future production slots.

Our 2021 Outlook reviews the key trends in the aviation industry for airlines, manufacturers, and lessors, identifying themes that are likely to shape the year ahead.



RUNWAY TO RECOVERY

2020 ended with domestic air traffic around 60% of 2019 levels and international at a dismal 12%, resulting in around 30% across all markets. Domestic markets in China and Russia recovered strongly in 2020 but other large markets, such as the U.S., India, and Brazil, are recuperating more gradually.



Nearly two-thirds of seat-kilometre capacity in 2019 crossed a border. International markets cannot begin to recover until borders are reopened and passenger confidence returns. Coordination of travel policies between governments will be critical. Testing is an important measure to be implemented broadly, even after vaccines have rolled out. Health passports will identify low-risk groups enabling governments to gain the confidence required to reopen borders. Consistent, data-driven travel policies will reduce quarantine times, encourage passengers to return to flight, and protect public health.

Vaccines may be deployed in sufficient quantities by the second half of 2021 to enable recovery to take hold. Full domestic recovery will raise world air traffic from ~30% of 2019 levels today to ~50%. Regional recovery, such as intra-Europe and intra-Asia, will increase traffic to ~67% of 2019 levels. To recoup the final third of lost traffic, long-haul international must re-start.

Will the twenties come roaring back as they did a century ago? Governments have deployed around \$13 trillion of fiscal stimulus while central banks dropped interest rates and injected another \$8 trillion in quantitative easing. Combined, liquidity amounting to a year of U.S. GDP has been unleashed on the world economy. Economic forecasts project 4-6% global GDP growth in 2021, led by China and trailed by the U.S. and Europe. Aviation's recovery will follow the lifting of travel restrictions, country-by-country, region-by-region. Once borders are reopened and the safety of air travel confirmed, the economy will again drive increasing passenger demand.



Corporate travelers can be less than 10% of passengers on a flight but contribute more than 30% of revenues. A change in passenger mix may ultimately require leisure travelers to pay more.

Re-establishing relationships will be more important in 2021 than ever before. There is pent-up demand to reconnect with friends, relatives, and customers. Household savings rates are the highest in decades, a strong tailwind for leisure travel recovery. Travel remains the best means for businesses to establish trust-based relationships and transfer tacit knowledge. While travel to meet with external clients is likely to rebound quickly, surveys indicate that up to 30% of pre-crisis business travel was for internal meetings. The widespread adoption of online meeting platforms may reduce the need to travel for some purposes. Corporate travelers can be less than 10% of passengers on a flight but contribute more than 30% of revenues. A change in passenger mix may ultimately require leisure travelers to pay more.



AIRLINE SURVIVORS AND THRIVERS

Airlines were the first aviation industry stakeholders to feel the brunt of the pandemic. Bookings evaporated, refund requests flooded in, and cash burn had to be financed. Around 50 airlines failed in 2020, representing around 5% of 2019 global capacity. Some 1,500 aircraft were likely permanently removed from passenger service as airlines advanced plans to retire non-core fleets, representing approximately 5% of capacity. 30% of the global passenger fleet remains in storage and those aircraft in service are flying significantly fewer hours. Airlines added \$220 billion of debt in 2020 to fund negative cashflow that is forecast to break-even only by late 2021. A decade of deleveraging will have to follow.

Downturns sort the weak from the strong. Reviewing the fate of the Top 100 airlines by capacity heading into the last downturn frames what may come in the years ahead. Of the largest carriers in 2008, 14 ceased operations or merged with a competitor in the ensuing decade. Another 17 stagnated with limited or no capacity growth. The remaining Top 100 airlines grew around the market average. The dynamism of the past decade was driven by 28 small or start-up airlines that grew into the Top 100 club, including Indigo, VietJet, Spring, Wizz, Pegasus, and Azul. Start-ups and carriers with growth ambitions will again be factors in this recovery. Though not all will be successful, those that are will redefine the competitive landscape.

Being nimble and ready to adapt to quickly changing market conditions will be critical in 2021. The crisis demonstrated the curse of high fixed cost bases. Airlines are shifting to variable cost structures to tune capacity to the level of demand that presents. While Europe's low-cost carriers led the recovery in the third quarter of 2020 when travel restrictions first lifted, they also led the pullback when the second wave hit in the fourth quarter. Dynamic scheduling is enabling agile airlines to test demand while limiting losses.

Airline revenues will be pressured as the lowest cost producers drop fares to capture passenger volume and the return of higher yielding business travelers is delayed. Network carriers will be forced to price match or risk not generating enough cash to cover to their higher fixed costs. Airline networks will need to be reconfigured, unable to rely on as many international transfer passengers to fill aircraft.



Capacity lost due to airline failures and fleet exits will enable survivors to increase asset utilization quickly when demand returns.

Capacity lost due to airline failures and fleet exits will enable survivors to increase asset utilization quickly when demand returns. If 5% of capacity is removed due to airline failures and another 5% due to retirements, 90 is the new 100. There has been a structural reduction in seat supply in response to a cyclical trough. Airlines will return to health prior to eclipsing the peak of the last cycle in 2019. If passenger demand comes back fast and airlines misjudged workforce and fleet reductions, constraints on the speed of recovery may emerge in some markets. The resulting increase in air fares may partially compensate for a slower return of corporate travelers.

Despite a 12% reduction in air freight volume in 2020, a 30% spike in yields led to an estimated \$15 billion increase in airline cargo revenues in 2020. While hardly an offset for the \$420 billion drop in passenger revenues, airlines scrambled to capture what they could, redeploying idle passenger aircraft. Cargo contributed 36% of airline revenues in 2020, a three-fold increase in share from a normal year. Carriers with strong cargo networks, such as Korean Air and China Airlines, were able to generate operating profits in some quarters of 2020. IATA expects cargo revenues to grow again in 2021 as fewer passenger flights and e-commerce growth pushes freight from bellies to dedicated aircraft.



RESETTING THE MANUFACTURERS GAME

The aircraft production system was the shock absorber this crisis. Rising production rates last decade disconnected from market fundamentals, reflecting increased supply of capital not necessarily increased demand for aircraft.

New aircraft deliveries dropped 45% year-over-year in 2020, down nearly 60% from the 2018 peak. This sharp fall is a massive challenge for manufacturers and their suppliers, operationally and financially. The aviation super-cycle has screeched to a halt.

Volatility in production rates is not new. Single-aisle deliveries dropped around 60% peak-to-trough in both the 1981-1984 and 1991-1996 downturns. The growth of Airbus over the past 30-years and an increasingly geographically diversified industry dampened the cycle. While Boeing cut deliveries by half 2001-2003, Airbus stayed flat. The feat of maintaining production was repeated through the 2008-2010 period, facilitated by an older average fleet age and higher fuel prices than today, supporting renewal. This time around no one was immune. Both Airbus and Boeing were forced to take their medicine.

Parts of the supply chain are in distress. Suppliers first navigated waves of contractual squeezes. Next, they invested to expand capacity in preparation for higher production rates. Then the 737 MAX grounding resulted in a production halt. Lower production rates following the pandemic will leave costly investments in people, tooling, and inventory idled. Reduced flying hours are depriving suppliers of high-margin aftermarket revenues. Large suppliers with exposure to defense markets have the balance sheets and diversified businesses required to weather the storm. Thousands of small and mid-size enterprises with limited access to capital are dependent on one or two commercial programs. These suppliers are most vulnerable, requiring time to heal. Financial distress among the supply chain sets a speed limit on how fast Airbus and Boeing can raise rates once recovery takes hold.

The aircraft manufacturers' competitive game has been reset. With the sale of the CRJ program, Bombardier exited commercial aviation in 2020. Embraer struggled to find itself again following its missed connection with Boeing. COMAC's C919 and Irkut's MC-21 may enter service in 2021. Both will capture a share of their home markets, but their acceptance abroad remains a question. The reliance of these new entrants on foreign suppliers will be a critical challenge if the geopolitical decoupling trend continues. China took delivery of a quarter of new single-aisle aircraft over the past decade. Reduced access to Chinese carriers would have a major impact on western manufacturers' production ambitions.

Following over a thousand 737 MAX order cancellations in 2020 and slowed production ramp-up plans, Airbus' A320neo Family is poised to achieve 60% or higher single-aisle delivery market share. The success of the A321neo is driving Airbus' advantage. Don't count the MAX out just yet. Delivering the current backlog of nearly 3,300 aircraft would render the MAX the fourth most successful commercial aircraft program of all time, only behind the A320neo, 737 NG, and A320ceo Families. With over 250 airlines operating 737 Family aircraft, Boeing has ample fleet renewal opportunities to seize in the decade to come. Lessors were forced to pause marketing their order commitments. An imminent global recertification will result in lessors again facilitating an expanding operator base. Given its debt burden and need to generate cash, Boeing is not in a position to launch a replacement aircraft any time soon. Nor is one required. Loyal Boeing customers, such as Ryanair and Alaska, are seizing the opportunity to increase their MAX commitments now.

Too many widebodies were built last decade creating an oversupply today. Production rates will need to be reasonable for years to come. Both Airbus and Boeing have each cut rates to around seven aircraft per month across their twin-aisle families, half of 2019 levels. Very large aircraft have been parked in droves and Boeing's 777X entry-into-service pushed back. New-technology, mid-size twin-aisles, such as the 787, A330neo, and A350, have retained their sheen this crisis, returning to service faster than current generation types. Given lower seat capacity and longer range, new-technology twin-aisles are well positioned to provide the direct service that will be in-demand once borders reopen.

The biggest challenge for the manufacturers in 2021 is to drawdown the inventory of built aircraft that have accumulated. Airbus and Boeing are carrying nearly 550 built, undelivered aircraft valued at over \$30 billion. While the 737 MAX is the largest holding, 787 production quality issues and Airbus' own challenges delivering twin-aisles have added to the stockpile. Securing financing will be critical to delivering built aircraft. Export Credit Agencies (ECAs) are open for business again, but lessors will supply the majority of the capital required.



LESSORS ARE KEY TO RECOVERY

Aircraft lessors were stressed in 2020, but far from broken. The resilience of the business model is built on diversified portfolios, optimized funding models, global marketing platforms, long-term leases, asset management expertise, and strong relationships with the manufacturers. While rent deferrals, airline restructurings, and asset impairments reduced profits, all investment grade lessors maintained their credit ratings.

Leasing will be integral to airlines' recovery plans. Carriers with asset-light business models are better positioned to experiment with new routes given more variability in their cost structures and flexibility in their fleet plans.

Capital markets remained open to lessors in 2020, providing over \$17 billion of unsecured financing. Airlines raised over \$49 billion in capital market transactions, most of which were secured by aircraft, loyalty programs, slots, and even brands. Recovery in the banking market will lag the capital markets as credit committees remain risk-off. The Asset-Backed Security (ABS) market started 2020 with six deals that raised \$2.5 billion but came to a standstill in March when the virus went global. While the aircraft ABS market took several years to return following the Global Financial Crisis, a strong appetite for yield in an ultra-low interest rate environment will support recovery. Higher quality lessees, greater portfolio diversification, and further credit mitigants will be key to structuring new transactions that are attractive to investors.



Lessors will re-capitalize airlines and enable manufacturers to deliver new aircraft, fueling the continued growth of the leased fleet.

Lessors will re-capitalize airlines and enable manufacturers to deliver new aircraft, fueling the continued growth of the leased fleet. Operating lessors today manage 46% of the delivered passenger jet fleet, a five percentage point increase in the past five years. With a half-life market value of around \$320 billion, half of the world's delivered fleet by value is managed by operating lessors.



Depressed aircraft values present a once-a-cycle opportunity for aircraft investors to deploy new capital at attractive returns. Sale-leaseback has returned as the primary growth channel for lessors, providing delivery financing that moves built aircraft out of the manufacturers' parking lots and releases airlines' equity in used aircraft. Airlines require certainty, seeking to transact with counterparties they can rely on to reduce execution risk.

There is a re-marketing challenge ahead for lessors. The inventory of lessor managed aircraft in storage without an operator reported by Cirium has nearly doubled over the past year, although off a low base. Most of these aircraft are older and may be suitable for passenger-to-freighter conversion or engine green-time leasing. The part-out market is expected to be weak through 2021 but will eventually recover as flying hours increase.



FEARLESS FORECASTS

While we did not call for a pandemic in our outlook a year ago, we will haggle for part-marks for our predictions. Boeing's 737 MAX did return to service and several were traded. No new aircraft programs were launched, but delivery schedules were disrupted. The mid-life space was chilled and older metal was pushed out of the fleet in droves. Despite the unprecedented headwinds, capital markets remained open to established players.

While the ABS market had a strong start to 2020, airline credit concerns halted trading when the pandemic hit. Some governments in Europe attached green strings to their aviation support packages, including investments in hydrogen technologies and mandates to retire aging aircraft. Numerous airlines made carbon neutral pledges, invested in sustainable aviation fuels and even carbon capture technology, although it will be a long journey.

The year ahead is clouded in uncertainty, but the fulcrum is clear: How quickly will vaccines be deployed and when will governments have the confidence needed to re-open borders? Aviation will play a key role in the distribution effort, but the ability of vaccines to stop the virus remains outside of the industry's control. When others are fearful it may be time to be brave. Our fearless forecasts for 2021 are premised on optimism but anchored by realism that challenging months are ahead.

1. Recovery will be quicker than currently anticipated.

The market consensus is for a return to 2019 passenger traffic levels only in 2024. Three immovable forces will drive recovery: vaccines, fiscal stimulus, and monetary easing. When the first contains the virus, the latter two will drive the economy and passenger demand for air travel. Stronger airlines will capitalize on weakened competitors, redeploying capacity to markets that are open for business. Short sectors will initially drive recovery, attracting more than the 50% of 2019 RPKs that IATA currently projects in 2021.

2. Major airlines survive, LCCs thrive.

Government support has assured survival for most flag carriers, but structural costs may not have been readjusted sufficiently to win in the next wave of airline competition. Low-cost carriers with high variable costs, asset-light business models, and domestic / regional network focus are best positioned to thrive.

3. There will be more start-up airlines in 2021 than failures in 2020.

There are already more than 30 airlines that have announced plans to launch operations in the wake of the pandemic. A number were in gestation pre-pandemic and plenty more were unveiled opportunistically. Some established carriers will use new airlines to shed the burden of legacy contracts. Not all will get off the ground but some of the highest growth airlines in the next decade will get their start this year and next, following the airline playbook of past downturns.



4. Two-thirds of new passenger aircraft deliveries will be financed by lessors.

A lack of financing is the biggest challenge to manufacturers meeting their delivery targets. The airline funding gap will be closed through lessor placements and sale-leasebacks. A structural shift in airline balance sheets is underway that will lead to continued growth of leasing.

5. A decade without a new clean-sheet aircraft.

In the 2000s, climbing fuel prices, advances in engine technologies, the threat of competition from ambitious regional jet makers, and aging product portfolios resulted in a flurry of new aircraft programs that entered service over the past decade. None of these factors are relevant today. Competitive dynamics between the manufacturers have changed and the cash gusher from the most profitable programs has halted for now. No new clean-sheet commercial aircraft from a western manufacturer will enter service prior to 2030. With no new programs to obsolete the existing types, aircraft residual values will be protected in the long-term.



Not flying is not the pathway to decarbonizing. 2020 demonstrated how painful reduced connectivity is to families, businesses, and workers. Aviation is critical to modern societies and growing economies.

6. The environment re-surfaces as the major challenge of the decade.

Not flying is not the pathway to decarbonizing. 2020 demonstrated how painful reduced connectivity is to families, businesses, and workers. Aviation is critical to modern societies and growing economies. The trick will be to increase mobility while decreasing emissions. Disruptive technology will play a key role in reducing aviation's carbon footprint, but the power of incremental improvement must not be overlooked. Fleet renewal improves the efficiency of air travel. Lessors accelerate technology adoption. Air traffic management systems must be modernized, sustainable aviation fuels must build scale, and new technologies must be developed. This is a global challenge to which all stakeholders will share in the solutions.



THE AUTHOR



Jim Morrison

Head of Portfolio Management

Jim Morrison is the Head of Portfolio Management at Avolon, responsible for identifying and projecting key industry trends, performing market analysis, monitoring aircraft values and managing aircraft appraiser relationships, evaluating asset risk and developing aircraft investment cases. Jim has over fourteen years of aviation industry experience with leasing, manufacturing, research, and technology organizations.

Jim joined Avolon in 2017 having previously held airline marketing, aircraft evaluation, market analysis, and product strategy roles with CIT Aerospace and Bombardier Commercial Aircraft. Jim is an ISTAT Certified Appraiser and a licensed Professional Engineer in Ontario. He holds a Master of Science in Technology and Policy from the Massachusetts Institute of Technology and a Bachelor of Applied Science in Engineering Physics from Queen's University, Kingston.

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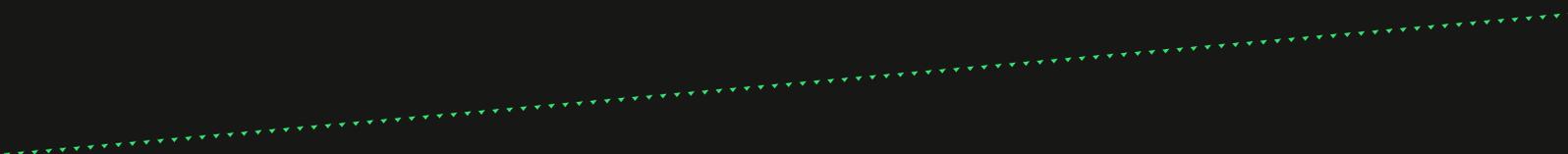
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Avolon Holdings Limited
Number One Ballsbridge
Building 1, Shelbourne Road
Dublin 4, Ireland

info@avolon.aero
avolon.aero



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