

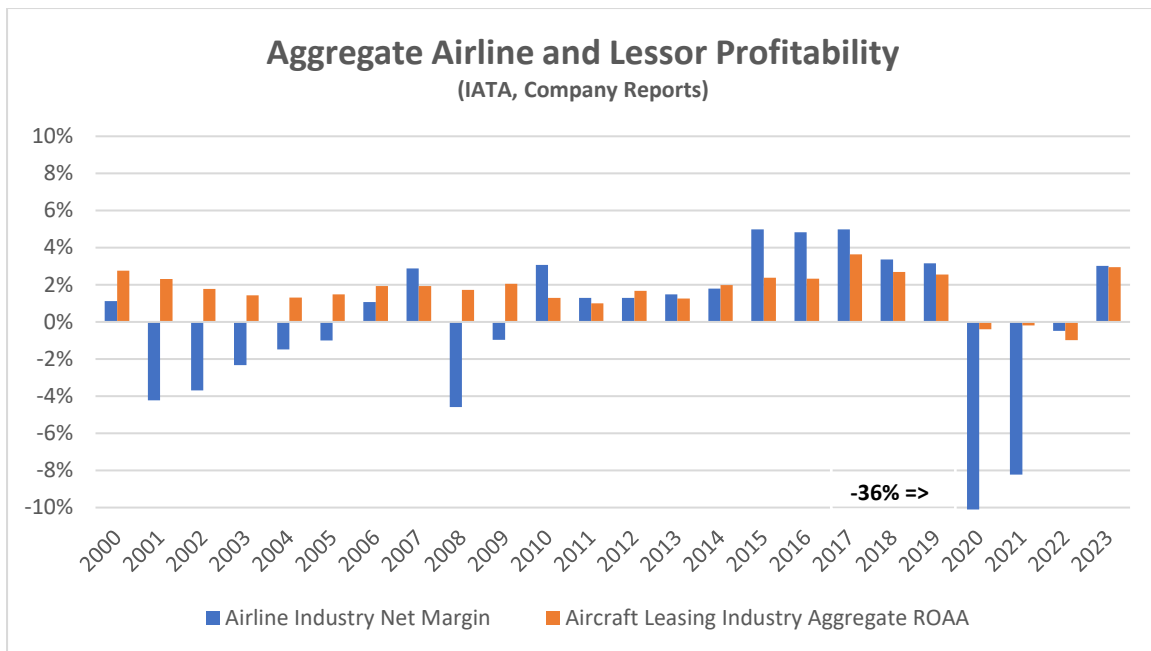
Sirius Aviation Capital

Air Transport Industry Update Q3 2024

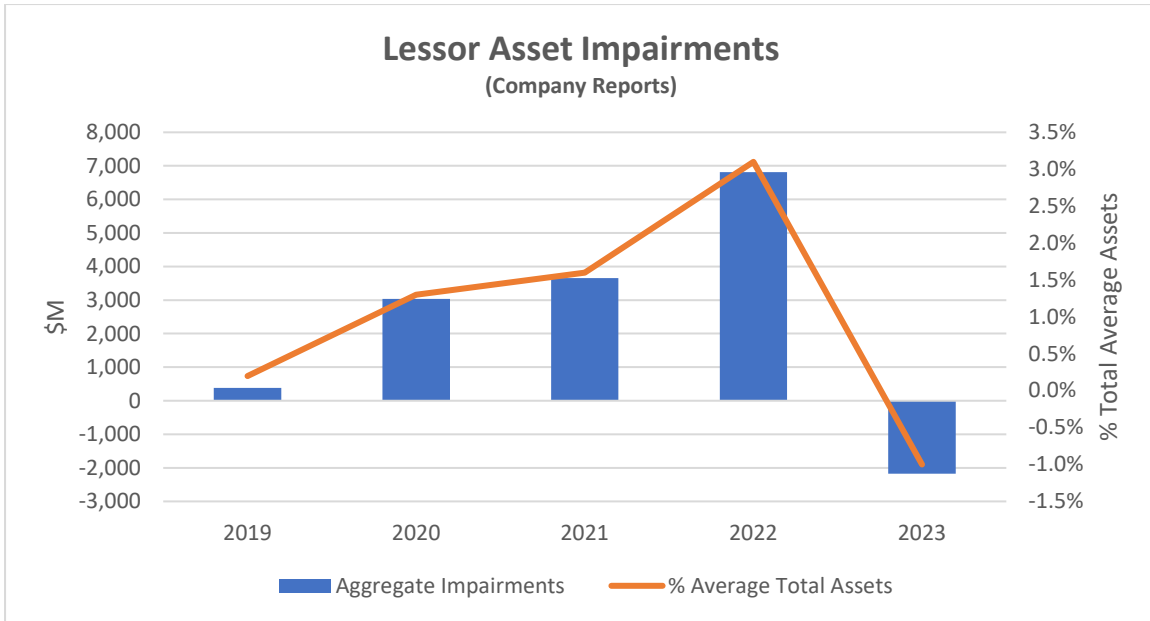
- **SPECIAL TOPIC – Aircraft Leasing Industry Financial Performance**
- Macro-Economic Background
- Traffic and Aircraft Demand
- New Aircraft Supply
- Airline Industry Financial Performance

Aircraft Leasing Industry Financial Performance

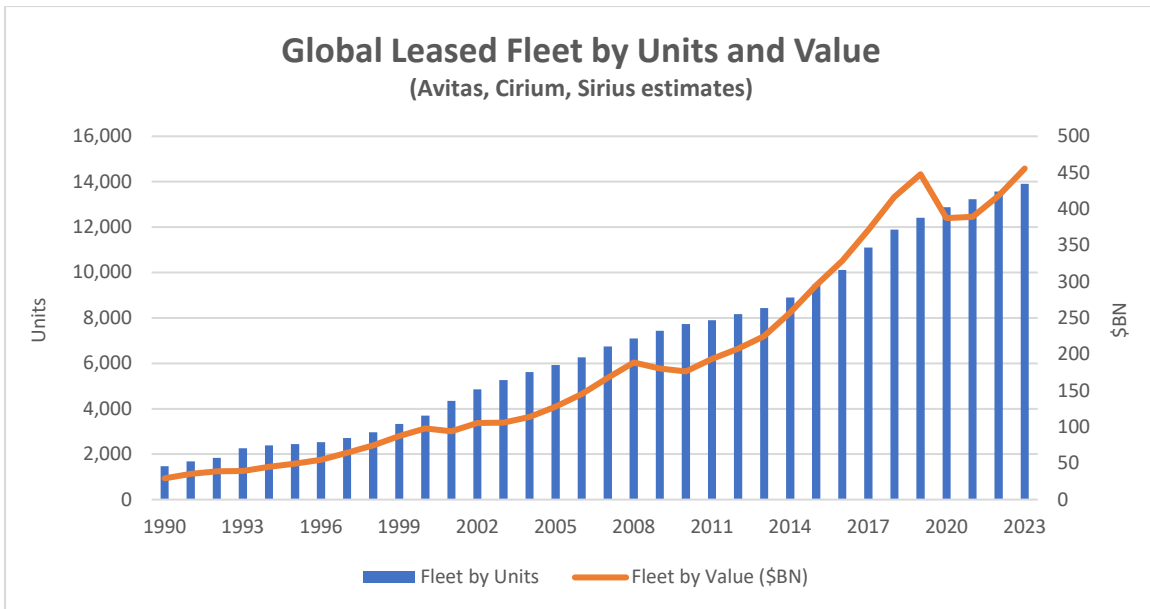
2023 saw a significant improvement in the profitability of the aircraft leasing industry. There were no major asset write-downs such as those incurred because of Covid, and the de facto expropriation of most aircraft leased to Russian airlines in 2022. In fact, several lessors were able to write back some of the latter charges as they received partial insurance settlements. Despite these unprecedented problems the aggregate performance of the industry has been relatively stable, particularly relative to the performance of the airline industry¹.



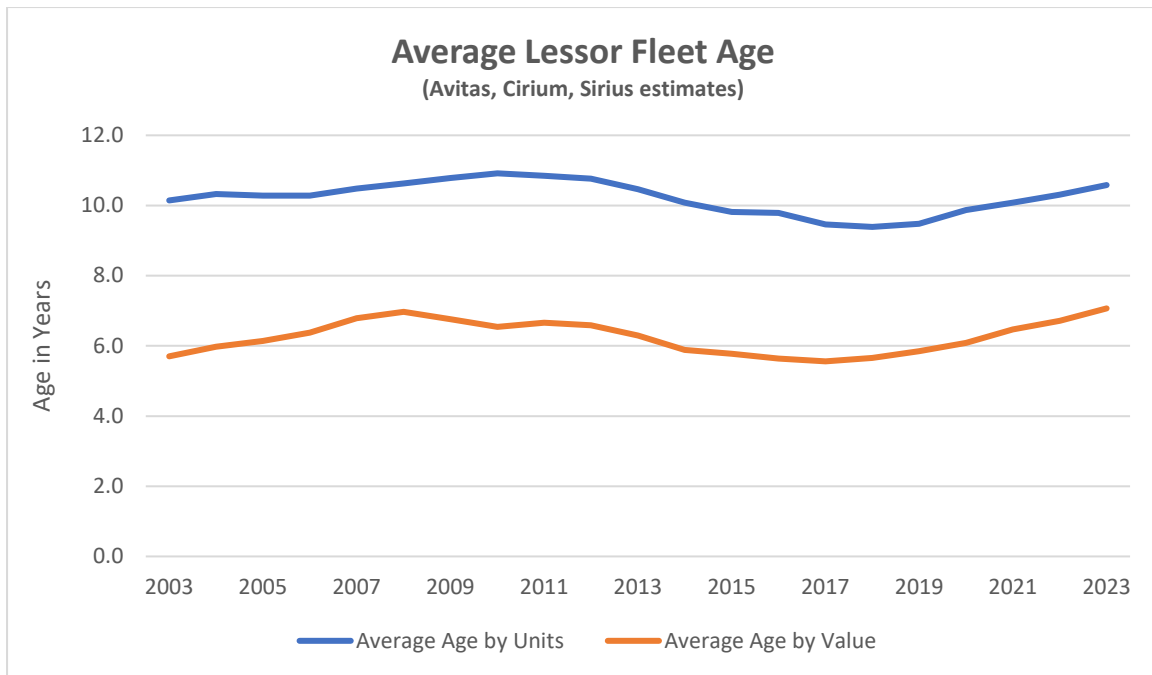
Asset impairments and write-backs have had a huge impact on aggregate industry results since 2020 as shown in the chart below. Insurance settlements in respect of aircraft expropriated by Russia are likely to have a positive impact on results in 2024 and beyond. Most amounts paid to lessors to date have been received from Russian insurers while litigation with western insurers continued. However, AerCap recently settled some of its claims with the latter which may presage more payments. It is a measure of the defensive financial strength of the industry that there has been very little financial distress in this period. Two lessors sought court protection, NAC and Voyager, which both had niche asset strategies based on regional and widebody aircraft respectively. None of the major lessors with more diverse aircraft fleets suffered a credit rating downgrade.



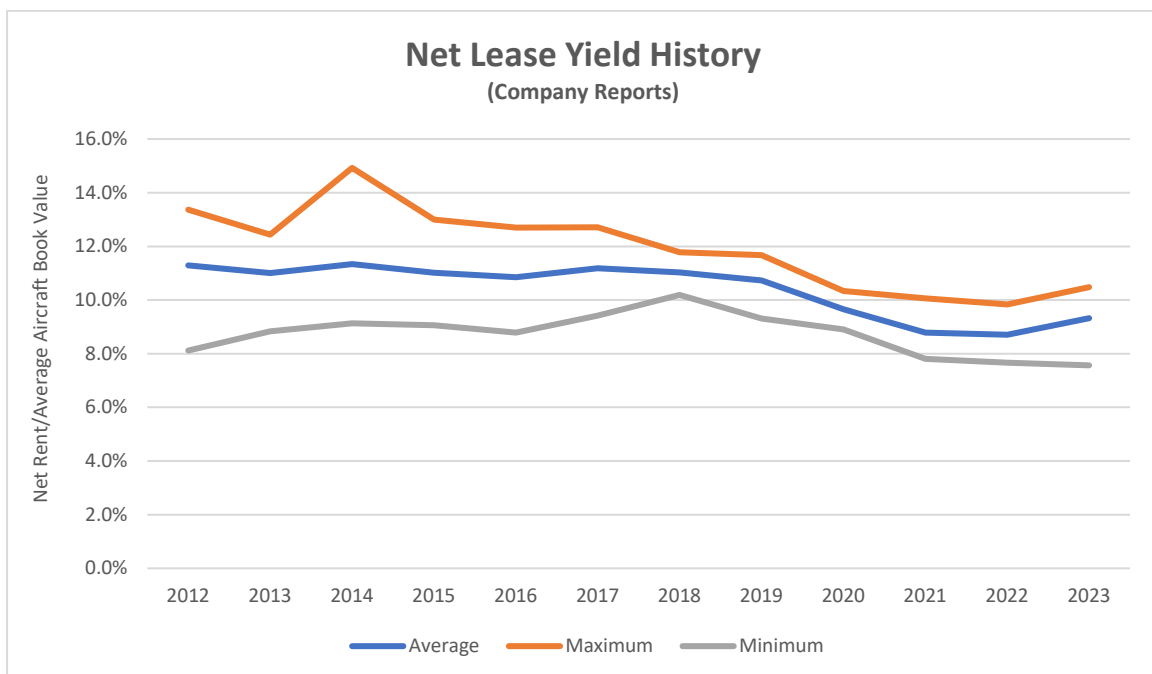
Before we discuss underlying financial performance it's worth a detour to note some important changes to the industry background for aircraft lessors. First growth in terms of asset value has slowed down. This is mainly due to the disruption of new aircraft deliveries particularly at Boeing which is discussed in more detail below. There has also been some impact from cyclical changes in aircraft values although this has largely worked its way through the system (the chart below uses Avitas Market Values where available). This increases competition between lessors in the new aircraft market as most of them have targets for balance sheet growth although there are fewer deals available.



One side effect of the reduced level of new acquisitions is that the lessor fleet is ageing. This matters because an older fleet is likely to have higher levels of off-lease aircraft which may or may not be offset by higher rental income relative to aircraft book value. As the chart below shows age on a unit basis is consistently higher than on a value basis, which is the preferred age metric for analysing lessors. Average age by value is at its highest level in the last 20 years and is likely to increase further given the shortage of new aircraft deliveries.

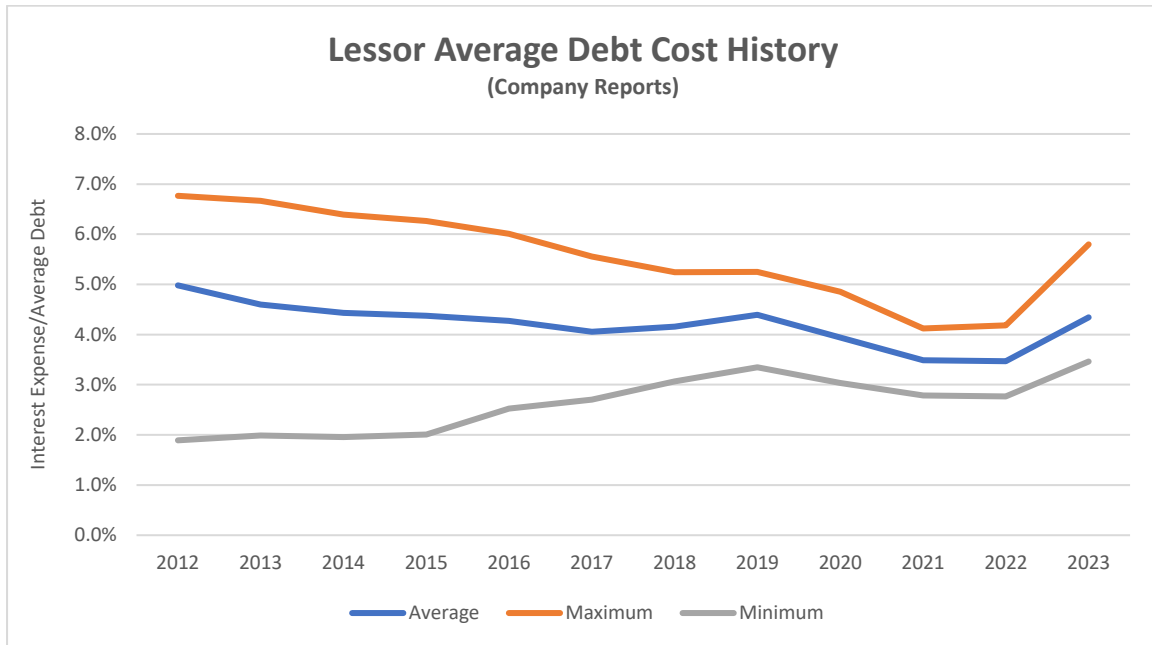


We believe net lease rental yield is a key measure of underlying performance. This ratio is the net rent earned by the lessor excluding maintenance rent etc. as a percentage of average aircraft book value and is analogous to rental yield in commercial property². The chart below shows the range of yields achieved by the group of lessors we follow over the last ten years. This ratio has started to recover after a significant decline since 2019, but it is not a strong recovery as one would expect a higher yield if only because of fleet ageing.

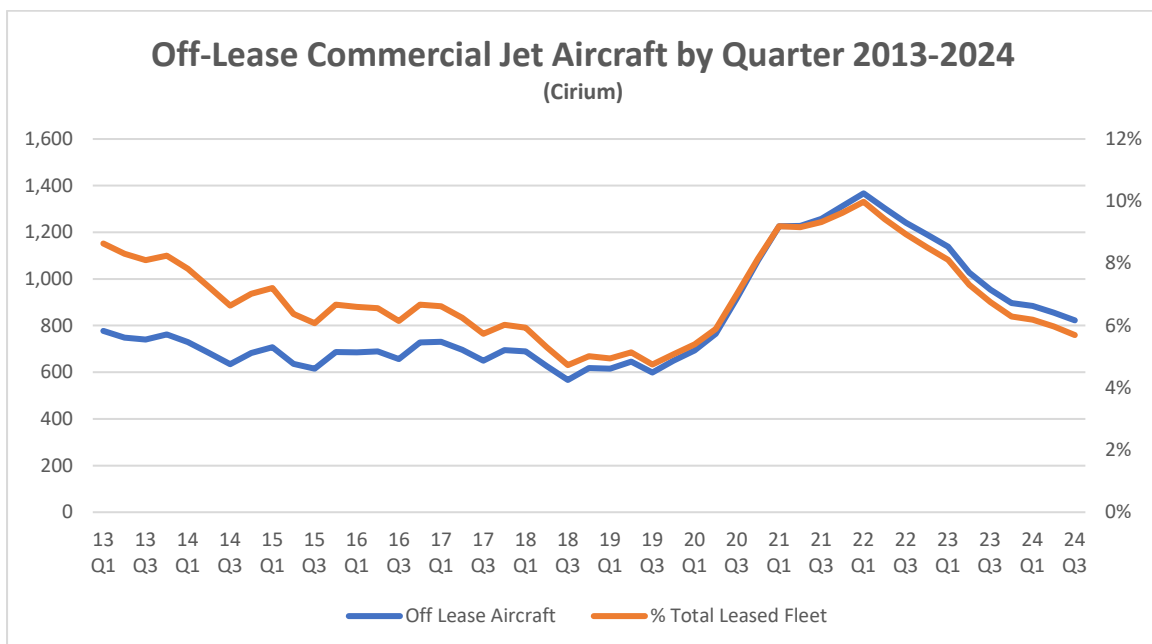


The recovery in yield also needs to be considered in the light of changes in interest costs. Interest expense is a key part of aircraft lessors' cost of sales - they seek to pass on any increases to their airline customers in higher rents and are likely to pass on decreases by way of lower rents due to competitive pressures. One should not expect changes in interest rates to immediately feed through into aircraft lease rates as the relationship between them is more than a little "sticky" and tends to

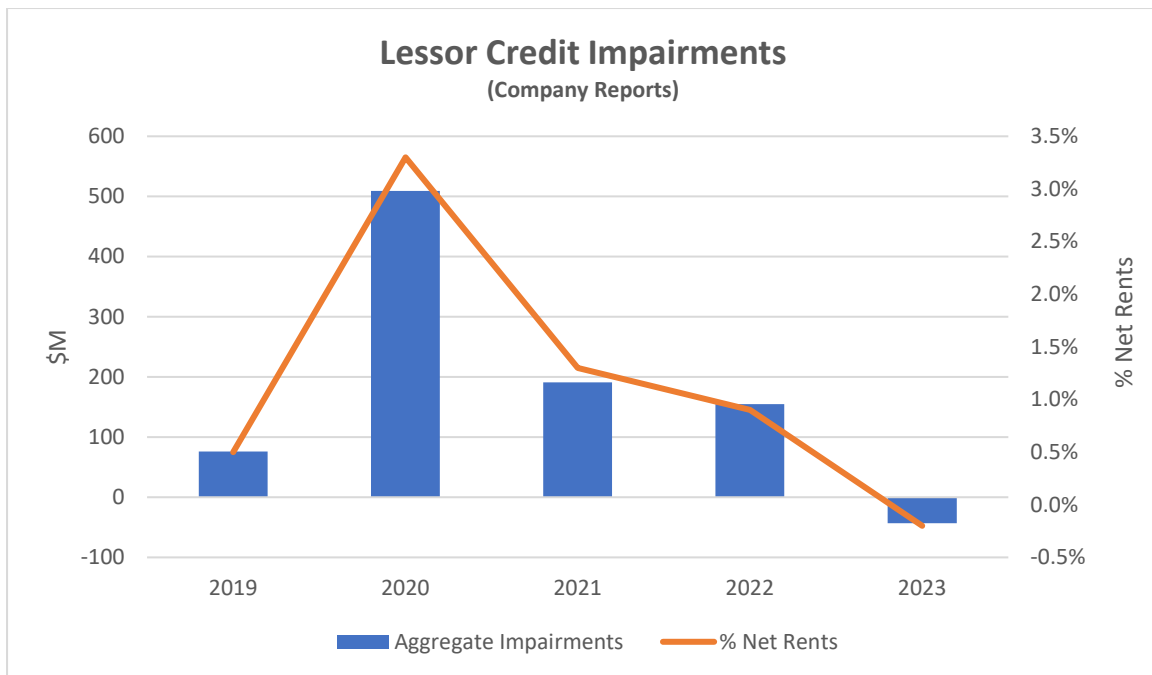
be hard to identify separately from the impact of changes in aircraft supply and demand. Lessors typically have significant medium-term fixed-rate borrowings to hedge their fixed-rate leases, so their cost of debt is relatively stable. Despite these caveats it would be reasonable to expect a greater increase in rents to have occurred in 2023 given the rise in interest rates and the increased age of the fleet.



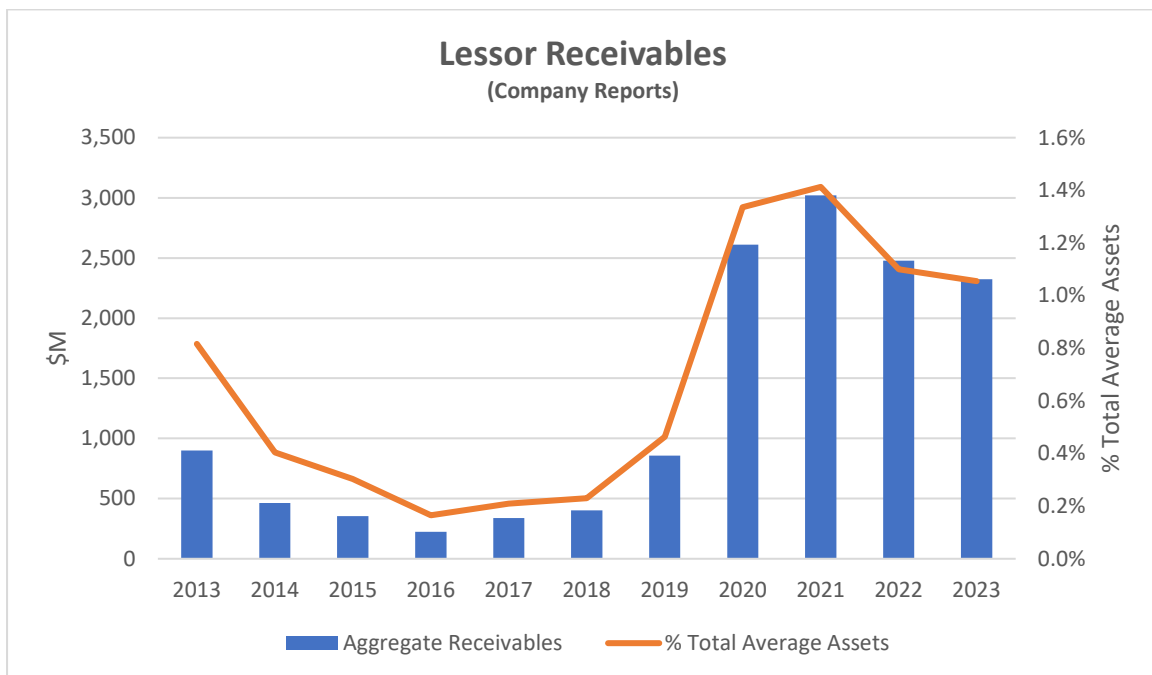
The reason for this muted recovery is unlikely to be high levels of off-lease aircraft as these have declined to relatively normal levels after taking into account fleet ageing since 2019. It should be borne in mind that aircraft out of service due to unscheduled engine maintenance remain on lease and accrue rent. It seems plausible that the slow recovery in rental yield is mainly caused by increased competition in the new aircraft market as lessors continue to pursue asset growth.



The level of credit impairments across the industry went negative in 2023, presumably due to reversals of provisions made in prior years. In most cases this is unlikely to be connected to Russian insurance settlements as most identifiable movements relating to these payments have been taken under the asset impairment heading, but there is plenty of scope for recoveries elsewhere.



Absent future major shocks we would expect these numbers to remain at low levels in future as was the case before 2020. There are several reasons why this is old and the new normal for the industry. The most important is that early lease termination is a common element of managing a delinquent lessee so rent no longer accrues and therefore does not have to be written off. Lessors are rightly very focussed on the integrity of their assets and associated records so physical possession is more important than “running the meter”, especially with a mobile asset that can be redeployed to earn revenue elsewhere.



In contrast the level of receivables across the industry remains at a high level compared to 2019. We define receivables broadly and typically include items such as notes receivable as well as overdue rents as the latter often arise when rents are formally rescheduled. At a little over 1% of total assets this does not represent a major threat to the industry but is perhaps surprising given the recovery in airline profitability after 2021. The slow pace of decline is at least partly attributable to new airline restructurings as some lessors have seen an increase in this balance sheet item.

In the long run aircraft lessor stock prices have outperformed most airlines. The chart below compares the performance of the NYSE Arca Global Airline Index with the three largest public aircraft lessors over 5 years. The lessor stocks have significantly outperformed the airline industry during this period which encompasses both the pandemic and Russia’s invasion of the Ukraine.

Amongst the lessors the most notable development is the outperformance of AerCap. It would be easy to attribute this to the acquisition of GECAS, as AerCap’s earlier acquisition of ILFC saw its share price virtually double when the transaction was announced. However, the GECAS acquisition was announced in early 2021 and the outperformance only started in 2023. Another explanation that does not really make sense is business growth as AerCap’s balance sheet has shrunk since 2021 whereas Air Lease and BOC Aviation have both grown.

Where AerCap really differentiates itself from its comps is through its aggressive programme of share repurchases. From 2016 to 2023 AerCap spent nearly \$6.5 billion buying back its own shares compared to its 2016 market capitalization of \$7.3 billion (its current market capitalization is \$18.8 billion). AerCap’s execution of this strategy has been driven by its ability to consistently sell aircraft at a profit, and it has benefitted shareholders as nearly all its share repurchases were at a discount to book value per share. Even now its share price to BV ratio is only a little over 1:1.

NYSE Arca Global Airline Index vs Major Aircraft Lessors

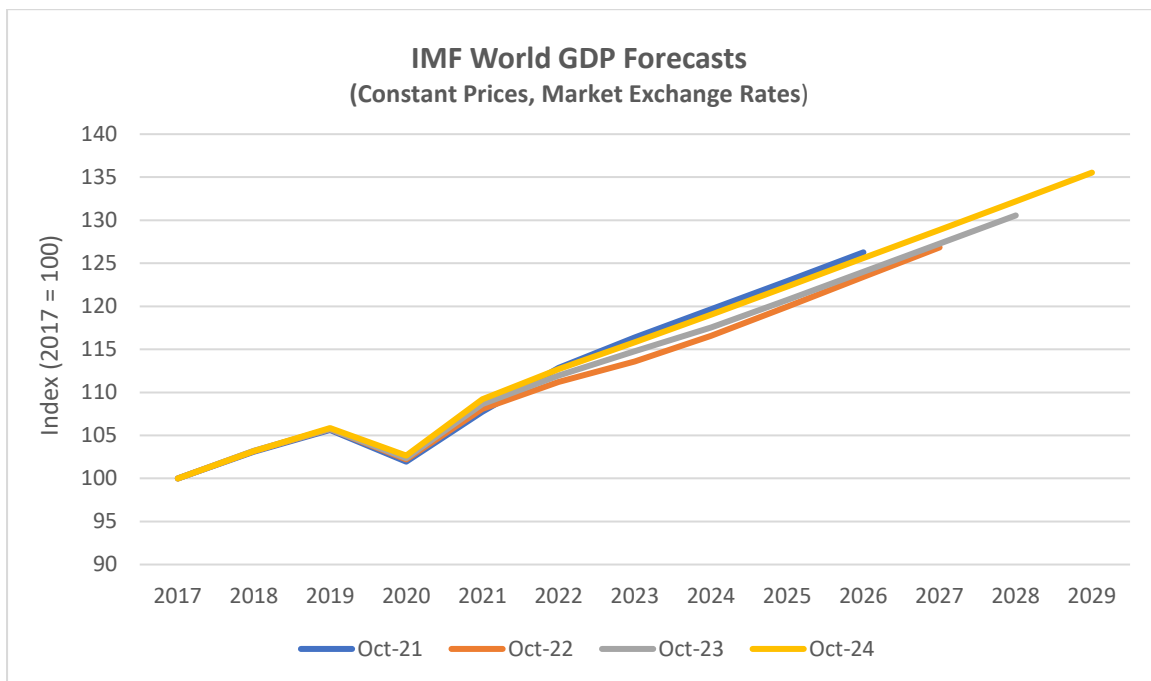
(Google Finance)



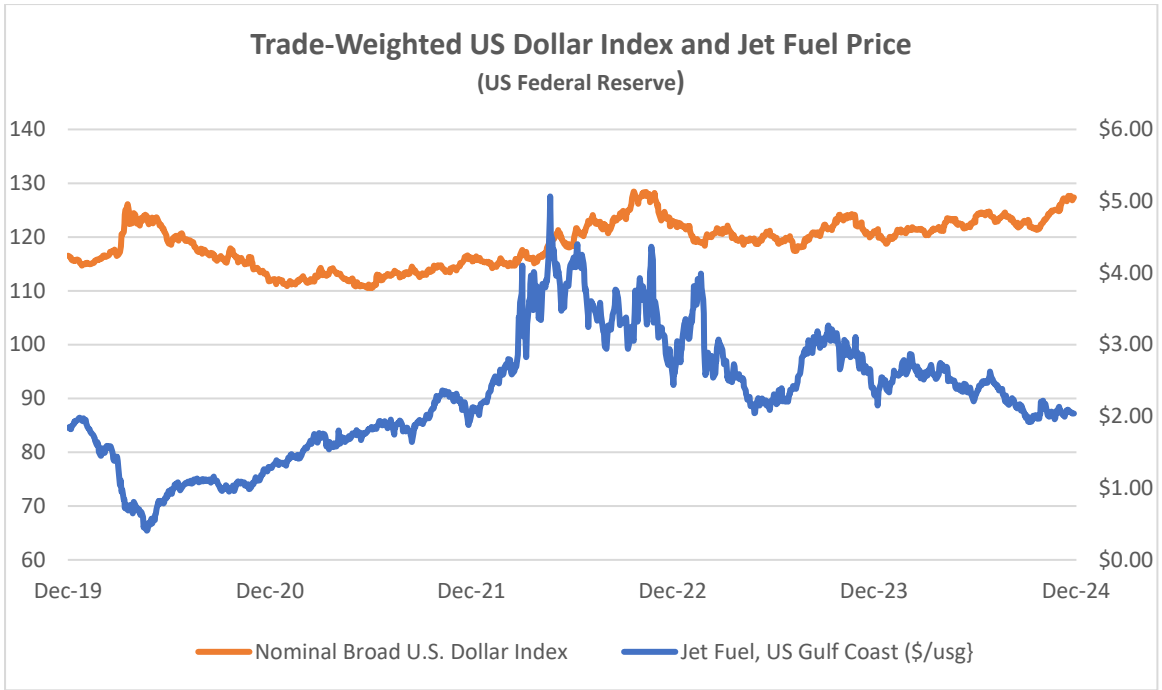
Macro-Economic Background

We have mentioned a few times recently that we want to shift the focus of our discussion of world GDP development from a look back to a look forward perspective. Looking back made a lot of sense in the last few years as this kind of data can be subject to major revisions and it was important to capture the overall impact of the pandemic from 2020 through 2024. Any revisions now are very small, so it is time to move on.

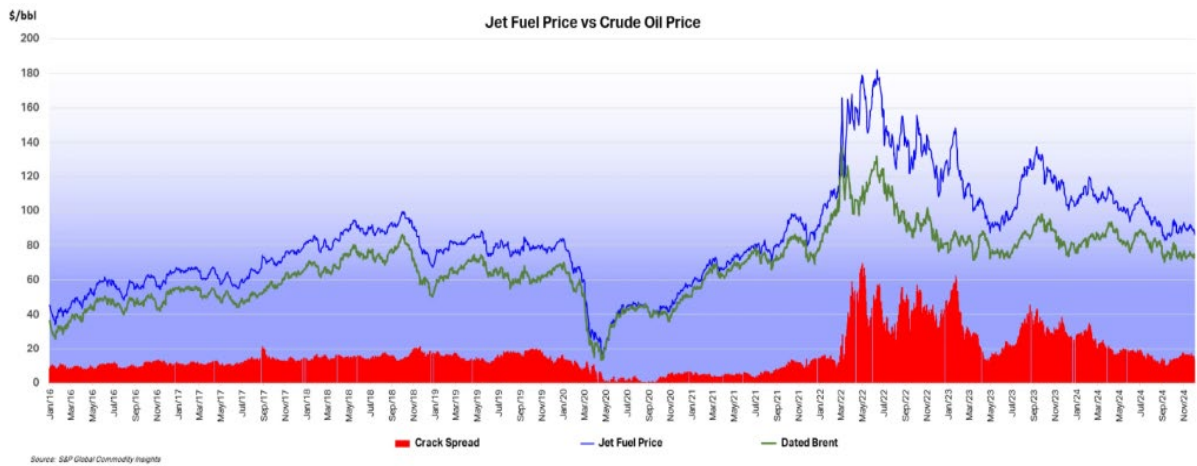
The chart below compares the IMF's forecast for world GDP growth from its October 2024 World Economic Outlook with its three most recent predecessors. The forecast horizon moves forward each year, so it is helpful to create indices that help visualise the rate of change – obviously steeper is better. The 2024 forecast is notably more positive than the previous two years.



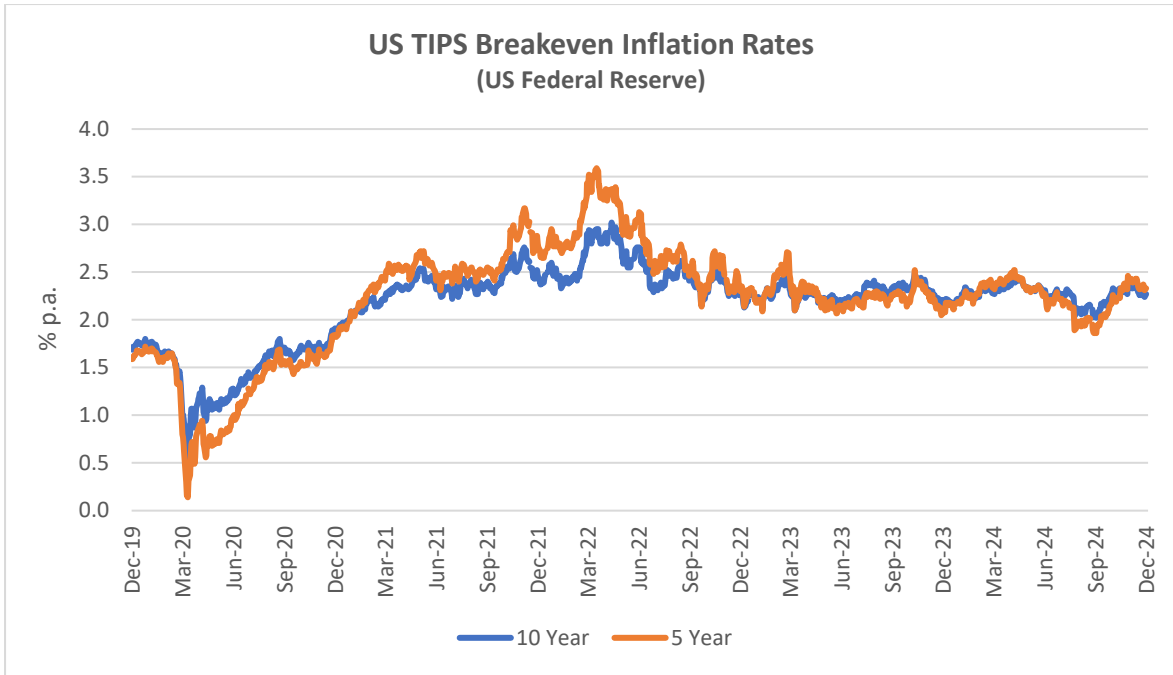
Economic growth is a key driver of long-term growth of air travel. However, since early 2022 its impact has been overshadowed by the fall and recovery in traffic associated with the pandemic. In time the influence of overall economic conditions on air travel is likely to reassert itself, but industry forecasts published by Airbus, Boeing and IATA assume much higher rates of traffic growth than GDP growth over the rest of the 2020s as the former catches up to its long-term trend (see our Q1 2024 Industry Update for a more detailed discussion).



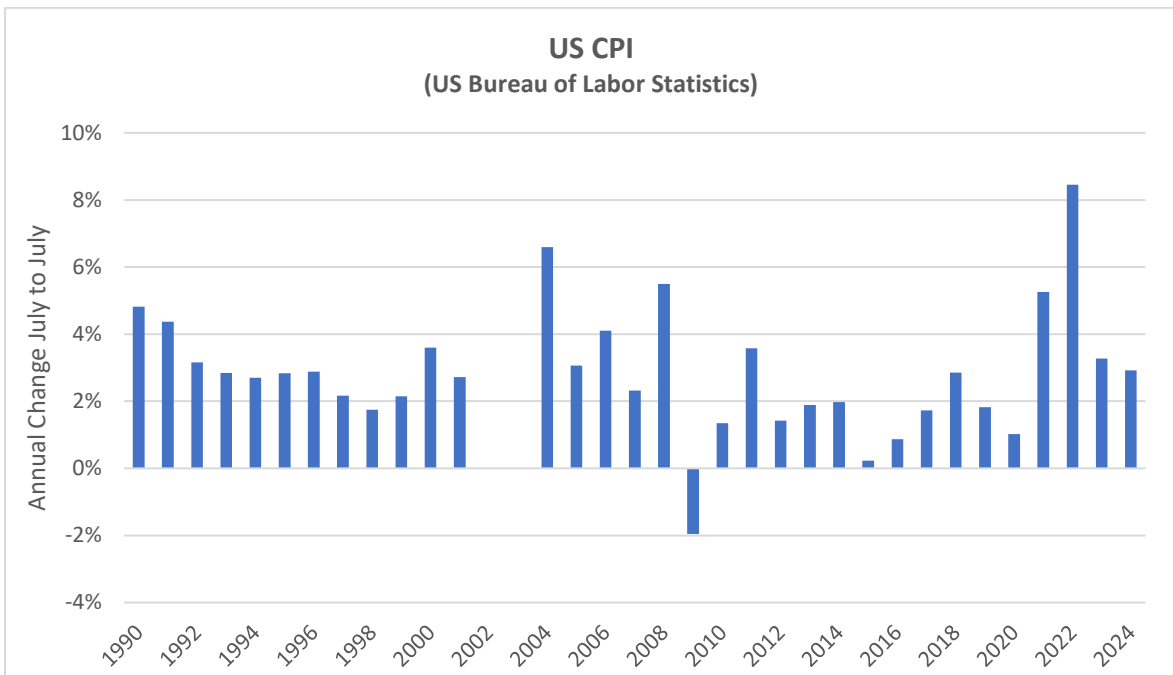
The US Dollar has weakened since its recent peak in September 2022, providing relief for airlines outside the US for dollar-denominated costs such as fuel, aircraft rents and aircraft spares. The price of jet fuel has remained volatile, but it has moderated since February 2024. This reduction has mainly been driven by a reduction in the “crack spread” from c.\$30 to c.\$13.



Another indicator that is potentially important to aircraft investors is the breakeven inflation rate on US Treasury Inflation-Protected Securities (TIPS). This indicator measures inflation expectations and it matters because used aircraft values are strongly influenced by the cost of new aircraft and over time this cost is linked to US Dollar inflation. In the short term this linkage is driven by escalation clauses in aircraft purchase contracts and in the long term by the general input cost environment for the aircraft manufacturers. The chart below compares the breakeven rate for 10-year and 5-year TIPS.

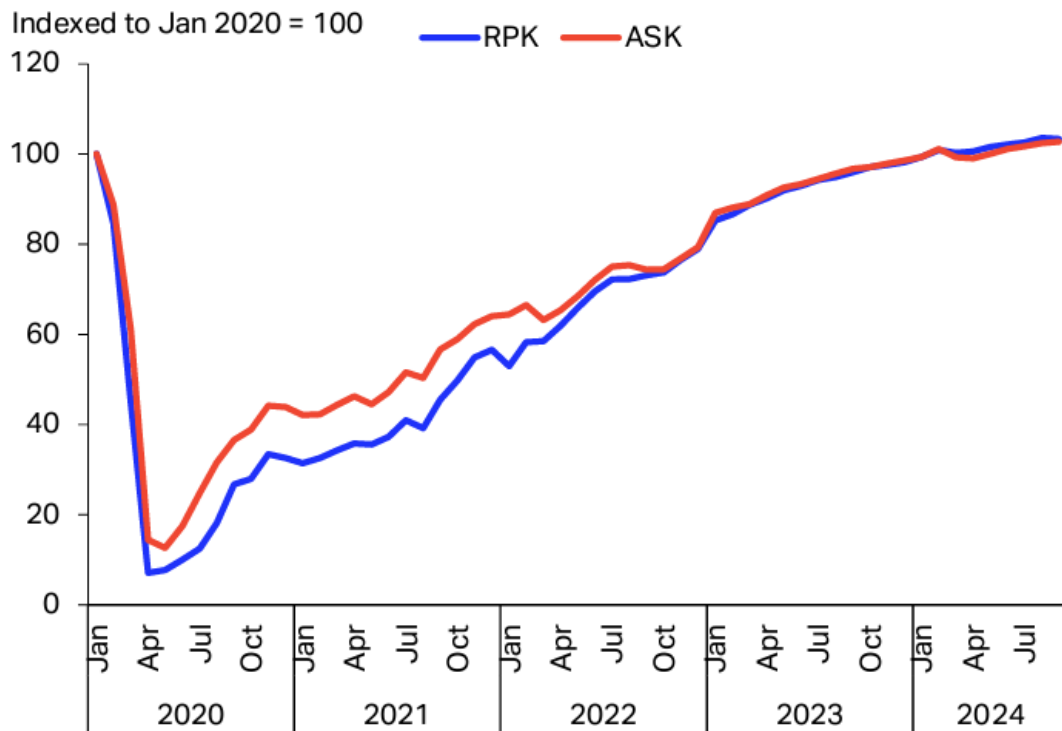


Although medium or long-term inflation expectations have never gone higher than 3.5%, actual inflation experience has been much higher in the last few years. This has led to higher appraised values for new aircraft.



Traffic and Aircraft Demand

Global RPK and ASK, Seasonally Adjusted



Sources: IATA Sustainability and Economics using data from IATA Information and Data - Monthly Statistics

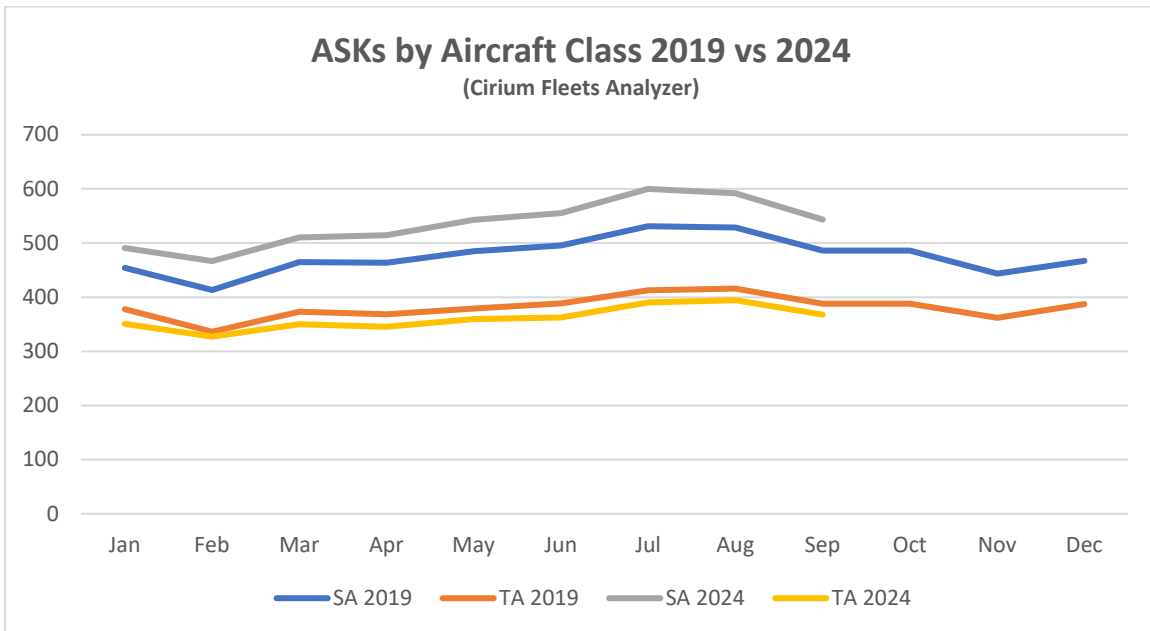
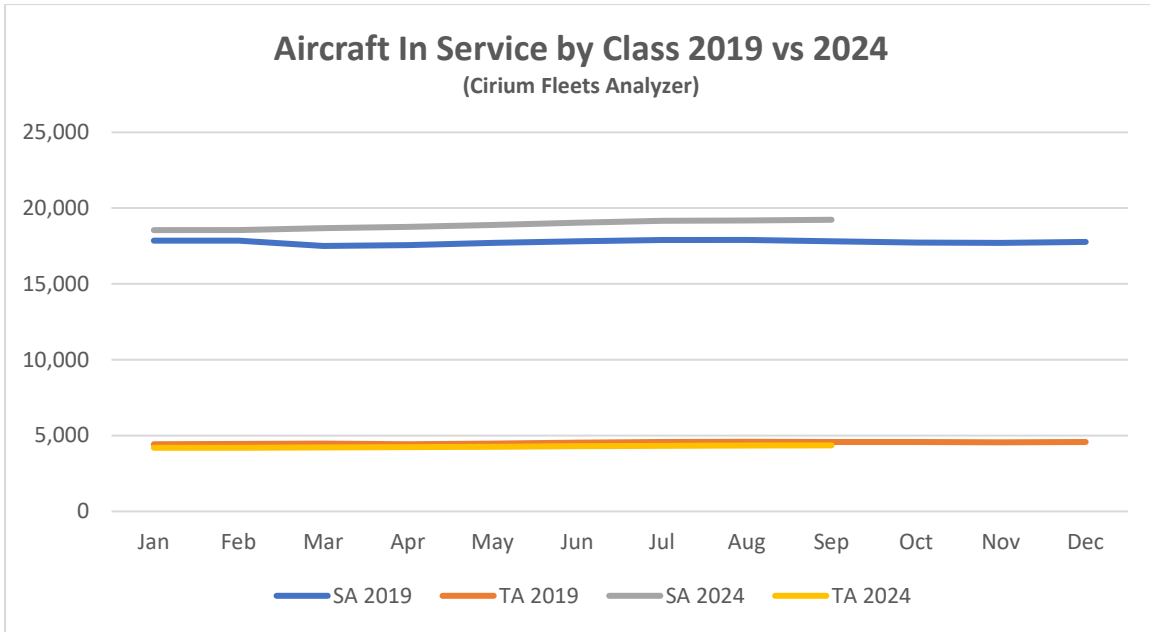
During 2024 RPKs³ have grown slightly faster than ASKs⁴ leading to an improvement in load factor. Year to date RPKs through September 2024 grew 11.3% compared to 2023, broadly in line with IATA's full year forecast of 11.6%.

Total Market 2024 vs 2023 and 2019 – IATA Data (all figures in %)						
	September 2024 vs September 2023			September 2024 vs September 2019		
	RPK Change	Load Factor Change	Load Factor Level (2023)	RPK Change	Load Factor Change	Load Factor Level (2019)
World	7.1	1.0	83.6	4.2	1.0	82.6
Africa	12.2	3.6	76.5	7.0	3.4	73.1
Asia-Pacific	12.4	3.2	83.1	1.0	3.1	80.0
Europe	6.7	0.3	86.5	2.9	0.5	86.0
Latin America	7.2	-0.3	83.4	12.2	-0.5	83.9
Middle East	4.7	0.0	81.4	10.1	-0.2	81.6
North America	1.1	-0.9	82.4	6.6	-0.6	83.0

International Markets 2024 vs 2023 and 2019 – IATA Data (all figures in %)						
	September 2024 vs September 2023			September 2024 vs September 2019		
	RPK Change	Load Factor Change	Load Factor Level (2023)	RPK Change	Load Factor Change	Load Factor Level (2019)
World	9.2	0.1	85.0	1.7	1.2	83.8
Africa	11.9	3.6	77.0	5.3	4.4	72.6
Asia-Pacific	18.5	0.5	83.0	-5.6	0.5	82.5
Europe	7.6	0.2	87.4	1.1	1.9	85.5
Latin America	12.4	-1.1	85.1	14.6	-0.7	85.8
Middle East	4.4	-0.1	79.7	9.9	-2.1	81.8
North America	0.5	-1.1	88.7	5.8	3.1	85.6

Select Domestic Markets 2024 vs 2023 and 2019 – IATA Data (all figures in %)						
	September 2024 vs September 2023			September 2024 vs September 2019		
	RPK Change	Load Factor Change	Load Factor Level (2023)	RPK Change	Load Factor Change	Load Factor Level (2019)
World	3.7	2.4	83.3	8.9	2.6	80.7
Australia	1.5	1.8	86.3	4.6	1.6	84.7
Brazil	6.4	1.4	82.8	7.2	1.4	81.4
China	7.7	7.4	84.2	16.4	7.5	76.7
India	6.5	-2.4	83.1	12.6	-1.6	84.7
Japan	6.7	5.9	81.7	-3.5	6.8	74.9
US	1.6	-0.6	81.3	7.8	0.0	81.3

Although some short-haul aircraft serve international routes nearly all long-haul aircraft do so, and this is reflected in the relative demand for single-aisle (narrowbody) and twin-aisle (widebody) aircraft. Aircraft demand can be measured in terms of aircraft in service and ASKs, the standard measure of aircraft capacity deployed by airlines which indicates how intensively aircraft are being flown. Single aisle aircraft demand on both metrics is higher so far in 2024 than in 2019 whereas twin-aisle aircraft are marginally weaker by aircraft in service and lagging more in terms of ASKs. The difference between the two metrics may be down to the gradual move away from very large aircraft such as the B747 and A380 towards the smaller B787 and nA350, resulting in fewer ASKs per aircraft unit. It is hard to see the TA 2024 data series because it is only very marginally lower than TA 2019.



Full recovery has yet to be achieved for twin-aisle aircraft, mainly due to weak traffic to and from, and within the Asia-Pacific region. The figures by region in the tables above are based on airline domicile, so weak Europe to Asia traffic reduces recorded international RPKs in other regions. Twin-aisle aircraft in service has shown a greater improvement relative to 2019 than ASKs which suggests that aircraft are being returned to service with lower utilisation in anticipation of continued recovery.

New Aircraft Supply

Airbus Deliveries		Nine Months to September					
Aircraft Family	2018	2019	2020	2021	2022	2023	2024
A220	21	33	18	34	34	41	45
A320	395	422	282	341	340	391	396
A330	31	34	9	11	21	20	20
A350	61	77	31	36	42	36	36
A380	8	5	-	2	-	-	-
Total	516	571	340	424	437	488	497

Airbus continues to guide total deliveries for 2024 at 770 commercial jets compared to 735 in 2023 although deliveries for the first nine months were only slightly higher at 497 vs 488. Chief executive Guillaume Faury stated during the 9 months Airbus results announcement that “We are struggling with more pragmatic issues as we speak now in 2024 for reaching the 770 (target)”. Single-aisle engines, cabin equipment and aerostructures are the main supply chain bottlenecks. On a more positive note, the first A321XLR delivered to Iberia at the end of October.

The latest announced status of Airbus’s production plans is:

Aircraft Family	Current Announced Monthly Rate ⁵	Actual 2024 Monthly Rate (9M)	Target Rate	Target Timeframe
A220	6	5.2	14	2026
A320	50	45.9	75	2027
A330	4	2.2	4	2024
A350	6	4.0	12	2028

Previously announced production plans included an interim target for A320 production of 65 per month but this was not mentioned as part of the most recent update. Although actual production rates to date are below current announced production rates Airbus normally delivers most aircraft in the fourth quarter, so they are likely to catch up by year end for most types.

Boeing Deliveries		Nine Months to September					
Aircraft Family	2018	2019	2020	2021	2022	2023	2024
B737	407	118	12	179	277	286	229
B747	5	5	2	4	3	1	-
B767	13	32	20	24	21	17	15
B777	37	33	15	20	18	17	11
B787	106	113	49	14	9	50	36
Total	568	301	98	241	328	371	291

Boeing suffered another disruption to its aircraft production activity when its machinists went on strike in September. There are reports that 737 Max production restarted in early December after the strike was resolved in November, although Boeing has not confirmed this. At the end of Q3 Boeing held an inventory of 60 B737-8 aircraft produced prior to 2023 compared to 175 at the start of the year, plus 35 -7 and -10 variants awaiting certification. B787 production has also been hit by the strike as well as supply chain problems and rework requirements. Inventory reduced from 50 at

the start of the year to 30 at the end of Q3. The inventory reductions show that Boeing is struggling to deliver “new build” aircraft so far this year.

Boeing has stopped providing official production guidance. Its long-term target for B737 production is 56 per month but this is clearly several years away, and, in the meantime, production is capped at 38 a month by the FAA until it is happy that the manufacturer has resolved the quality control lapses that caused the door panel of an Alaska Airlines B737-9 to detach in flight last January. Several analysts have written that production will be at very low levels for some time. B787 production will also take time to build back towards Boeing’s target of 5 per month.

Boeing has also pushed back target entry into service dates for its new B777 models with B777-9 EIS now 2026, B777-8F 2028 and B777-8 2030.

The number of commercial jets delivered by OEMs other than Airbus and Boeing remains subdued. COMAC of China achieved a significant increase in ARJ 21 and C919 deliveries and slightly ahead of 2023.

Other Jet Deliveries		Nine Months to September					
Aircraft Type	2018	2019	2020	2021	2022	2023	2024
ARJ 21	3	8	12	17	13	12	25
C919	-	-	-	-	-	1	7
CRJ 700/900/1000	15	18	11	3	-	-	-
E-Jet/ E-Jet E2	60	57	18	32	27	40	42
Superjet 100	27	4	6	11	5	3	1
Total	105	87	47	63	45	56	75

Airline Industry Financial Performance

NYSE Arca Global Airline Index vs S&P Global 1200 Index

(Google Finance)



NYSE Arca Global ...	1,384.14	+235.04	↑ 20.45%
S&P Global 1200	4,173.26	+716.00	↑ 20.71%

Airline shares have caught up with the broader stock market with a very strong Q4 so far. This is mainly due to strong performance by the US network airlines (United in particular) on the back of strong premium travel demand and moderating fuel prices.

Ironically enough November also saw the largest airline bankruptcy of 2024 when Spirit Airlines filed for Ch. 11. Along with other US low-cost airlines Spirit has suffered from a switch in US passenger demand towards international travel and more effective competition from the large network airlines. It has also had to deal with the need to ground a significant proportion of its fleet due to unscheduled maintenance on its Pratt & Whitney GTF engines. It reflects the strength of aircraft demand that Spirit management have said their bankruptcy restructuring objectives relate only to their obligations to shareholders and bondholders rather than lessors and other financiers.

The other large airline failure this year occurred when GOL of Brazil filed for US bankruptcy protection in January. This was not a major surprise as GOL's major competitors Avianca and LATAM had already done so during the pandemic and GOL had engaged in significant financial restructuring in the same timeframe.

Airline Failures in 2024 (various sources)				
Airline	Country	Month	Aircraft Types	# Aircraft⁶
GOL	Brazil	January	B737-700, B737-800, B737-8	143
Fly Arna	Armenia	January	A320-200	1
LIAT	Antigua & Barbuda	January	ATR42-600	3
Humo Air	Uzbekistan	February	A320-200	2
Lynx Air	Canada	February	B737-8, DHC-6-300	10
Pacific Airlines	Vietnam	March	A320-200	11
Bonza	Australia	April	B737-8	5
Bluebird Nordic	Iceland	April	B737-400F, B737-800F, B777-300ER	11
Air Vanuatu	Vanuatu	May	B737-800, ATR72, DHC-6-300, BN-2	6
Jet Air	Curacao	June	F70	1
Regional Expr.	Australia	July	Saab 340	37
Lanmei Airlines	Cambodia	August	A320-200	1
Jetlines	Canada	August	A320-200	3
FlyEgypt	Egypt	October	B737-800	3
Spirit Airlines	United States	November	A319-100, A320-200, A321-200, A320 Neo, A321 Neo	205

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¹ Sirius has created the time series of aggregate aircraft leasing industry returns by based on public financial information in respect of the following companies: AerCap, Airastle, Air Lease Corp., ALAFCO, Aviation Capital Group, Avolon, AWAS, BOC Aviation, CDB Aviation, DAE Capital, Fly Leasing, GECAS, Genesis Lease, ILFC, Intrepid/Voyager, Nordic Aviation Capital and SMBC Aviation Capital. We have excluded NAC from our calculations for 2022 because their net income includes a \$2.6 BN gain on restructuring of financial liabilities and some other large one-off items.

² For the purposes of calculating net rental yield we include assets such as maintenance rights and lease premiums in aircraft book value as both these items are allocations of amounts paid for used aircraft and their exclusion would inflate net lease yield compared to aircraft bought new. We have excluded ALAFCO and NAC from these calculations

- ALAFCO has been subject to an orderly wind-down in recent years and this has made this ratio very volatile due to the timing of aircraft sales.
- NAC's bankruptcy involved very substantial aircraft impairments relative to its total aircraft book value which have distorted this ratio.

³ RPKs is the acronym for revenue passenger kilometres, which is the product of the number of paying passengers times distance flown.

⁴ ASKs is the acronym for available seat kilometres, which is the product of the number of available seats flown times distance flown.

⁵ Airbus normally quotes its production rates based on an 11.5-month year for single-aisle aircraft.

⁶ Fleet numbers are as of December 31st, 2023.