

Sirius Aviation Capital

Air Transport Industry Update Q4 2021

- Macro-Economic Background
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- Airline Industry Financial Performance
- **Special Topic – Aircraft Leasing Industry Consolidation**

Macro-Economic Background

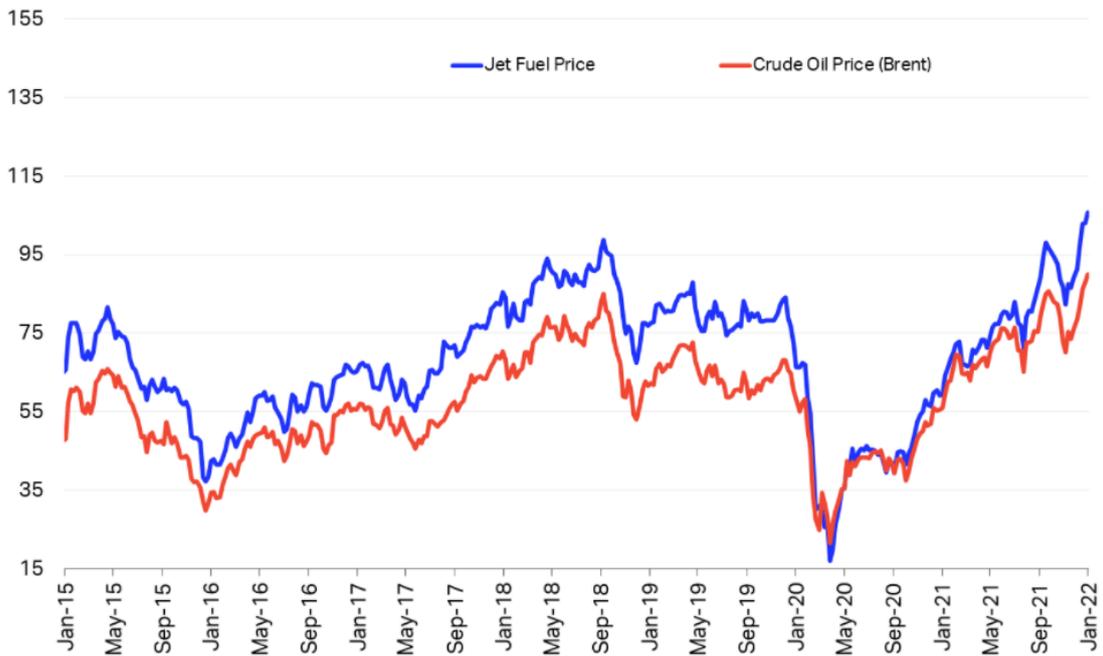
The tone of the IMF’s latest world economic forecast is rather downbeat. The headline reads “Rising Caseloads, a Disrupted Recovery, and Higher Inflation”. However, their revised forecast shows no material change in the overall four-year compound annual growth rate from 2020 to 2023, with reductions in 2021 and 2022 being offset by a stronger recovery in 2023. The increase in general inflation may present an opportunity for airlines to pass on some increased costs such as higher fuel prices

IMF World GDP Forecasts (Constant Prices, Market Exchange Rates)					
Forecast Date	2020	2021	2022	2023	4 Year CAGR
October 2021	-3.5%	5.7%	4.7%	3.1%	2.4%
January 2022	-3.5%	5.6%	4.2%	3.4%	2.4%

The price of jet fuel continued to increase in Q4 2021, driven by the increase in the price of crude oil and by the return of the “crack spread”¹ to more normal historical levels. Today’s price is a little higher than in 2018, which was a good year for the airline industry, so the current price is not an existential threat. However, it will reduce the airlines’ financial flexibility and at the margin will encourage them to prioritize profit margins over traffic growth as it will increase their break-even load factor.

¹ The crack spread is the difference between the price of crude oil and the fuel products extracted from it.

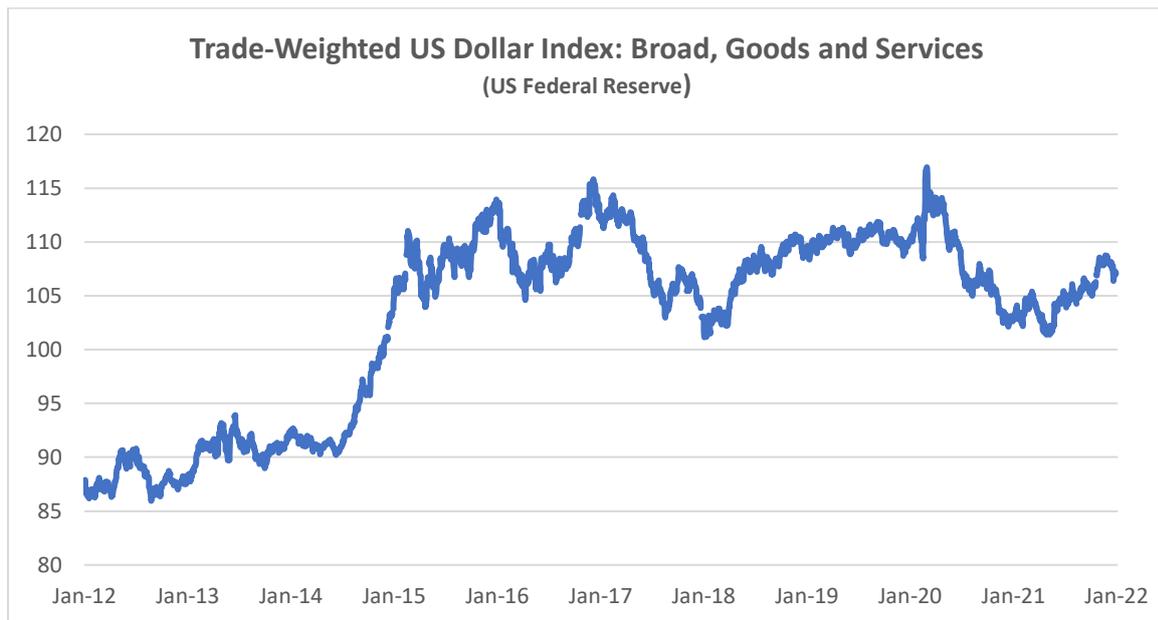
Jet Fuel & Crude Oil Price (\$/barrel)



Source: Platts, Datastream

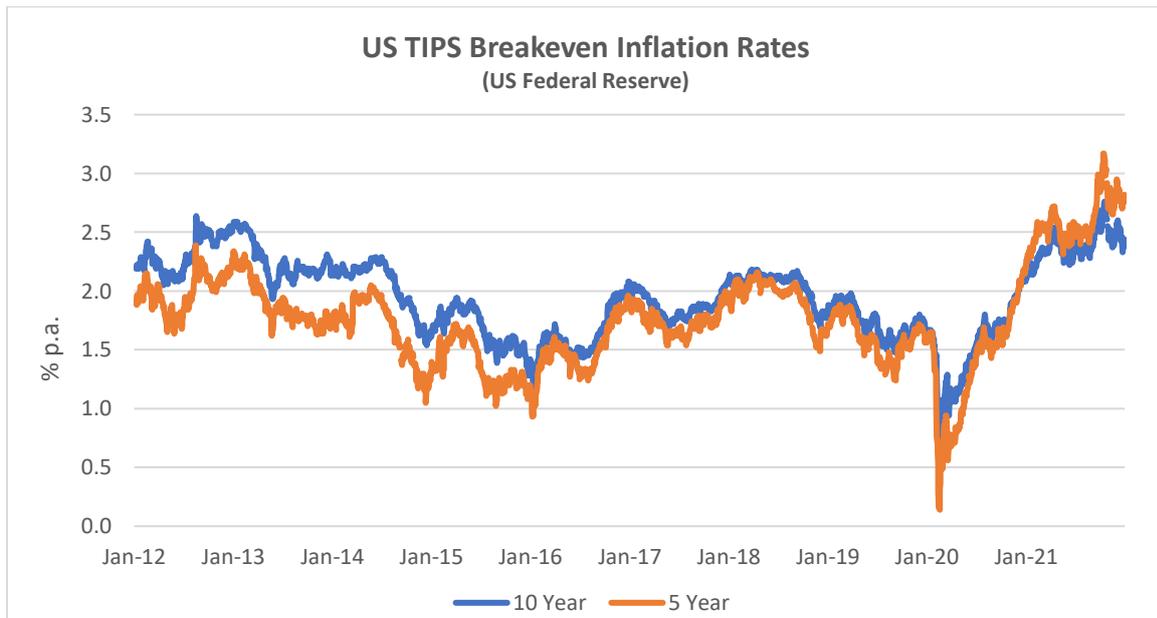
(IATA Jet Fuel Price Monitor November 2021)

For airlines outside of the US this negative continues to be offset by a weaker US Dollar. This is a very important factor in airline financial performance because so many airline costs are typically US Dollar-denominated – not just fuel but also aircraft rents, debt service, aircraft, and spare parts.



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. For this report we have compared the breakeven rate for 10-year and 5-

year TIPS to highlight the differences in expectations for the two time horizons. The shorter time horizon has been more volatile, especially since the onset of the pandemic, but there is a strong overall correlation that suggests changed inflation expectations are not for a transitory “blip”.



Traffic and Aircraft Demand

Recovery from the impact of COVID-19 remains slow and patchy. Global RPKs² for calendar year 2021 were down 58% vs 2019 compared to a 60% drop for the nine months to September. As the tables below make clear domestic traffic continues to outperform international by a large margin due to the greater impact of government restrictions on the latter.

Total Market 2021 vs 2019 – IATA Data						
	Month of December			2021 Calendar Year		
	RPK Change	Load Factor Change	Load Factor Level	RPK Change	Load Factor Change	Load Factor Level
World	-45.1	-9.8	72.3	-58.4	-15.4	67.2
Africa	-57.1	-7.6	64.7	-62.8	-12.3	59.5
Asia-Pacific	-65.6	-19.1	62.5	-66.9	-19.2	62.6
Europe	-37.4	-8.5	74.5	-61.3	-16.6	68.6
Latin America	-22.8	-0.7	81.6	-47.4	-5.2	77.3
Middle East	-49.6	-11.0	66.3	-69.9	-24.6	51.5
North America	-22.9	-6.1	79.3	-39.0	-11.0	73.8

² RPKs is the acronym for revenue passenger kilometres which is the product of the number of passengers flown and distance flown.

Domestic Markets 2021 vs 2019 – IATA Data

	Month of December			2021 Calendar Year		
	RPK Change	Load Factor Change	Load Factor Level	RPK Change	Load Factor Change	Load Factor Level
World	-22.4	-7.2	75.7	-28.2	-9.3	74.3
Australia	-60.4	-31.4	51.5	-62.4	-19.6	61.2
Brazil	-3.8	-1.7	82.3	-27.2	-2.3	80.4
China	-39.6	-18.4	63.4	-24.4	-14.4	70.2
India	-12.8	-8.4	79.8	-41.8	-15.9	71.4
Japan	-25.9	-9.1	60.7	-57.9	-23.4	50.4
Russia	23.2	9.4	87.6	24.2	3.4	86.5
US	-13.1	-9.0	82.0	-23.8	-7.3	78.0

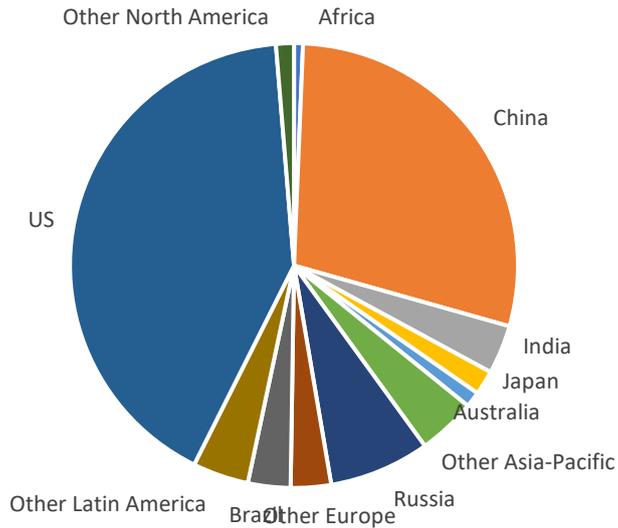
International Markets 2021 vs 2019 – IATA Data

	Month of December			2021 Calendar Year		
	RPK Change	Load Factor Change	Load Factor Level	RPK Change	Load Factor Change	Load Factor Level
World	-58.4	-12.8	68.9	-75.5	-24.0	58.0
Africa	-60.5	-8.9	63.3	-65.2	-14.1	57.3
Asia-Pacific	-87.5	-31.4	50.4	-93.2	-44.3	36.5
Europe	-41.5	-10.3	73.4	-67.6	-20.6	65.0
Latin America	-40.4	-0.6	81.3	-66.9	-10.2	72.6
Middle East	-51.2	-11.4	66.0	-71.6	-25.1	51.1
North America	-41.7	-12.5	72.2	-65.6	-23.8	60.2

IATA reports changes in traffic and global market shares rather than actual values and reports domestic traffic on a different basis to international traffic by focusing on country rather than regional markets. The country focus becomes more understandable when one considers the 85% total domestic traffic accounted for by the seven countries listed separately.

Domestic Markets Share of World RPKs in 2021

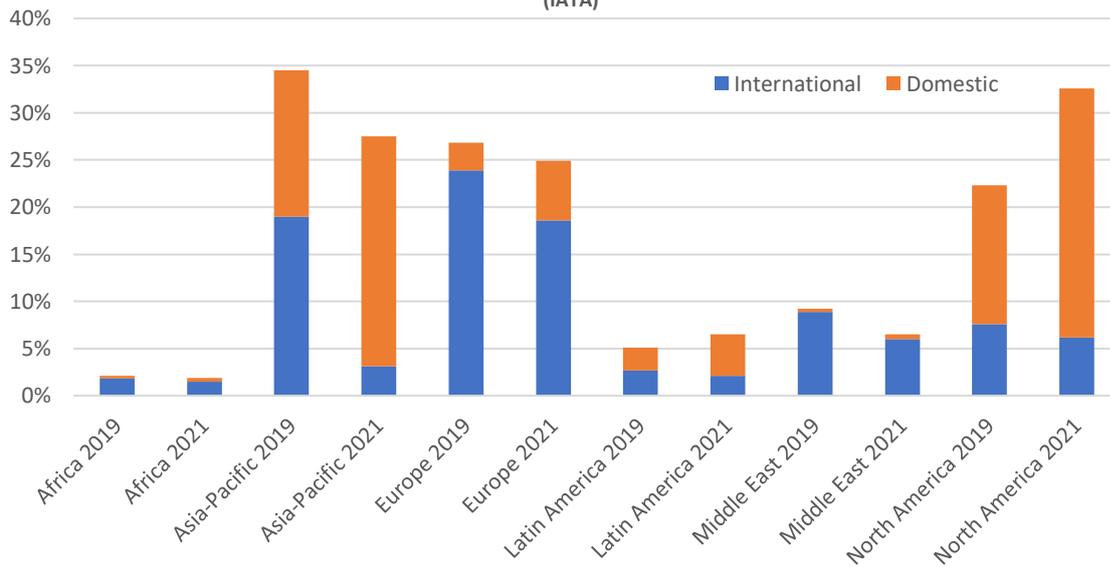
(IATA)



Although the breakdown of domestic traffic in 2021 looks similar to 2019, this is not true of the split between domestic and international traffic by region. Although domestic traffic has an increased share everywhere, the change is most dramatic in the Asia-Pacific region where international traffic has collapsed, and domestic Chinese traffic is most of what's left.

World RPK Shares 2021 vs 2019

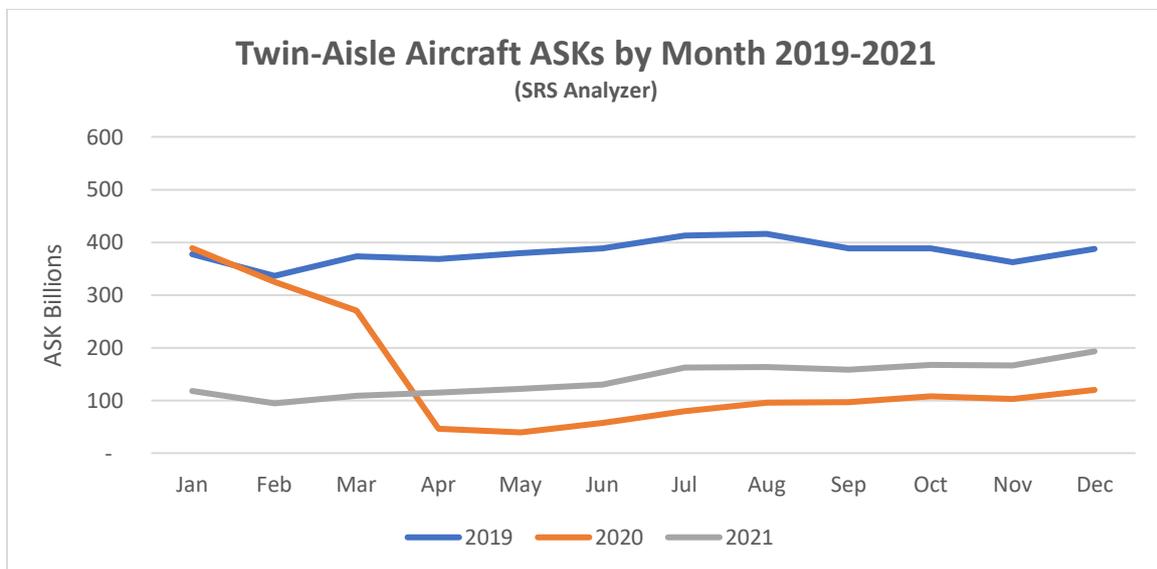
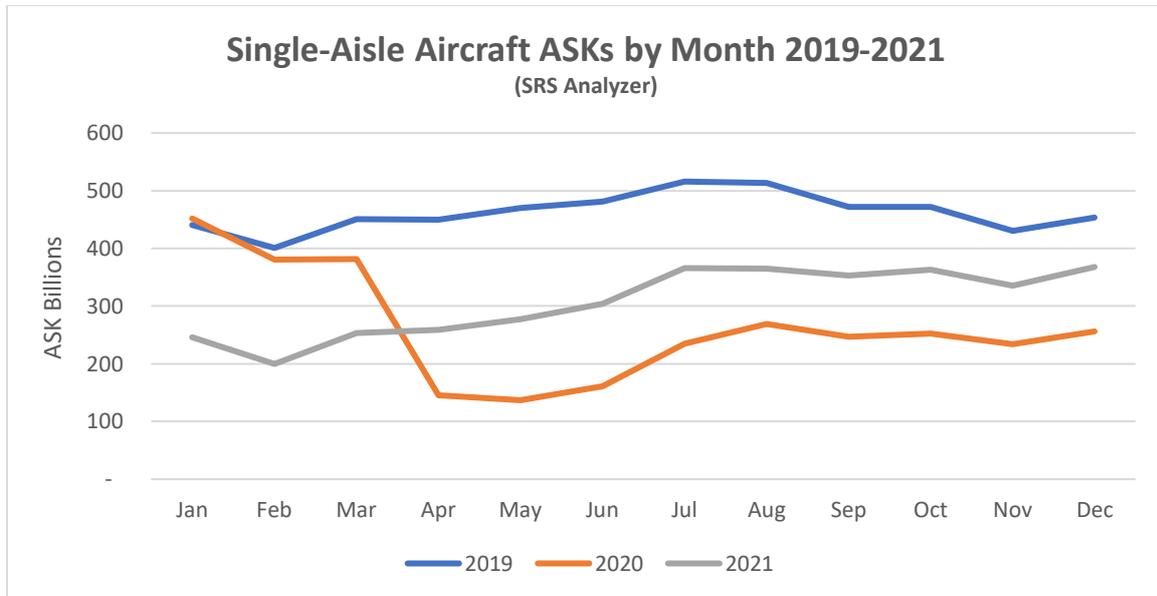
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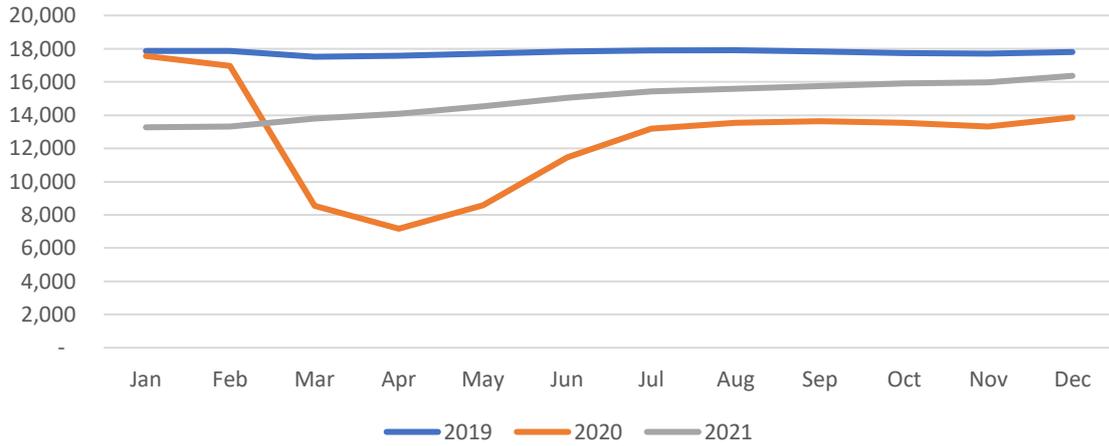
Although some short-haul aircraft serve international routes nearly all long-haul aircraft do so, and this is reflected in the relative demand for single-aisle (narrowbody) and twin-aisle (widebody) aircraft. Aircraft demand can be measured in terms of ASKs³ and aircraft in service. ASKs have not declined as much as traffic because load factors have declined and aircraft in service have not

³ ASKs is the acronym for available seat kilometres, which is the product of the number of seats flown and distance flown. This is the basic measure of airline industry capacity.

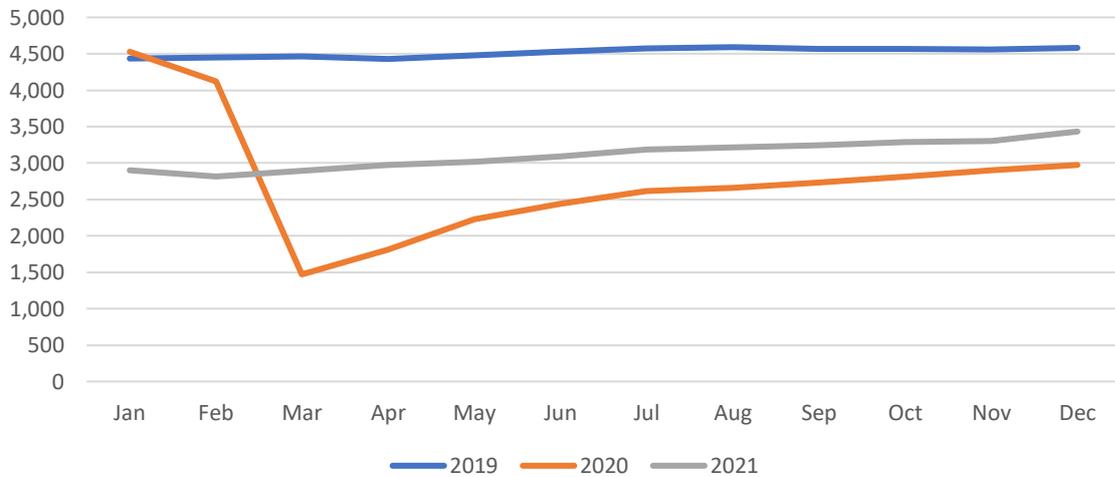
declined as much as ASKs because aircraft utilization has declined. The airlines are clearly sweating their assets more since the middle of 2021 as the rates of growth in both ASKs and aircraft in service have both declined. This is probably due to a more stable market environment and the need to address rising fuel prices with greater asset productivity.



Single-Aisle Aircraft in Service 2019-2021 (Cirium Fleets Analyzer)



Twin-Aisle Aircraft in Service 2019-2021 (Cirium Fleets Analyzer)



New Aircraft Supply

Airbus Deliveries		Calendar Year			
Aircraft Family	2018	2019	2020	2021	
A220	33	48	38	50	
A320	626	642	446	483	
A330	49	53	19	18	
A350	93	112	59	55	
A380	12	8	4	5	
Total	813	863	566	611	

The latest status of Airbus's production plans is:

Aircraft Family	Current Announced Monthly Rate ⁴	Actual 2021 Monthly Rate	Target Rate	Target Timeframe
A220	5	4.3	6	Early 2022
A320	45	42.0	65	Summer 2023
A330	2	1.6	3	End of 2022
A350	5	5.0	6	Autumn 2022

Airbus is reported to have received objections from some of its major lessor customers after announcing that it is considering an increase in A320 family production to 75 aircraft per month in 2025. It is also believed that key members of its supply chain such as some engine manufacturers are not enthusiastic. One might speculate that Airbus is testing the waters with some of its key stakeholders and signalling that intends to maintain its lead in the single-aisle aircraft market.

Boeing Deliveries		Calendar Year			
Aircraft Family	2018	2019	2020	2021	
B737	580	127	43	263	
B747	6	7	5	7	
B767	27	43	30	32	
B777	48	45	26	24	
B787	145	158	53	14	
Total	806	380	157	340	

The latest status of Boeing's production plans is:

Aircraft Family	Current Announced Monthly Rate	Actual 2021 Monthly Rate	Target Rate	Target Timeframe
B737	26	14.4	31	Early 2022
B747	0.5	0.6	-	-
B767	3	2.7	-	-
B777	2	2	3	2022
B787	2	1.2	5	-

⁴ Airbus normally quotes its production rates based on an 11.5-month year for single-aisle aircraft and an 11-month year for twin-aisle aircraft.

Boeing's inventory of undelivered B737 Max aircraft fell from 425 at the end of 2020 to 335 in 2021. This lower inventory includes aircraft manufactured since Boeing resumed production in late 2020. This is probably due to a combination of delivery bottlenecks and delays in recertification in some jurisdictions, notably China. Inventory is expected to clear by 2023. Boeing is producing 26 aircraft per month and says it is on track to meet its target of 31 aircraft per month in early 2022. Management is considering further production increases but are wary of potential supply chain issues and expects to deliver 500 B737 Max aircraft in 2022.

Boeing has also had quality and production problems with the B787, its main passenger twin-aisle product (nearly all B747, B767 and B777 deliveries are freighters or tankers) and has suspended deliveries. At the end of 2021 Boeing had 110 B787s in inventory, up from 80 in 2020. Deliveries are expected to resume in 2022 but there is no firm guidance on timing.

There has been no significant change in production levels of other aircraft manufacturers apart from the winding down of the CRJ programme.

Other Jet Deliveries		Calendar Year			
Aircraft Type	2018	2019	2020	2021	
ARJ 21	6	12	23	21	
CRJ 700/900/1000	20	26	17	3	
E-Jet/ E-Jet E2	94	96	47	48	
Superjet 100	28	6	18	25	
Total	148	140	105	97	

Airline Industry Financial Performance

IATA's October 2021 forecast shows the airline industry returning to a near breakeven in 2022 after another very difficult year in 2021. North America is set to be the first region to move back into profit and Europe is forecast to be the next best performer on an EBIT Margin basis. Europe's relative performance is much better than in 2021 due to positive impacts of its Covid passport scheme and the re-opening of North Atlantic travel.

IATA Financial Forecast (October 2021)								
	EBIT Margin (%)				Net Profit (USD BN)			
	2019	2020	2021 (E)	2022 (F)	2019	2020	2021 (E)	2022 (F)
World	5.2	-38.0	-11.0	-2.7	26.4	-137.7	-51.8	-11.6
Africa	1.0	-22.0	-13.0	-9.9	-0.3	-2.2	-1.9	-1.5
Asia-Pacific	3.7	-28.0	-14.0	-9.1	4.9	-45.6	-11.2	-2.4
Europe	4.8	-32.0	-17.0	-5.9	6.5	-34.5	-20.9	-9.2
Latin America	2.9	-34.0	-18.0	-9.7	-0.7	-11.9	-5.6	-3.7
Middle East	-5.2	-21.0	-18.0	-9.6	-1.5	-8.5	-6.8	-4.6
North America	9.6	-32.0	-5.2	4.8	17.4	-35.1	-5.5	9.9

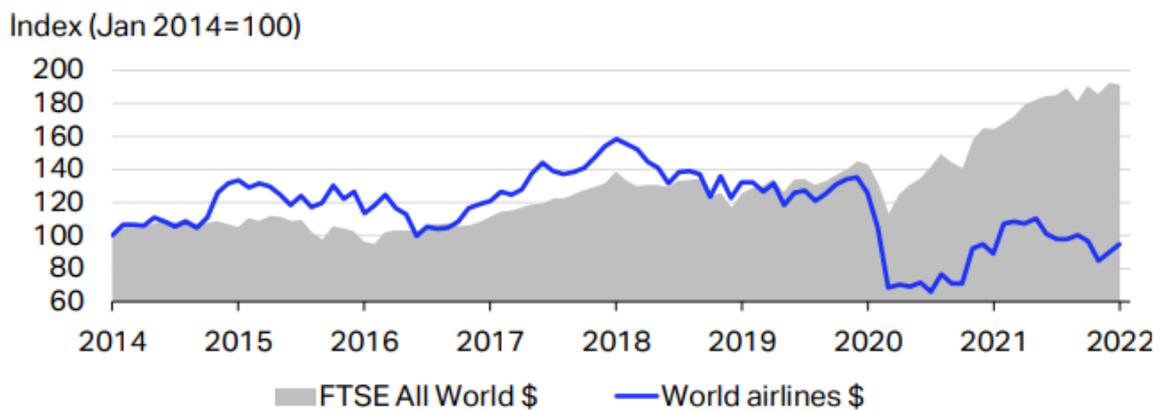
In 2022 there is likely to be an increase in air fares. This is partly due to cost pressures such as fuel which will spike more than normal because airlines have found it harder to implement fuel hedging

strategies during the pandemic. Also, there is likely to be significant pent-up demand due to the travel restrictions prevailing in 2020 and 2021 along with an increase in general inflation. Another factor in this anticipated recovery is the reduction in price competition caused by airlines going out of business.

Airline share prices have recovered from their 2020 lows, but the chart below shows that they have underperformed the overall market. This is not surprising given the continued uncertainty over the timing of recovery and the probable requirement to strengthen balance sheets by issuing new equity at the cost of diluting existing shareholders.

Airline Share Prices

US\$ indices (Jan 2014=100)	Index Jan 11th	% change on		
		vs Dec 10th	vs Dec 2019	start of year
World airlines	94.7	7.0%	-30.0%	+5.8%
Asia Pacific airlines	76.4	16.2%	-30.5%	-0.5%
European airlines	81.4	-0.3%	-28.1%	+13.4%
North American airlines	119.6	7.8%	-28.7%	+6.4%
FTSE All World \$	190.8	0.3%	+31.9%	-0.9%



Source: Refinitiv Eikon Datastream

(IATA Airlines Financial Monitor, December 2021)

Significant airline credit events in Q4 2021 were:

- Alitalia ceased operations and transferred most of its operations to its successor ITA (it should be emphasised that this was an orderly process and cannot really be characterised as a default)
- Blue Panorama (Italy) suspended operations
- Great Dane Airlines (Denmark) ceased operations and filed for bankruptcy
- ITA (Brazil) suspended operations
- Tayaran Jet (Bulgaria) ceased operations

According to the aviation consultancy Ishka 17 airlines with 1,557 aircraft were under formal restructuring in in January, a decrease from October.

Aircraft Leasing Industry Consolidation

Q4 2021 saw the closing of the largest aircraft leasing merger in the history of the industry, AerCap's acquisition of GECAS. Given this important event and the popularity of industry consolidation as a topic of conversation amongst those who work for aircraft lessors, it seems opportune to review consolidation's history and consequences.

The table below tracks all aircraft leasing M&A activity since 2000 that we are aware of. We have classified transactions under the headings of either "Consolidation" or "New Entrant". In a Consolidation transaction both buyer and target are already industry participants whereas a New Entrant Transaction involves a buyer that is not. We have also included a rough transaction value based on the target's fleet at the year-end before the transaction.

Year	Buyer	Target	Description	Aircraft Value (\$M) ⁵
2021	Carlyle Aviation	AMCK	Consolidation	3,876
	AerCap	GECAS	Consolidation	19,916
	Carlyle Aviation	Fly Leasing	Consolidation	2,809
2020	Marubeni	Aircastle	New Entrant	7,215
2019	Tokyo Century	Aviation Capital Group	New Entrant	10,404
	AMCK	Accipiter/MCAP	Consolidation	5,009
2018	Goshawk	Sky Leasing	Consolidation	1,875
2017	DAE	AWAS	Consolidation	7,538
2016	Avolon	Hong Kong Aviation Capital	Consolidation	3,070
	Avolon	CIT Aviation	Consolidation	11,120
	Nordic Aviation Capital	Aldus Aviation	Consolidation	640
	Nordic Aviation Capital	Jetscape	Consolidation	1,015
2015	Bohai Leasing	Avolon	New Entrant	6,691
2014	AerCap	ILFC	Consolidation	28,170
2013	SMBC Aviation Capital	SMFL	Consolidation	205
	SMBC Aviation Capital	Sumisho Leasing	Consolidation	2,979
2012	MUFG	Jackson Square	New Entrant	3,013
	SMBC/Sumitomo Corp.	RBS Aviation Capital	New Entrant	7,495
2010	AerCap	Genesis Lease	Consolidation	1,631
	AerCap	Oasis Intl. Leasing	Consolidation	n/a
2007	AWAS	Pegasus	Consolidation	2,874
2006	Bank of China	SALE	New Entrant	2,719
	Terra Firma	AWAS	New Entrant	2,162
2005	Aviation Capital Group	Boullioun Aviation	Consolidation	2,718
	Cerberus	Debis AirFinance	New Entrant	2,484
2000	Morgan Stanley	AWAS	New Entrant	2,639
	Debis AirFinance	AerFi	Consolidation	n/a
	Westdeutsche LB	Boullioun Aviation	New Entrant	1,233

⁵ Aircraft value figures are determined by using historic Avitas CMVs for all aircraft under management per Cirium at the year-end before acquisition. Some lessors such as FLY had outsourced aircraft management so no meaningful numbers are available on this basis. For Fly Leasing and Genesis Lease we have used aircraft net book value at the year-end prior to acquisition. Aircraft value as calculated here will tend to understate total transactions value because aircraft lessors have significant other assets including cash and pre-delivery payments.

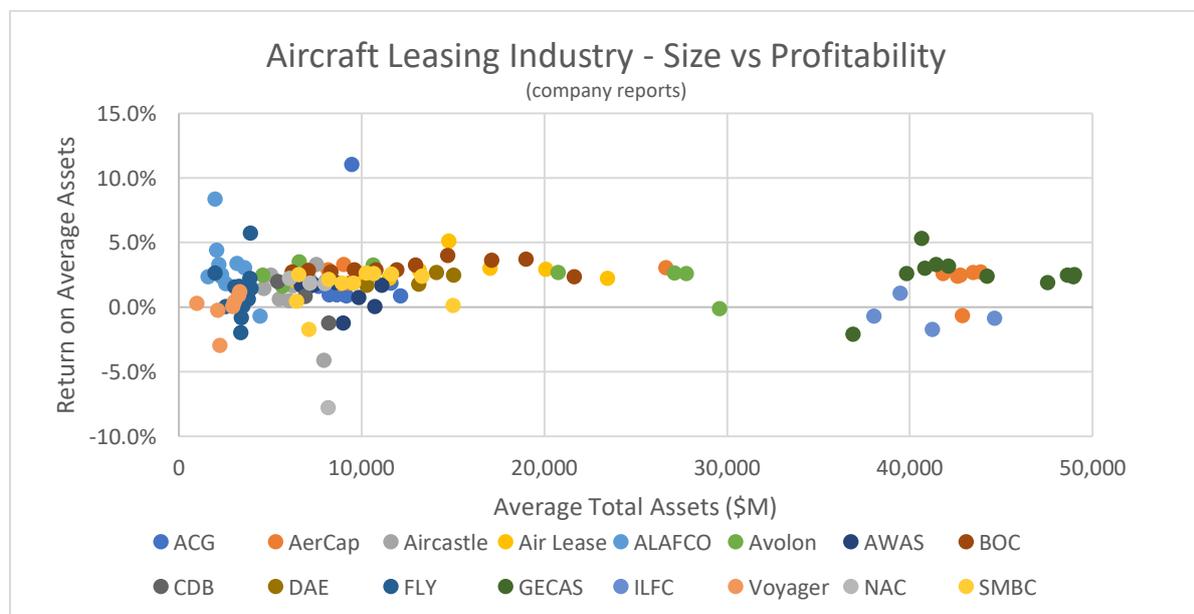
Buyer motivation varies depending on whether they are already an industry participant. New entrants are looking to avoid the challenges of establishing a business from scratch and put a value on the asset management platform as well as the aircraft portfolio. Transactions driven by consolidation tend to be about scaling up an existing business and can involve significant attrition for employees of the target company.

The number and scale of transactions has clearly increased since 2010 but this does not necessarily mean the industry has become more concentrated as the total value of the industry has increased as well. The table below shows shares of total industry value for the top ten and top twenty lessors since 2001. The industry has become more fragmented with the share of the top ten dropping by 24% and the top twenty by 20%, slightly less⁶.

Year	2001	2011	2021
Total Industry Value (\$M)	82,932	190,932	357,525
Top Ten Share	77%	64%	53%
Top Twenty Share	89%	79%	69%

A big part of the recent history of aircraft leasing industry structure is the impact of new entrants from China, starting with Bank of China's acquisition of SALE in 2006. There have been a significant number of these new entrants and they comprise ten of the top twenty and 35% of total industry assets at December 2021. Apart from Bank of China the only other Chinese new entrant to acquire an existing platform has been Bohai Leasing, which bought Avolon in 2015. The other new entrants have been highly price-competitive, particularly for sale-leasebacks of new aircraft, which has limited the ability of industry incumbents to grow as much as they might have anticipated.

Consolidation can be a very sensible reaction to this kind of aggressive competition. It does not necessarily improve profitability – the chart below shows profitability vs size for a broad range of aircraft lessors from 2010 to 2020 and there is only a modest upward trend. This should not be a surprise because the aircraft leasing market is efficient, and scale does not confer pricing power.

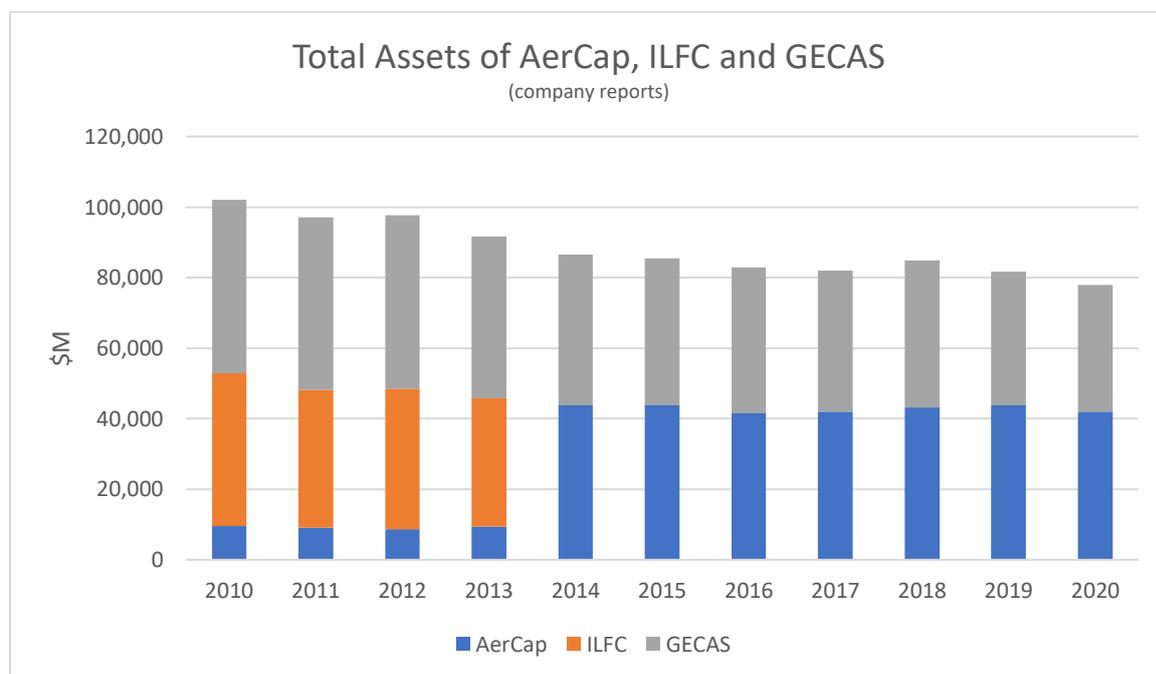


⁶ Lessor fleet statistics include all managed aircraft per Cirium Fleets Analyser and values are historic Avitas CMVs.

However, growth through acquisition can avoid some of the disadvantages of “organic” growth, particularly the acquisition of aircraft types that are not well suited to leasing, such as those with a limited airline customer base. Most of the outliers in the chart on the upside are US lessors that benefitted from President Trump’s one-off changes to corporate taxation in 2017 (we use after-tax profits so we can include GECAS on an apples-to-apples basis). The big outlier in terms of ROA on the downside is Nordic Aviation Capital, a specialised regional aircraft lessor, in 2020.

When one looks at the scatter plot for the largest lessors there are single loss-making years for AerCap and GECAS, both in 2020 as a result of COVID-19. However, there is consistent weak performance from ILFC in the period 2010-2013, mainly caused by asset impairments. ILFC did not make any material acquisitions and had a very high concentration on twin-aisle aircraft.

AerCap’s acquisition of GECAS means that it now owns both of the traditional industry “big two” (it acquired ILFC in 2014). From 2010 to 2020 the aggregate total assets of these three companies declined by over 20% while the overall value of the aircraft leasing industry more than doubled. This absolute and relative decline shows the growth challenges faced by well-established lessors when faced with unprecedented price competition.



However, there are number of good reasons to do this transaction apart from growth. AerCap will remain the industry leader in terms of scale for the foreseeable future which should help it when negotiating new aircraft acquisitions from Airbus and Boeing, and It also has the opportunity to reduce its S, G & A costs relative to assets. Although it may be hard to grow the business in absolute terms AerCap has demonstrated its ability to grow shareholder value in recent years by selling aircraft at a healthy profit and buying back shares at a discount to book value. It can keep doing this and will retain the option to increase its new aircraft purchases through sale-leasebacks if that market tips in favour of the buyer.

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