Future Size and Shape

WHAT WILL the aviation industry look like when it finally emerges from the existential crisis of the Coronavirus pandemic? At the moment that is an unanswerable question, and depends so much on how long the world's economy remains stalled, the world's population stays in lock-down and borders stay closed. There is a distinct possibility that it will change beyond recognition: we can only speculate.

Politically, aviation is of strategic national importance. Commercial airlines themselves account for 1% of GDP, but there are huge swathes of the economy that depend on aviation: travel, tourism, hospitality, let alone trade and global business contacts and suppliers. The total economic effect including direct, indirect and induced impacts, has been estimated at around 3.5%-4% of global GDP. This rises to and estimated 8%-10% of GDP when taking catalytic impacts into account.

Airlines directly employ an estimated 2.7m people world-wide, out of 10.2m employed in the aviation industry as a whole (including airports, airport-based roles, manufacturers, air traffic controllers). But it supports induced and indirect employment of around 18.5m in related businesses and over 40m jobs in tourism.

It is essential for trade, and it will be vital for many countries to ensure continuation of air connections to enable their economies to emerge from the looming worldwide recession.

The longer the crisis lasts, the more individual airlines will run out of cash and face failure. The world's top airlines will no doubt be supported — some may be viewed as "too big to fail". But there are a large number of small and medium sized carriers whose continued existence even in the best of times has been on a wing and a prayer.

This could be an opportunity for some nation states to forego the perceived need to have a national flag carrier, and cheaper for them to invite stronger players into their markets to "guarantee" connectivity.

A subsequent development could be to move towards the ICAO preferred model that removes the substantial ownership requirement from bilaterals.

Perhaps equally likely is an increase in protectionism under pressure from populist nationalist politics and anti-globalisation movements. In any case, the industry is likely to consolidate through attrition. This in turn could lead to regulatory changes. Apart from anything else, the current cash crisis highlights how much the industry depends on advance payments for working capital, and consumer backlash may suggest to regulators that such funds

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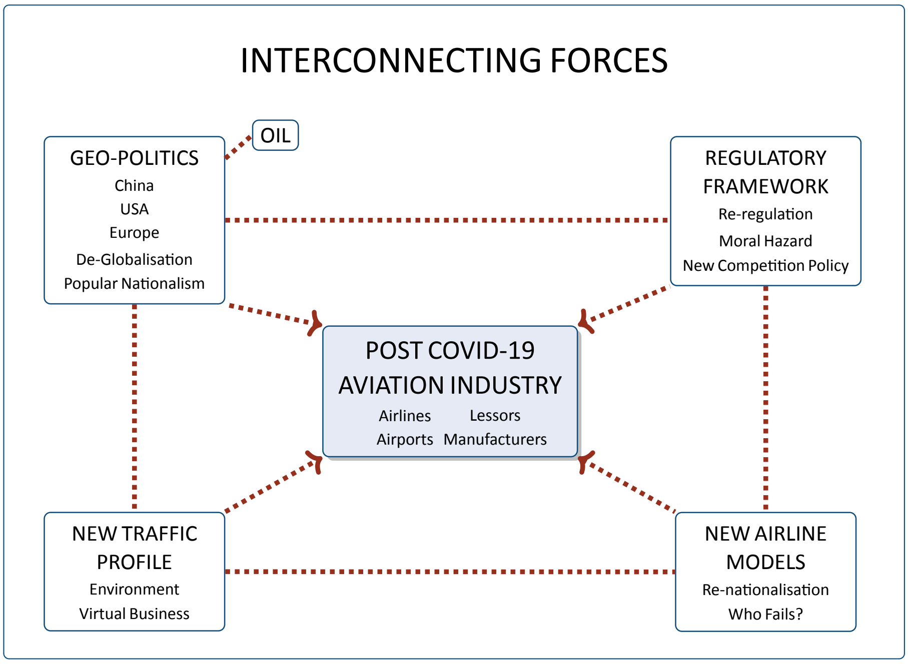

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be restricted. There is a possibility that health screening at airports become mandatory.

The drivers behind traffic growth may well change. Businesses, stung by the economic impacts of the closing of the world's economy will no doubt severely restrain travel budgets for some time even through a recovery. Having discovered that business meetings can easily take place through digital forums, it may be that these budgets will never be fully restored.

However, in each of the past industry cycles similar arguments have been proposed for technological advances to obviate the need for physical meetings, and for the very simple reason that humanity is a social animal and trust relies on the physical ability to see the "white of the eyes", business travel will no doubt resume, but perhaps at a lower elasticity to economic growth.

Leisure travel will surely resume. It may take a long time for China, which had provided so much of the engine of growth to the industry in the last decade, to return to its position as the largest outbound tourist market, but the social dynamics that would lead it there are probably still in place.

Fear and distrust, and the practise of social distancing might even put pressure on airlines to increase personal space on board unwinding decades of seat "densification" (although it is a bit difficult to imagine how airports could do the same). This, a smaller industry, and the significant increase in a debt burden on surviving players could well add to costs and fares to put a dampener on leisure demand recovery.

There is a faint hope that new players will eventually emerge — there is likely to be a very large number of aircraft with reasonable remaining useful lives that could return from storage, while the manufacturers as in the aftermath of September 11 could become desperate to place new aircraft.

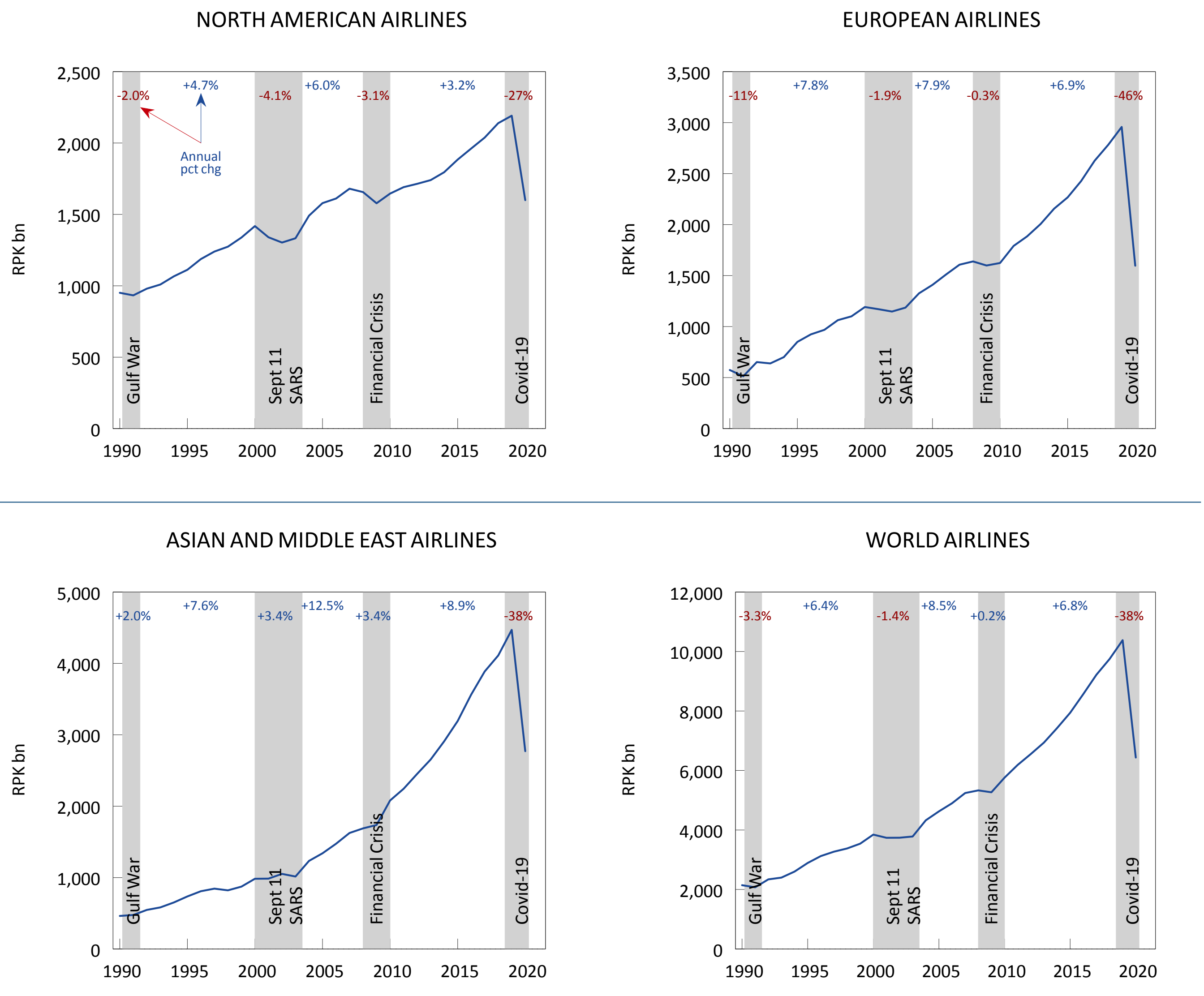
The first phase of the long-haul low cost model may not survive in its current form and with current proponents, but the availability of cheap long haul aircraft might suggest to the likes of Ryanair that the time is ripe to develop for the opportunity.

Aviation ingests a huge Black Swan

THE TERM "Black Swan" was popularised by the philosopher/financial trader/statistician/polymath Nicholas Taleb* to describe an unpredicted event that has catastrophic consequences. From ancient times to the 1600s all swans were assumed to be white and the term "rare as a black swan" was used to describe an extremely improbable or impossible happening; then Europeans started to explore Australia and discovered that there were indeed black swans.

Taleb observed that Black Swan events are not only unpredictable and improbable but they are also inevitable. In fact, the 30-year chart on

TRAFFIC BY REGION THROUGH THE CRISES



Sources: Airline Monitor, ICAO, IATA.

**The Black Swan*, Nassim Nicholas Haleb, 2007, one in a series of five works examining risk, entitled *Incerto* the preceding page shows four major Black Swan events impacting the aviation industry.

Predicting such specific events may be impossible, but, Taleb argues, it is necessary to prepare for catastrophes. Taleb himself made a fortune from the Financial Crash by consistently maintaining a portfolio of stocks. bonds and options, most of which were designed for returns in normal times but significant portion of which was specifically designed to pay out in an extreme event. He is, admittedly, a bit vague as to how to apply this technique outside the financial markets.

According to Taleb, people, especially specialist forecasters, are psychologically very poor at accepting the inevitability of Black Swans and preparing for them. He is particularly scathing about standard forecasting, which he sees as little more than a projection of "normal" times, with false security provided by statistical techniques that are useless in open-ended environments. Normal distributions, bell curves and standard deviations, for example, were originally designed for measuring human characteristics like height, longevity, etc — a closed environment — but are inappropriately used in forecasting in complex open environments. The confidence levels forecast — to 90%, 95% or even 99% certainties — are meaningless. Taleb is probably being unfair to mainstream statisticians and forecasters, but he does have a point about how easy it is to be complacent when all seems to be going well — the Great Moderation that preceded the Global Financial Crash, for example. Taleb uses the analogy of a semi-intelligent turkey who predicts its contented future based on its experience of being carefully looked after and well fed every day, blissfully unaware that this is the lead-up to Christmas.

In a typical twist, in order to make sure no one can fully follow his constantly evolving ideas, Taleb is now saying that Covid-19 is closer to being a White than a Black Swan as the potential risk of a pandemic in an ever more closely interconnected world was or should have been well known.

Maybe; but the impact of Covid-19 on the aviation business is genuinely unprecedented. As the graphs on the previous page highlight, global air traffic, measured in RPKs, has just fallen off the cliff. By contrast, the previous Black Swan events — Gulf War 1, September 11, and the Global Financial Crisis — look like relatively minor blips in the long-term traffic pattern. Covid-19 is unprecedented in its global impact: all regions have been severely affected whereas Asian traffic stood up well to both September 11 and the Financial Crisis. It is

CAPACITY AND YIELD ASSUMPTIONS

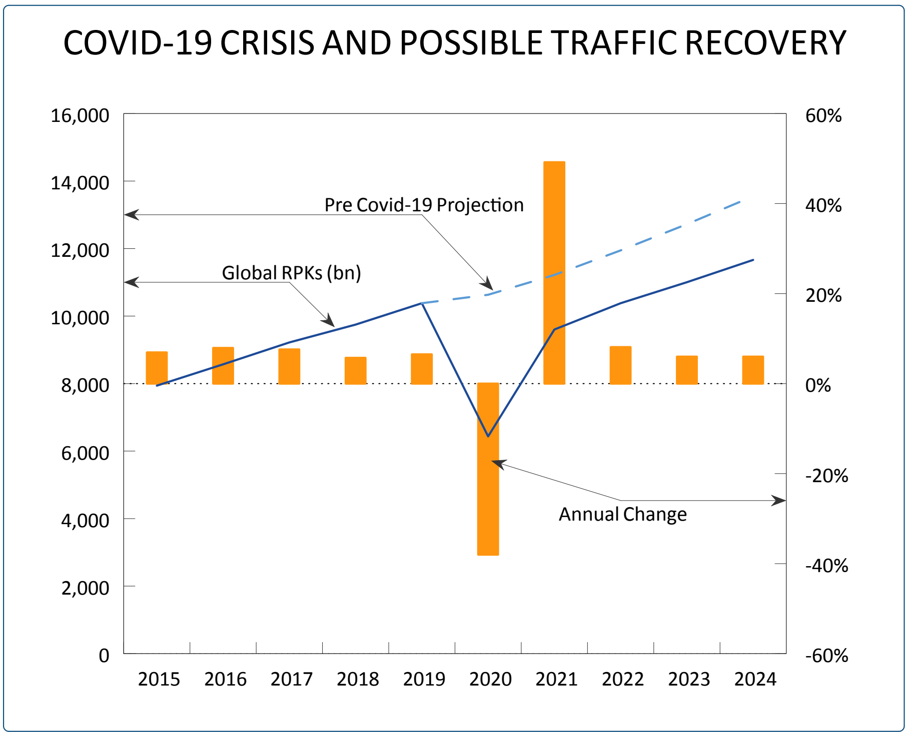
	2020			
Region of airline registration	**Q1**	**Q2**	**Q3**	**Q4**
	Capacity			
Asia Pacific	-18%	-50%	-25%	-10%
North America	-8%	-50%	-25%	-10%
Europe	-10%	-90%	-45%	-10%
Middle East	-23%	-80%	-40%	-10%
Africa	-10%	-60%	-30%	-10%
Latin America	-9%	-80%	-40%	-10%
Industry	**-14%**	**-65%**	**-33%**	**-10%**
	Passenger yield			
Industry	-8%	-6%	-4%	-3%

Source: IATA

PRE-COVID PROJECTED JET DELIVERIES

	BOEING							AIRBUS								OTHERS	TOTAL
	737 NG	737 MAX	747	767	777	787	Total	A220	A320ceo	A320neo	A330	A330neo	A350	A380	Total		
2019	70	57	7	43	45	158	**380**	48	91	551	12	41	112	8	**863**	151	**1,394**
2020	40	236	10	30	55	140	**511**	60	66	656	20	50	124	9	**985**	184	**1,680**
2021		610	10	30	55	140	**845**	70		760	15	50	120		**1,015**	260	**2,120**
2022		650	10	30	70	140	**900**	70		730	15	60	110		**985**	310	**2,195**
2023		680	5	30	100	175	**990**	70		750	10	70	130		**1,030**	390	**2,410**
2024		540	5	30	120	155	**850**	60		590	10	50	100		**810**	350	**2,010**
2025		620	5	30	120	165	**940**	80		690	10	60	100		**940**	360	**2,240**

Source: Airline Monitor

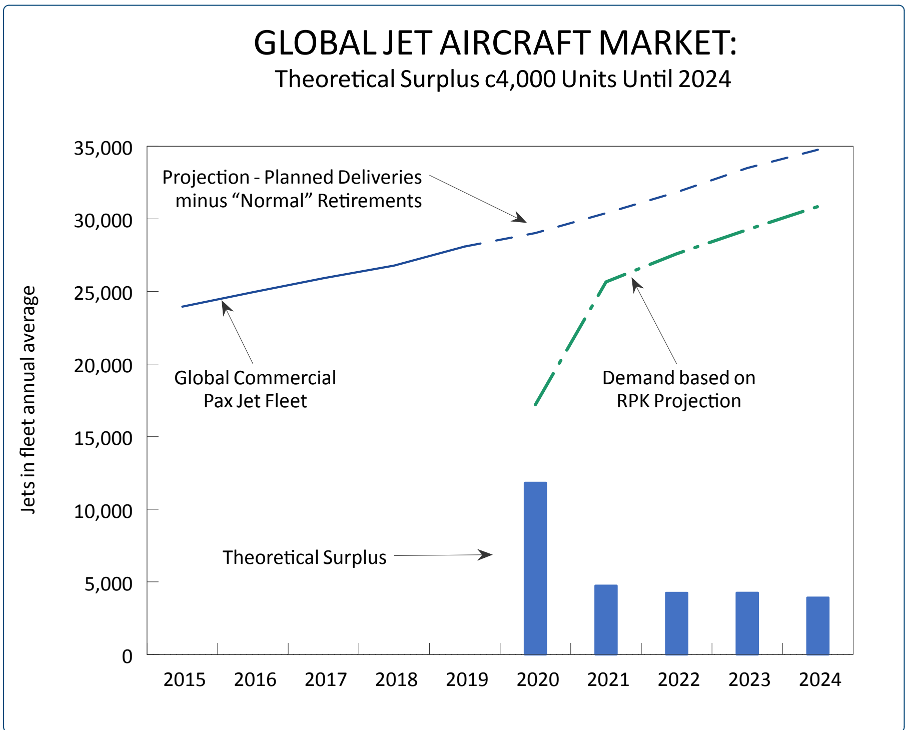


also unprecedented in the duration of its impact: airline executives recall global traffic falling by a third after September 11 or even after the SARS outbreak in Asia in 2003, but in both cases this decline was only for a few weeks before it started to recover. The full impact of the enforced grounding of aircraft by governments, because of Covid-19, is going to last for two quarters of this year at least.

IATA's late-March prediction for global RPKs in 2020 was -38%. We have taken this figure though it is already starting to look a bit optimistic. IATA's traffic forecast was predicated on the assumed reductions in airline capacity shown in the table on the facing page, but it now seems unlikely that airlines will recommission operations equivalent to 90% of 2019 in the final quarter, and the analysis does not take into account new restrictions on inter-state travel in the US.

Our idea of what the traffic demand curve will look like post-Covid-19 is shown in the chart on the left. (This and the following charts are not meant as reliable forecasts — Taleb has put us off — but as a framework within which to consider future trends.) In 2021, assuming no second-phase epidemics, the suggested global RPK growth rate is a remarkable 49%, the rebound being based on assuming that traffic the first half of that year will be 15% below 2019 and the second half at the same level as in 2019. A further 8% increase in 2022 would restore global traffic to the full year 2019 total.

At what rate will traffic "normalise" after the rebound? Looking at the long-term graphs, there is no consistent answer; traffic growth rates in various markets can be below or above pre-crisis rates. Long term trends do not miraculously recover lost passengers, rather the post -crisis growth trends are the result of structural changes that have taken place in the industry, and the crises frequently act as catalysts for structural change. So, for example, European traffic grew strongly after the September 11 crisis largely because of the emergence of LCCs; Asian traffic after the Financial Crash was sustained by the emergence of China and the Super-Connectors; modest North American traffic growth at the



same time was largely the result of US major carriers' restructuring and consolidation, trading expansion for profits.

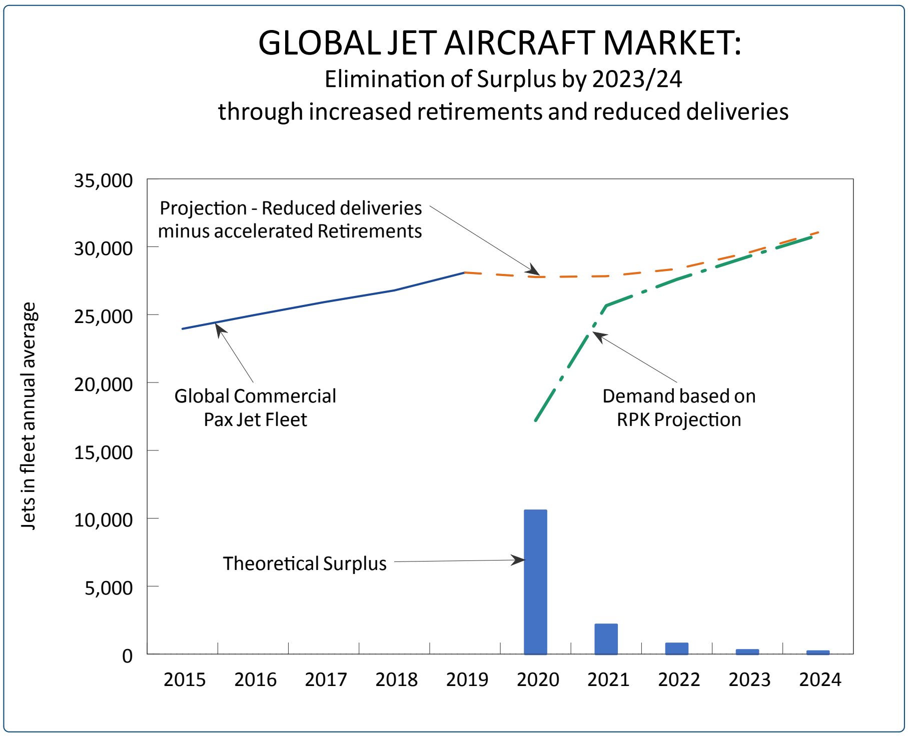
It seems that in the post-Covid-19 world the structural changes will tend to depress the demand curve, and traffic will not get close to catching up with pre-Covid-19 expectations.

✈ Business travel will be changed by Covid-19 isolation. It could have created a generation of Zoom executives, working effectively from home and communicating via videoconference, although many hate the isolation and get frustrated by the still clunky technology. In any case, corporations will be desperate to cut costs and travel budgets will be one of first items to be slashed.

✈ Leisure travel is more difficult to call. There is undoubtedly huge pent-up desire for travel but how this will translate into demand depends on the damage done to personal balance sheets.

✈ Airline costs should fall because of lower capital costs (ultra-low interest rates and oversupply of aircraft), labour costs (rationalising of operations), fuel costs (the collapse in oil prices minus losses on hedges), and if this translates into lower fares, there could be conceivably be some stimulus to traffic. On the other hand, most airlines appear to be determined to rein in capacity and cut expansion plans which will have the opposite effect on fares.

✈ The anti-flying movement has been reinforced by the global grounding of aircraft. Suddenly NOx and carbon emissions have been radically reduced and noise pollution around major airports eliminated. There will be intense pressure for some of these environmental improvements to be retained after flights resume.



So we have plumped for an arbitrary 6% pa average growth rate post the rebound; it would take an average 15% pa growth rate to get back to the pre-Covid-19 trendline.

What all this means for the global supply/demand balance is illustrated in the chart above. The supply line represents the global fleet of commercial passenger jets with the projection, which includes 2020, estimated from planned deliveries from the manufacturers minus retirements from the fleet (put at the historically high rate of 750 units a year). This was the industry's expectation pre-Covid-19.

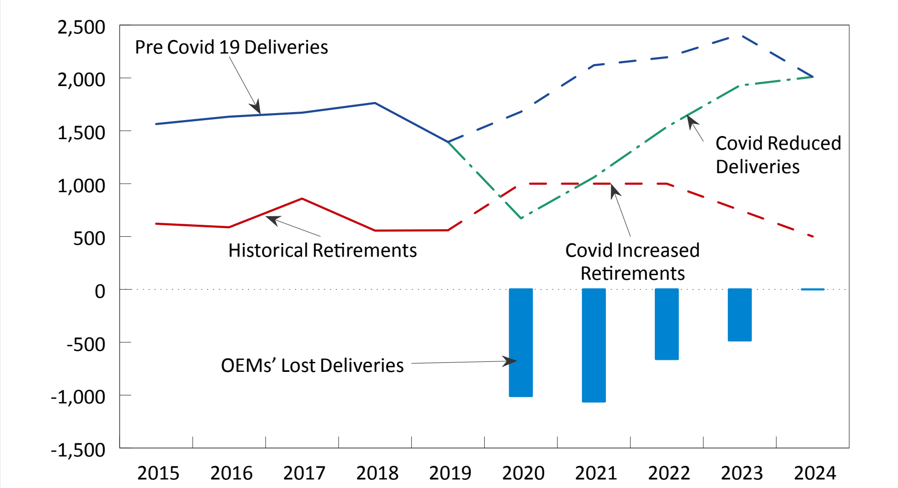
The lower line is the RPK forecast converted into average aircraft units (nominally 192 seats) under the assumption of "efficient" utilisation (82% load factors and 8.6 hours/day). The difference between the two lines is the surplus. 2020 is of course a disaster, but what is perhaps worrying is that the surplus persists through to 2024 at least with a surplus of around 4,000 units, roughly twice the OEMs' annual expected output.

The surplus is theoretical because such projected gaps are always filled, one way or the other. The next graph on the current page shows the surplus being eroded bring the industry back into equilibrium in 2024, maybe 2023. Note that restoring equilibrium depends entirely on a flattening of the supply curve (unless there is a divine intervention on the demand side).

How this might be achieved in shown in the final graph on page on the facing page — a combination of reduced deliveries and increased retirements. In this scenario the OEMs will have to cut deliveries by about 40% in total during 2020-23 — over 3,000 units or about $300bn in revenue. Retirements will have to average 1,000 units a year for at least three years, compared to around 600/year in the past decade.

It is highly unlikely that these changes will be made smoothly.

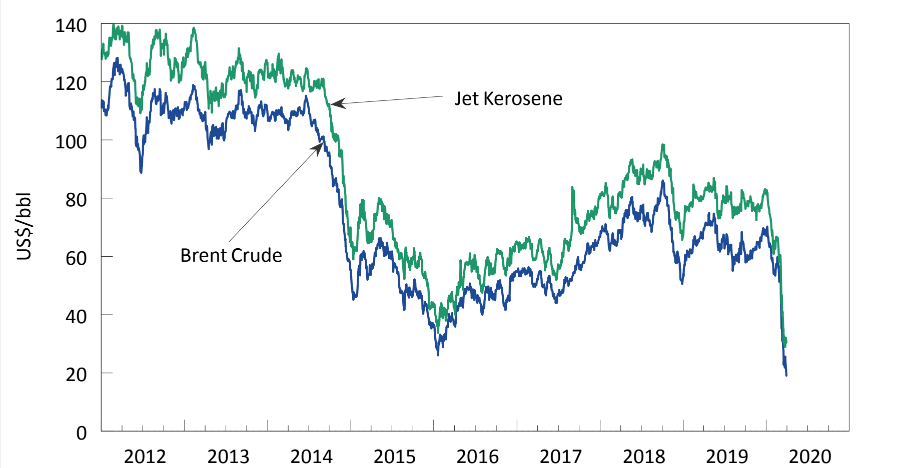
GLOBAL JET AIRCRAFT MARKET: TO RESTORE EQUILIBRIUM
Three years of peak retirements and 40% reduction in deliveries to 2024



Manufacturers, desperate for cashflow, will attempt to enforce delivery contracts. Airlines, equally desperate for cashflow, will defer deliveries and cancel contracts wherever possible. Lawyers will be examining break clauses where aircraft deliveries have been delayed — the MAX is the clearly the most vulnerable, but delays have also affected the A321, 777, 787, A330 and A350.

Then there is the reality of retirements. If aircraft are scrapped or parted-out then they are definitely taken out of supply, but parked aircraft, especially repossessions, may return to the market. It is possible that the Covid-19 crisis will create a stockpile of older but perfectly serviceable aircraft available for intrepid entrepreneurs to pick up at bargain prices. If the oil price remains very low these aircraft will become more attractive. And there will also be a surplus of pilots and mechanics looking for employment. It could be a classic combination for start-ups.

CRUDE OIL AND JET KEROSENE



Source: EIA

In the middle of Covid-19 mess sit the lessors, massively exposed — 33% of the global operating fleet, 50% of the orderbook — to precipitous falls in asset values. AVAC, the only one of the leading appraisal companies to focus on actual values as opposed to now-irrelevant fair market values, has downrated its aircraft valuations by 25-35%, and that is unlikely to be the bottom. There is pain on both sides: cancelling orders, as Avalon has just done, means losing deposits and PDPs while the airlines are queuing up to renegotiate leases and threatening to return aircraft early. Moreover, unlike the manufacturers, airlines and airports, lessors have no plausible state aid case.

The shock will be immense for the operating lessors. They have expanded consistently over the past 25 years and navigated September 11 and the Global Financial Crash with minimum casualties. But this period of history does not include, as Taleb might point out, the sudden implosion of GPA, then one of two giants in the aircraft leasing business, in 1992 — a Black Swan caused by a combination of unexpected adverse events and irrational expansion.

Boeing, Airbus and State aid

It is almost inevitable that the OEMs will receive some form of government support as the national interest/ security argument is just too politically powerful. Boeing asked for $60bn of aid for the entire aerospace industry before the full threat of the pandemic was apparent in the US. It has been offered $17bn from the federal government's $2tr stimulus package, but appears reluctant to accept this as it would involve the state taking equity

BOEING: BALANCE SHEET

($ Billions,End 2019)	
Property and Plant	12.5
Intangibles (inc Goodwill)	12.6
Inventories	76.6
Cash etc	9.6
Other Assets	22.3
TOTAL ASSETS	**133.6**
Advances and PDPs	51.6
Accrued Liabilities	22.9
Pension/Health Plans	20.8
Accounts payable	15.6
Short-term debt	7.3
Long-term debt	**23.4**
Other	**0.3**
TOTAL LIABILITIES	**141.9**
EQUITY (DEFICIT)	**-8.3**

AIRBUS: BALANCE SHEET

(€ Billions, End 2019)	
Property and Plant	17.3
Intangibles (inc Goodwill)	16.6
Inventories	31.6
Cash etc	9.3
Other Assets	39.6
TOTAL ASSETS	**114.4**
Advances and PDPs	41.2
Other Short Term Liabilities	21.1
Pension Plans	8.3
Other Liabilities	12.6
Long term debt (inc Govt funding)	25.2
TOTAL LIABILITIES	**108.4**
EQUITY (DEFICIT)	**6.0**

in the manufacturer. Airbus has not yet made an explicit request for aid, but has been in talks with its German and French government shareholders (22% of the total).

But should the OEMs receive state aid? Going back to Taleb's contention that corporations must prepare for extreme events because they are inevitable as well as improbable, and the cost of preparation should be an integral part of a corporation's financial planning, have Boeing and Airbus followed such a strategy?

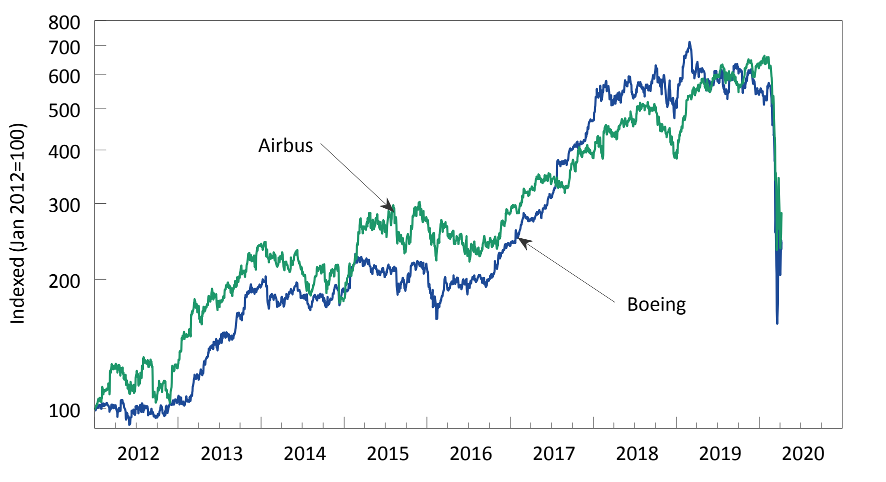
The short answer is no. The cashflow for the two OEMs from 2012 to 2019 are summarised in the tables on the next page. Over the period 2012-19 Boeing generated $50.8bn in Free Cashflow (ie, after all operational flows and capital expenditure) but it then returned a total of $65.7bn to shareholders through dividends and share buy-backs. What this means is that Boeing has in effect being borrowing money, $14.9bn in total, to recycle to shareholders in order to support its share price; it slightly decreased its cash reserves over this period. It continued this financial strategy in 2019 despite the MAX crisis, leading *Aviation Strategy* to speculate wildly about state aid (November 2019) before anyone had heard of Covid-19. By the end of 2019 Boeing's book value on its balance sheet had fallen to -$8.3bn.

Airbus has been doing more of less the same thing, but to a lesser extent. During 2012-19 Free Cashflow totalled €9.9bn while shareholders received €11.7bn in dividends and share buy-backs. It at least has maintained a positive value on the balance sheet, €6.0bn.

Yet from investors' perspective the OEMs' financial strategy looked like a success until this year — the OEMs' share prices soared by a factor of six between 2012 and the beginning of 2019, and held up reasonably well during the MAX crisis. Indeed, the financial strategy largely reflects the pressure that has been put on equity markets to outperform as interest rates have maintained at ultra-low levels — it's the only way a balanced portfolio can make a decent return. It had also almost obliged equity analysts to focus intently on quarterly performance, especially in the US, at the expense of longer term valuations.

A condition of government bailouts might be a regulatory requirement to hold certain levels of reserves or to limit dividends and share buy-backs to a certain percentage of Free Cashflow. This of course could introduce new distortions and have unintended consequences.

OEM SHARE PRICE PERFORMANCE



BOEING: CASHFLOW ITEMS

US$bn	2019	2018	2017	2016	2015	2014	2013	2012	Total 2012-19
Total Revenue	**76.6**	**101.1**	**94.0**	**93.4**	**96.1**	**90.7**	**86.6**	**71.2**	**709.7**
Net Result	**-0.6**	**10.5**	**8.4**	**5.0**	**5.2**	**5.4**	**4.6**	**3.9**	**42.4**
Operating Cashflow	**-2.4**	**15.3**	**13.3**	**10.4**	**9.4**	**8.8**	**8.2**	**7.5**	**70.5**
Capex/Net Investments	**-1.5**	-4.6	-2.1	-3.4	-1.8	2.5	-5.1	-3.7	**-19.7**
Free Cashflow	**-3.9**	**10.7**	**11.2**	**7.0**	**7.6**	**11.3**	**3.1**	**3.8**	**50.8**
Increase/Decrease in Debt	13.0	1.3	1.4	0.2	1.3	-0.4	0.1	-2.2	**14.7**
Share Buy Backs	*-2.7*	*-9.0*	*-9.3*	*-7.0*	*-6.7*	*-6.0*	*-2.8*	*0.0*	**-43.5**
Dividends	*-4.6*	*-4.0*	*-3.4*	*-2.8*	*-2.5*	*-2.1*	*-1.5*	*-1.3*	**-22.2**
Total financial Flows	5.7	-11.7	-11.3	-9.6	-7.9	-8.5	-4.2	-3.5	**-51.0**
Net Change in Cash	**1.8**	**-1.0**	**-0.1**	**-2.6**	**-0.3**	**2.8**	**-1.1**	**0.3**	**-0.2**
Cash Balance (end period)	9.6	7.9	8.9	9.0	11.6	11.9	9.1	10.3	**9.8**
Net Profit Margin	-0.8%	10.4%	8.9%	5.4%	5.4%	6.0%	5.3%	5.5%	**6.0%**
Op. Cashflow Margin	-3.1%	15.1%	14.1%	11.1%	9.8%	9.7%	9.5%	10.5%	9.9%
Capex/Investments as % of Operating Cashflow	-62.5%	30.1%	15.8%	32.7%	19.1%	-28.4%	62.2%	49.3%	**27.9%**
Share Buy Backs/ Dividends as % of FCF	-187.2%	121.5%	113.4%	140.0%	121.1%	71.7%	138.7%	34.2%	**129.3%**

AIRBUS: CASHFLOW ITEMS

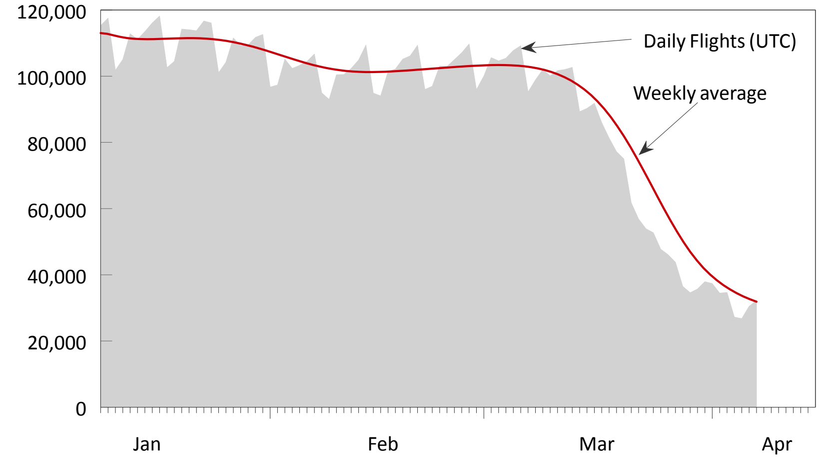
€bn	2019	2018	2017	2016	2015	2014	2013	2012	Total 2012-19
Total Revenue	**70.5**	**63.7**	**59.0**	**66.5**	**64.5**	**60.7**	**57.8**	**56.5**	**499.2**
Net Result	**-1.3**	**3.1**	**2.4**	**1.0**	**2.7**	**2.3**	**1.5**	**1.2**	**12.9**
Operating Cashflow	**3.8**	**2.3**	**4.4**	**4.4**	**2.9**	**2.6**	**1.8**	**3.8**	**26.0**
Capex/Net Investments	-2.9	-1.6	-2.5	-0.8	-3.5	-3.2	-1.6	0.0	**-16.1**
Free Cashflow	**0.9**	**0.7**	**1.9**	**3.6**	**-0.6**	**-0.6**	**0.2**	**3.8**	**9.9**
Increase/Decrease in Debt	0.3	-2.0	0.0	1.7	1.5	1.3	-0.6	3.6	**5.8**
Share Buy Backs	*0.0*	*0.0*	*0.0*	*-0.8*	*-0.3*	*0.0*	*0.0*	*0.0*	**-1.1**
Dividends	*-1.3*	*-1.2*	*-1.0*	*-1.0*	*-1.0*	*-0.6*	*-0.5*	*-4.0*	**-10.6**
Total financial Flows	-1.0	-3.2	-1.0	-0.1	0.2	0.7	-1.1	-0.4	**-5.9**
Net Change in Cash	**-0.1**	**-2.5**	**0.9**	**3.5**	**-0.4**	**0.1**	**-0.9**	**3.4**	**4.0**
Cash Balance (end period)	9.3	9.4	11.9	11.0	7.5	7.9	7.8	8.7	**9.2**
Net Profit Margin	-1.8%	4.9%	4.1%	1.5%	4.2%	3.8%	2.6%	2.1%	**2.6%**
Op. Cashflow Margin	5.4%	3.6%	7.5%	6.6%	4.5%	4.3%	3.1%	6.7%	5.2%
Capex/Investments as % of Operating Cashflow	76.3%	69.6%	56.8%	18.2%	120.7%	123.1%	88.9%	0.0%	**61.9%**
Share Buy Backs/ Dividends as % of FCF	144.4%	171.4%	52.6%	50.0%	-216.7%	-100.0%	250.0%	105.3%	**118.2%**

Cash is King: Aviation in Crisis

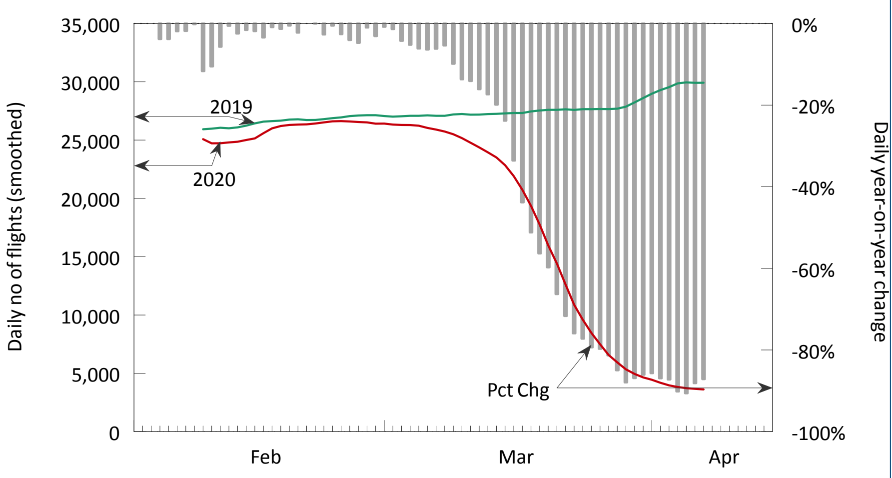
The speed at which the Coronavirus pandemic has developed world-wide has taken all but the most experienced epidemiologists by surprise. In a matter of only a few weeks the world's economy has come to a sudden halt, extreme travel restrictions have effectively closed the borders to international travel — countries representing over 90% of air transport revenues are in lock-down — and the whole airline industry is in the process of closing down.

In the early stages of the crisis we, in common with other observers, likened its effects to a combination of the last three disruptive forces to face the industry — September 11, SARS and the Global Financial Crisis. But now, it is starting to look like a form of an apocalyptic World War III — with 185 countries involved (so far) and each with their own internal theatre of war.

The world's stockmarkets have taken a battering since the end of February: New York's Dow Jones and London's FTSE indices are down by a massive 30%, the Nikkei and Hang Seng by over 20% since the beginning of the year. Airline and other aviation stocks have all been hit harder (charts on page 16 and related graphs on page 17). This reaction from the markets appears natural — reflecting the seriousness of the impact of the crisis on travel related companies. But the extent to which the share price declines are matched across the board may be an irrational knee-jerk response: the best capitalised (but UK based) airlines in Europe are down by 70% with an average fall of 60% for the sector; all three majors in the US are down by 60%-70%; Chinese and Asia/Pacific airlines by an average 40%. The two major quoted hub airport groups in Europe — Aéroports de Paris and Fraport — have fallen by 50%, surprisingly similar to the declines seen by Air France-KLM and Lufthansa. Aircraft lessor share prices are down by around 70%, while the stocks of the two aircraft manufacturers, Boeing and Airbus, have moved in step and stand at 40% of the level at

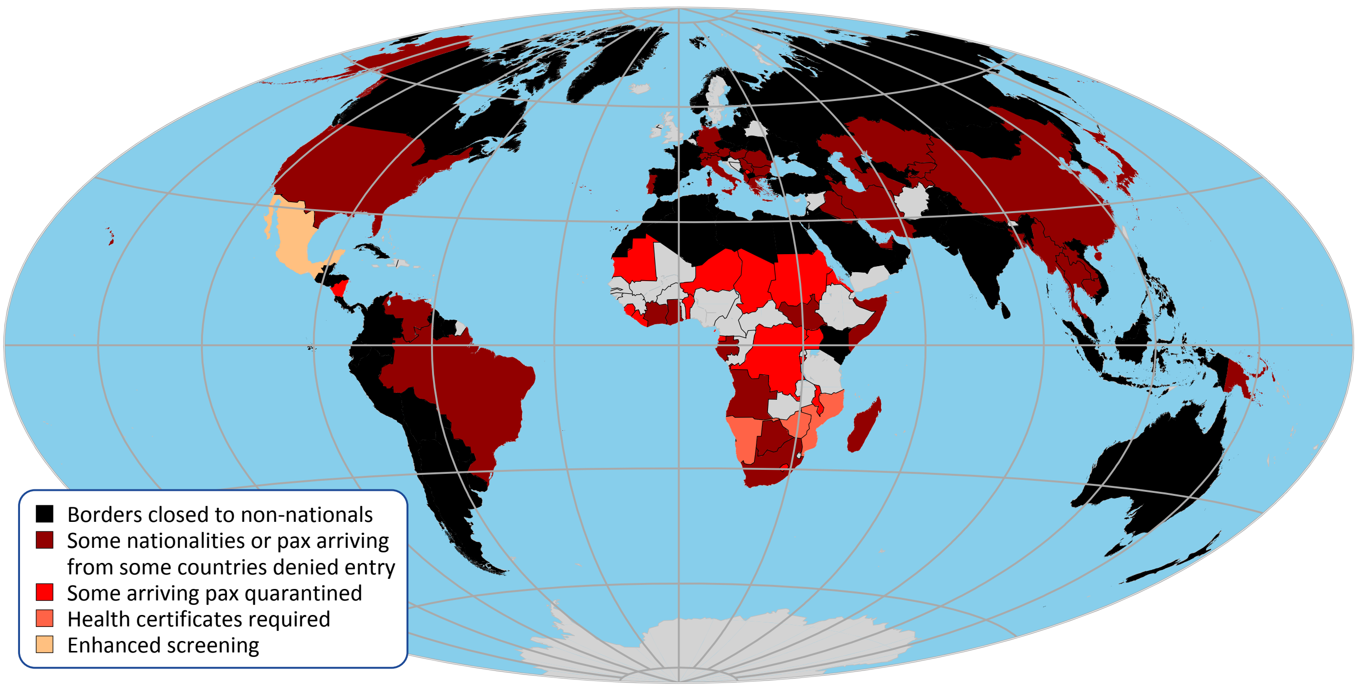


Source: Flightradar24



Source: Eurocontrol

WORLDWIDE TRAVEL RESTRICTIONS

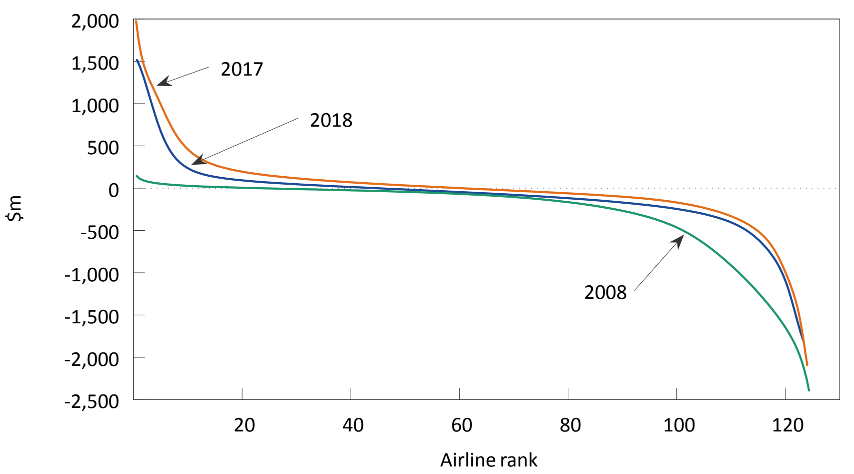


the beginning of the year.

As in war time, governments are throwing money at their economies. In the US, the Federal Reserve cut interest rates to zero and started throwing money into the financial markets in the attempt to provide stability, while at the end of March President Trump was able to enact the suitably acronym-able Coronavirus Aid, Relief, and Economic Security (CARES) Act to provide funds of a staggering $2tn in support to states, businesses, hospitals and households (equivalent to 10% of GDP). Many other countries have taken similar steps: the UK with a package equating to around 15% of GDP, Singapore 11%, Spain 17%, Australia 6%, and even Germany, abandoning its "zero black" rule is proposing spending 4% of GDP.

Demand for air travel has all but evaporated, and airlines have started grounding aircraft at a significant rate. As the chart on the facing page shows, Europe is notably affected: the number of flights recorded by Eurocontrol has fallen precipitously since the beginning of March to a level 90% down on prior year levels. But as the chart on the preceding page suggests, this is only a third of the story world-wide: flights tracked by flightradar24.com are down by over 70% from the average in the first two months of the year. Although

WORLD'S AIRLINES RANKED BY ECONOMIC PROFITS



Source: IATA

there are signs of a pick up in activity in China, this is still modest, and the country has imposed restrictions on international flights to avoid reimporting infections with a limit of one flight a week per destination.

This is a crisis of phenomenal proportions for the whole industry. IATA in its latest assessment posits that should the clampdown on travel last three months, and assuming a gradual return to the status quo (a V-shaped rebound seen in previous shocks unlikely given the recessionary impact on the world economy), the full year would still register a massive 38% annual decline in passenger traffic (in RPK terms) and a 33% decline in annual revenues. Up to now the only years that featured an annual reduction in passenger demand were 1991 (the Gulf War), 2001 (Sept 11) and 2009 (the GFC) with respective declines of -2.6%, -2.9% and -1.1%; while the largest decline in annual revenues was -16% in 2009 during the GFC.

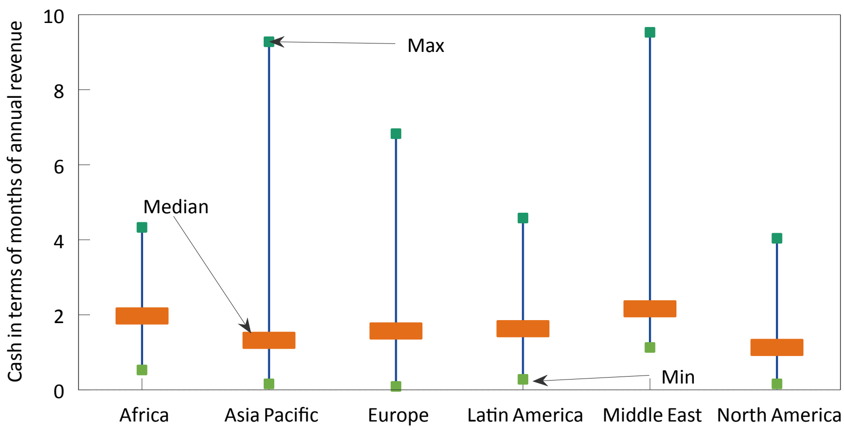
Airlines

In this environment cash is king. Although the airline industry as a whole has registered strong levels of profits in the last few years, absolute levels of profitability has been concentrated with a handful of carriers, and the improvement in returns experienced by the top 30 airlines world-wide: as the chart on the preceding page shows, there is a long tail of marginally and severely unprofitable airlines. These top 30 too tend to have the best balance sheets with net debt to EBITDAR averaging 2.5 times against 5-6x for the rest of the industry.

As a general rule of thumb, it has been considered wise for an airline to have cash liquidity equivalent to at least 20-25% (or three months) of annual revenues. Some airlines round the world manage this, or better, depending among other things on their business models. However, as the chart above shows, the *median* levels of cash before this crisis erupted stood around 15% of annual revenues, equivalent to less than two months of revenues. Even if the global lock-down lasts only three months, the implication may be that there will be many airlines who will not survive without significant levels of outside support.

But in this environment, even the large well-financed airlines will find it extremely difficult to guarantee survival.

AIRLINE CASH BALANCES AVERAGE TWO MONTHS OF REVENUES



Source: IATA, based on a sample of airlines in each region.

CASH PRESERVATION

	Cash				Advance Sales		Cash burn	
	¤m	*% Revenues*	Available	Total Liquidity	¤m	% Cash	¤m per day	months
IAG	€7,350	*36%*	1,900	9,250	5,486	59%	30	10.1
Lufthansa Group	€4,300	*14%*	800	5,100	4,071	80%	47	3.6
Air France-KLM	€3,715	*20%*	1,800	5,515	3,289	60%	36	5.2
Ryanair	€3,578	*45%*		3,578	1,309	37%	9	14.0
easyJet	£1,576	*31%*	417	1,993	1,069	54%	8	8.2
Wizz	€1,501	*54%*		1,501	420	28%	3	15.6
Norwegian	Nkr3,096	*7%*		3,096	6,107	197%	58	1.8
Virgin	£392	*14%*		392	619	158%	4	3.4
Delta	$2,900	*18%*	5,600	8,500	5,116	60%	55	5.1
American	$3,826	*15%*	3,200	7,026	4,808	68%	58	4.0
United	$4,944	*20%*	3,500	8,444	4,819	57%	53	5.3
Southwest	$4,100	*23%*	1,000	5,100	4,457	87%	27	6.4

AIRLINE EMERGENCY MEASURES

	April Capacity cuts	Aircraft currently parked†	Total fleet
Air Canada	Up to 90%. 16,500 staff on furlough	46	189
Air France-KLM	70% to 90%, Early retirement B747, grounded A380s	174	543
Air New Zealand	Long haul 95%; domestic 30%	11	114
American	International 75%, Parked "nearly all" widebody fleet.	287	947
Cathay Pacific	96%. Network cut to three flights a week on only 12 international and 3 Chinese destinations	31	152
Delta	International 21%-25%; domestic 10%-15%	351	913
LATAM	95% group-wide. Peru, Ecuador, Colombia closed passenger operations. International limited to siz routes from Santiago and São Paulo	181	332
Lufthansa	Long-haul 90%; Europe 80%. 31,000 staff on Kürtzarbeit. 700 out of 760 aircraft grounded. Swiss: 80% cut (may go to 100%). Austrian, SN Brussels closed operations.	585	757
easyJet	Closed passenger operations	334	337
Emirates	Closed passenger operations	228	269
Finnair	90%. Network reduced to 20 routes	12	72
IAG	At least 75%	296	587
Norwegian	85%. Lays of 90% or workforce	127	146
Qantas	International 100%; domestic 60%	54	264
Ryanair	99%	73	468
SAS	"Most" of its schedule. 90% of employees furloughed	67	153
Singapore	96%	48	185
Southwest	40%	123	742
United	International 95%	248	800
Virgin Atlantic	Up to 85%	11	42
Westjet	International 100%; domestic 50%	12	126
Wizz Air	85% and may go to 100%	56	121

Source: planespotters.net
Notes: † at 31 March 2020

In Europe, Lufthansa was one of the first to react — and with draconian measures. On the announcement of its annual results it revealed that while net bookings had been weak during January and February, they had plummeted since the extent of the pandemic in Italy had clarified and by the 9th March, the day before the results, had been 65% down on prior year levels.

Perhaps with a corporate memory of narrowly avoiding going bust in September 2001, Lufthansa announced that it would cut capacity by 90% from original plans and apply for *Kurtzarbeit* (support for short-time working) for a large proportion of its employees. And this was before the USA imposed travel restrictions on Atlantic services from Europe.

Of the top European carriers, Lufthansa had one of the lowest levels of liquidity entering this crisis with cash standing at only 14% of revenues, and clearly felt the urgent need to enter cash preservation mode. Management highlighted that with the grounding of its fleet around 60% of its operating costs would be mitigated, that it would cut back on all non-essential expenditure, defer capital spending and aircraft deliveries, and use its largely fully owned fleet as collateral to raise debt and important cash resources.

The rest of the airline industry worldwide perforce is now following Lufthansa's example, urgently drawing on available credit lines where they can, and asking governments for help.

One of the greatest concerns, as cancellations exceed bookings, is how to cope with the the cash drain implied by refunds. All airlines use the advance payments they receive as working capital — to a greater or lesser degree depending on their business model (see table on the facing page). And for some, as finances deteriorate, credit card companies increase the proportion retained until carriage has been performed.

In its latest assessment of the Coronavirus crisis, IATA points out that that the industry as a whole could have $35bn due for refund in the second quarter — 60% of their estimate of the total industry cash burn in the period. It is lobbying to allow airlines to provide refunds in vouchers rather than cash.

But the crisis is also having an equally disastrous impact on other elements of the industry.

Lessors

The aircraft lessors, had already seen requests from the Chinese and some SE Asian carriers for rental deferrals and rate renegotiations in February. AirAsia X for example stated as it announced a 60% increase in losses for 2019 — to RM-489m ($-118m) from RM-301m in 2018 — that it was looking to renegotiate a 30% reduction in rates for its 24 leased A330s (16 of which are currently parked), and defer delivery of its A330neos on order. The leasing companies are now rumoured to be getting similar requests from a large number of other carriers world-wide.

The lessors as a whole survived the various industry crises of the past forty years relatively unscathed. But they now control nearly 50% of the jet aircraft in service world-wide (twice the ratio they had in 2001). Apart from the pressure from their airline customers to defer and reduce payments, there is likely to be an increase in demand for sale and lease backs, at the same time that aircraft values will be plummeting. Their share prices have also plummeted since the beginning of the year (see chart on page 17).

AerCap, the largest player in the sector, at its full year results in February and then a JP Morgan conference in March appeared relatively relaxed. CEO Aengus Kelly said that in terms of the company's exposure to China, "two-thirds of our revenue comes from the big three state-owned carriers. These airlines have been our partners for decades, and they will be our partners for decades to come. We will help them where we can through this very challenging period." And then three days after that conference, AerCap drew down its entire $4bn unsecured revolving credit line (which will at least more than cover the $196m it spent in the fourth quarter of 2019 in share buy-backs).

Avalon, at the beginning of April, announced it had cancelled orders for four A330neos, 75 737MAXs (originally due for delivery in 2020-23) and deferred nine A320neos by six years. In total it has reduced its aircraft commitments for the next three years from 284 aircraft to 164. At the same time it also has drawn down its entire $3.2bn revolving credit facility. "We are currently facing the most challenging period in the history of commercial aviation", said CEO Dómhnal Slattery, mentioning that 80% of Avalon's customers had requested relief from payment obligations under their leases, and that these lessees accounted for more than 90% of its annual rental cashflow.

Governments to the rescue

This is a global crisis and yet unlike for example during the equally global financial crisis of 2008-09 there appears to be no international concerted action or leadership: each country is trying to deal with the problem on its own. But then, in the last five years there has been an increase in nationalist and populist politics and protectionism.

Even the fabric of the EU's cohesion seems to be under further strain with individual European countries doing their own thing: and Hungary's transition to government by presidential decree is seen in Brussels as contrary to EU rules. Indeed, the European Commission appears to be faffing around trying to create a role for itself in the crisis and work out what to do: it took a long time for it to realise the extent of the traffic downturn and relax the "use it or lose it" rules for airport slot allocation under which airlines would otherwise be forced to operate empty flights; its continued insistance on EU261 consumer protection regulations requiring cash refunds for cancellations has been unilaterally overturned by some individual nation states.

Faced with the effective closure of each nation's (and the global) economy, there has been a desperate scramble to put packages in place to support all industries, their cashflow problems, and (primarily) employees and wages. In this light aviation, while being seen as an important strategic element of national infrastructure, is only a small part of the overall industrial problem.

In the US, within the CARES Act providing $2tn "relief", a maximum of $208bn has been set aside for direct grants, loans and loan guarantees of which passenger airlines will have access to $50bn and cargo airlines $8bn. In addition air carriers are granted a holiday against aviation transport and fuel taxes.

However the terms of the relief package will have strings attached that may be unpalatable to some. The grants will be available for airlines to support their payroll (based on employee costs as reported in Summer 2019) as long as they do not impose involuntary furloughs or discontinue service to any airport served at the beginning of March until at least the end of September. Loans and loan guarantees would be subject to conditions that include that airline employees with earnings over $425k in 2019 will have their maximum total remuneration frozen for two years (unless subject to a collective agreement) and severance pay in that period would be limited to twice the total remuneration in 2019. Needless to say there could be no shareholder dividends or share buy-back programmes. Furthermore, the Government will have the right to participate in "the gains of the eligible business or its security holders through the use of such instruments as warrants, stock options, common or preferred stock, or other appropriate equity instruments". In other words partial nationalisation.

In the UK the Government had considered providing an industry-wide package of support, but gave up when it found that the in-fighting industry players could not themselves agree to what form this should be. The Treasury has left the airlines to find their own private sources of cash, but stated that it would help individual carriers "as a last resort" on a case by case basis. In any case it had already allowed regional carrier Flybe (which had been financially challenged for many years) to go to the wall at the beginning of March. But the UK is perhaps unique. In the shenannigans over Brexit, it abandoned the requirement for substantial national ownership of airlines, leaving British airlines to prove that they were majority EU owned.

But there is also a political side to

the equation. The *Financial Times* reported one government figure as having said: "There are obvious reasons why Virgin and easyJet aren't the first on our wishlist of companies to help. There are the perennial questions over Richard Branson's tax affairs and then there's the fact that Stelios took that massive dividend [of £60m]. I'm not saying it's impossible but the optics aren't great." Apparently, there are also feelings among Conservative MPs that supporting British Airways would mean giving money to a Spanish company, while most of the large airports are also majority owned by foreigners. At least IAG has cancelled its proposed final dividend for 2019.

Meanwhile, France and the Netherlands have said they will do "whatever it takes" to help Air France-KLM (in which the respective governments each hold 14% of the equity, and the French Government, courtesy of the *Loi Florange*, double the votes). One possible scenario appears to be that the operating companies would get state-backed loans, €4bn for Air France and €2bn for KLM, for the moment putting aside the two governments' disputes over the direction of the Group. But the French Transport minister, Jean-Baptiste Djebbari, said that the nationalisation of Air France "is one possibility among others that we are not ruling out", while Pieter Elbers, KLM CEO, has felt it necessary to deny rumours of a break with the parent group saying "we are not working on disentanglement scenarios". Interestingly, despite EU consumer law, the Netherlands has allowed refunds of cancelled tickets to be made in vouchers rather than cash.

A similar view is being taken by Germany, which has also likely to acquire Condor in the realisation that LOT's agreed acquisition will no longer go ahead. At the same time Lufthansa is in negotiations with the German Government for state aid, and is said to be reluctant to consider any equity involvement. Meanwhile its financial management has been dealt a blow by the sudden immediate resignation of its CFO, Ulrik Svensson, for health reasons. But it is taking the opportunity to introduce a massive (overdue?) restructuring: decommissioning 40 aircraft (six A380s, 10 A340s,five 747s and 21 A320s) and closing Germanwings. When it emerges it will be 20% smaller.

In Italy, there is some strange irony that it has taken a global pandemic to "save" the perennially loss-making Alitalia. The Government finally gave up on attempts to sell the airline that has been in administration for the past three years by formally nationalising with plans to let it re-emerge as an almost irrelevant bit-player, operating a mere 25-30 aircraft (down from 93) and only 3,000 employees (12,000). The European Commission has stated that it would approve nationalisation if done "at market prices", even while it continues an investigation into possible illegal state aid over the past three years. Brussels really doesn't have a clue.

Meanwhile in Singapore, SIA managed to launch a S$15bn rights issue, supported and underwritten by state holding company Temasek and its 52% stake. In contrast in Australia, while airlines have been granted exemption from fees, the Government has baulked at acceding to a request from Virgin Australia for support seemingly deciding that although structurally it wants a competitive (duopolistic) domestic aviation market, should Virgin Australia fail, some other carrier would come in to take its place.

What Irony!

It is faintly amusing that this global crisis is exposing historic rivalries and hypocrisy.

✈ Each of the three network carriers in the USA is pursuing applications for government support. And yet collectively they had lobbied intensely against the Gulf Superconnectors — Emirates, Etihad and Qatar — arguing that they were unfairly subsidised by their respective states. The only airline not to have reduced flying in the last month is Qatar, although it did admit it would run out of money in only a couple of weeks.

✈ British Airways, the UK's former state-owned national flag carrier has had a sometimes not-too-friendly rivalry with Virgin Atlantic and its flamboyant founder Richard Branson for the best part of thirty years. But it is Virgin (equally owned by Branson and Delta) who is going cap-in-hand to the government for a bail-out.

✈ The Italian Government is doing exactly what a rational investor would do, although in the pre-Covid world it had refused to sell the airline on these terms. It is culling the fleet and decimating the staff, reducing a once proud carrier to an irrelevance.

✈ In the Antipodes a war of words erupted between Qantas and Virgin Australia — with Qantas CEO Alan Joyce publicly suggesting that its domestic rival should not be nationalised apparently saying "governments should not look after the badly managed companies" and "are definitely not there to support a company owned by Singaporeans, Chinese, Abu Dhabi and a British billionaire". In an effort to diffuse the conflict between the airlines, Rod Sims, head of the ACCC has completely negated the traditional role of a Competition Authority, saying "we really need companies working together" and "talking about survival of the fittest could be seen as quite unhelpful".

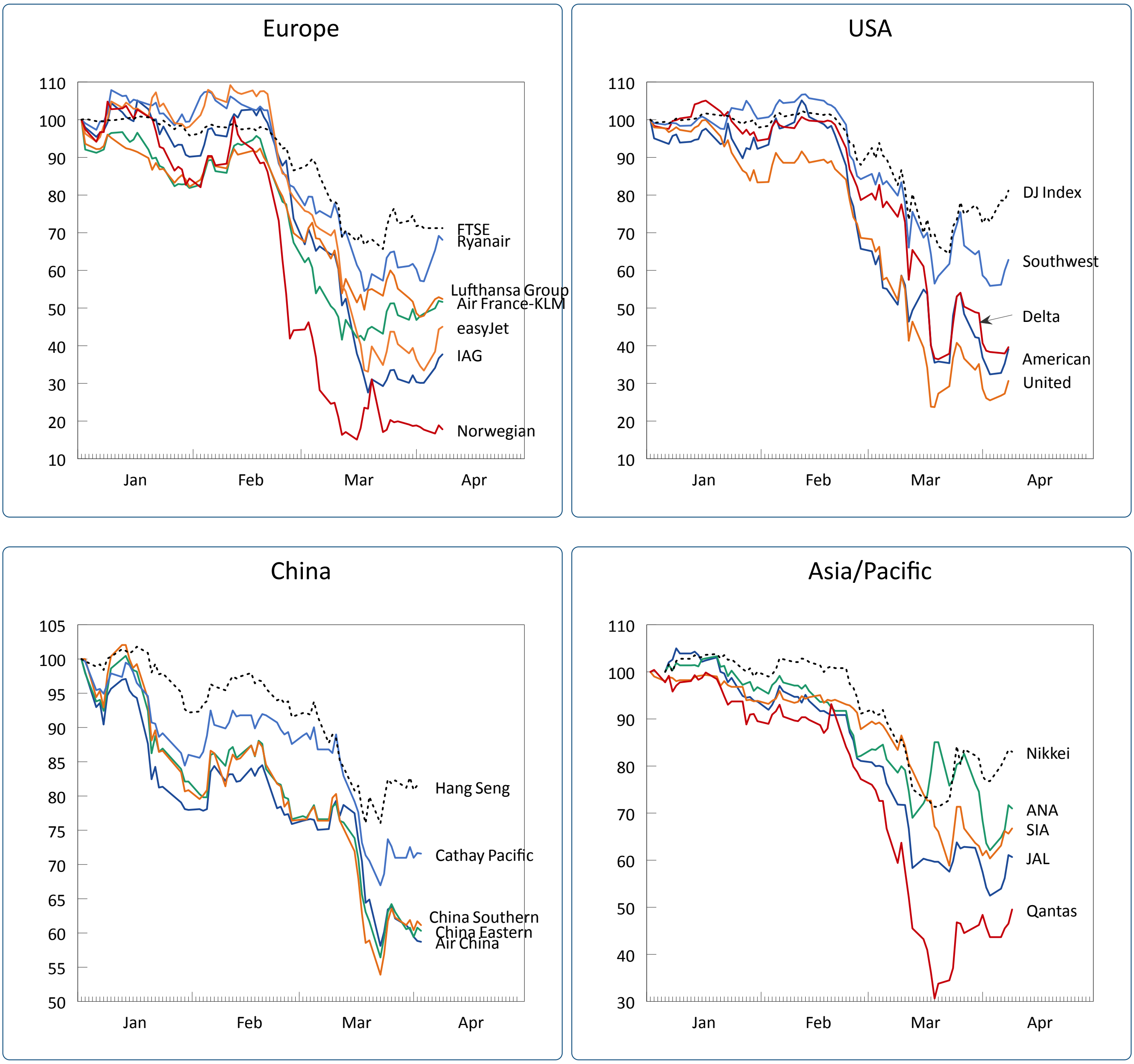
Environmental Considerations

The industry has spent a considerable amount of time and effort in recent years to try to show its commitment to reducing its net carbon footprint. While the debate has been most apparent in Europe, with the development of the *flygskam* movement, the issue of global warming is being taken seriously. One of the more interesting elements of the debate in the US over financial support to the airlines was an attempt by Democrats to table amendments to the CARES Act that would require stiff targets for the reduction of emissions as a price for financial support to airlines.

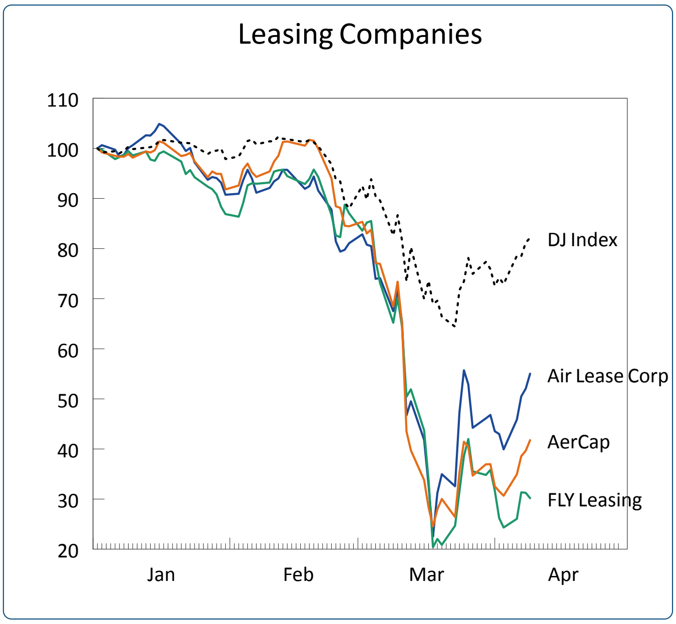
In a way, the same matter is a restraining factor in Europe against any political move for renationalisation (except in Italy).

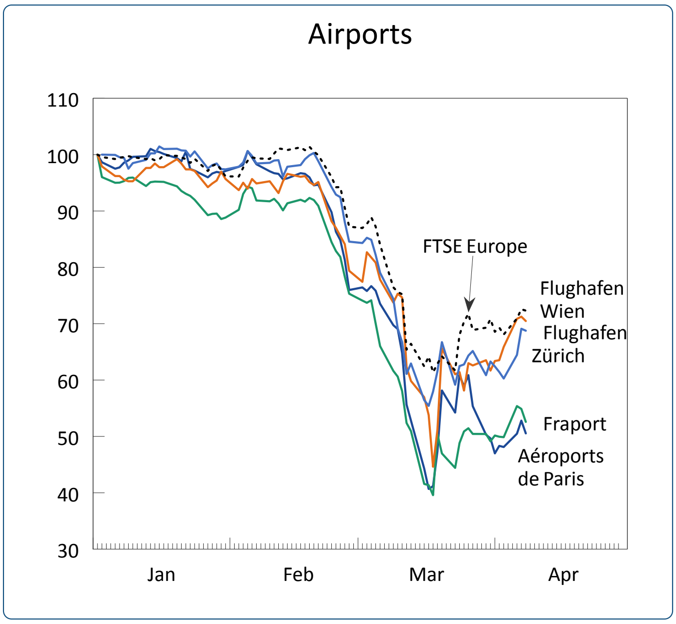
Intriguingly for the industry, its own international remedy, CORSIA (see *Aviation Strategy*, June 2019), is designed to stabilise net carbon emissions at *2020* levels (based on the average emissions for 2019-2020). If, as now seems likely, the net emissions this year will be significantly lower than would normally have been expected, the restraints on air traffic growth in the medium term will have increased substantially.

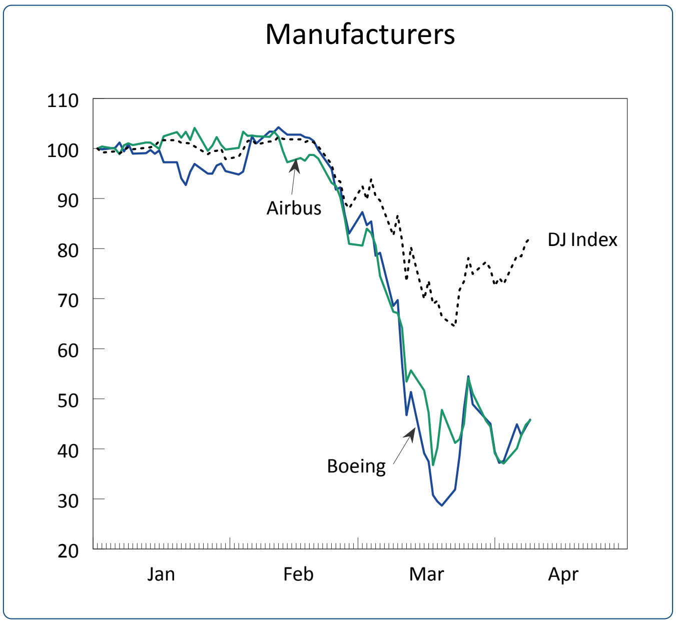
AIRLINE SHARE PRICE PERFORMANCE 2020



SHARE PRICE PERFORMANCE 2020







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