Introduction

The aviation industry, especially the air transport and airline industry has undergone massive change in past decades. In the last 40 years, cargo volumes have increased fourteen times and passenger numbers have risen by ten times. The real cost of air travel has fallen by about 60%. Airframe and engine technology improvements have doubled fuel efficiency and unit cost of air transport has more than halved over the same period.

However, after the most recent prolonged up cycle, there is general agreement amongst industry analysts that the airline industry has peaked and a slow correction or moderation is underway.

Macroeconomic headwinds are continuing to build, creating challenges for weaker airlines to maintain growth and profitability. There is greater potential for more extreme volatility. Further bankruptcies and consolidation in the airline market are expected, while M&A activity is predicted to increase among leasing companies.

The industry fundamentals remain. During that 40 year period, aircraft supply increased, US domestic markets in the late 1970s, followed by international markets from the early 1990s, have become less heavily regulated (a relative term). As a result, there have been many new airlines, whilst in reality only a few have disappeared (albeit high profile departures). As a result, the number of commercial airlines, flying Western-built jets, has risen to over 1,300.

But the picture is mixed. It is an industry where barriers to entry are low, economies of scale in operations are limited, access to distribution channels is easy and customer switching costs are low. Not many moats here.

Sadly, also for investors, during that same 40 year period, the net profit of the airline industry worldwide has averaged only 0.1% of revenues. Over the past 10 years, for example, investors have seen their capital earn USD$20 billion a year less than it would have if they invested it elsewhere. Even at the top of the last full economic cycle for the aviation sector (2010), over USD$9 billion of investor value was destroyed. During that year, the industry's USD$18 billion profit was equal to a margin of just 3.2%, at a time when the average cost of capital was 7-8%.

But, currently, over USD$500 billion of capital is invested in the industry. Many established airlines have used the recent 'boom time' to shore up balance sheets and beef up cash reserves in order to capitalise on the coming opportunities as they seek to expand into routes perhaps freed-up by weaker competitors, who will be reducing networks and capacity, or exiting the market altogether.

Worldwide airline Industry	2018	2019E	2020F
Africa			
Net post-tax profit, $billion	-0.1	-0.2	-0.2
Per passenger, $	-1.09	-2.13	-1.93
% revenue	-0.7%	-1.4%	-1.3%
RPK growth, %	6.1%	3.7%	3.8%
ASK growth, %	4.4%	4.2%	4.9%
Load factor, % ATK	60.7%	59.6%	58.5%
Breakeven load factor, % ATK	59.8%	59.0%	57.8%
Asia-Pacific			
Net post-tax profit, $billion	6.1	4.9	6.0
Per passenger, $	3.74	2.92	3.34
% revenue	2.4%	1.9%	2.2%
RPK growth, %	9.5%	4.7%	4.8%
ASK growth, %	8.8%	4.4%	5.5%
Load factor, % ATK	72.5%	72.0%	71.7%
Breakeven load factor, % ATK	68.5%	68.8%	67.6%
Middle East			
Net post-tax profit, $billion	-1.5	-1.5	-1.0
Per passenger, $	-6.69	-6.84	-4.48
% revenue	-2.7%	-2.7%	-1.7%
RPK growth, %	5.0%	2.6%	2.5%
ASK growth, %	5.9%	1.9%	3.2%
Load factor, % ATK	65.2%	62.2%	61.8%
Breakeven load factor, % ATK	68.2%	65.5%	64.4%
Latin America			
Net post-tax profit, $billion	-0.8	-0.4	0.1
Per passenger, $	-2.78	-1.32	0.42
% revenue	-2.3%	-1.1%	0.3%
RPK growth, %	7.0%	4.2%	4.3%
ASK growth, %	7.3%	3.0%	4.6%
Load factor, % ATK	67.9%	69.4%	69.2%
Breakeven load factor, % ATK	66.0%	66.9%	66.7%
North America			
Net post-tax profit, $billion	14.5	16.9	16.5
Per passenger, $	14.66	16.81	16.00
% revenue	5.7%	6.4%	6.0%
RPK growth, %	5.3%	3.8%	3.8%
ASK growth, %	4.9%	2.3%	5.1%
Load factor, % ATK	64.9%	65.4%	64.8%

Those headwinds analysts talk about, are, over the next 12- 24 months, expected to shake up the aviation industry environment. For some, these headwinds will prove a tailwind to further growth. Let’s see if it's worth our while investing?

The Dynamics

Let’s try to make sense of how it all works. But before we start, let me point out the aviation industry is massive. Each sector is it’s own speciality, to cover all would be impossible in a report this size. So, whilst touching on all aspects I will mainly be concentrating and referring to airlines. They are the main drivers after all!

So, In basic terms..

Rivalry in the airline industry is highly intense. This rivalry is driven by a number of underlying characteristics of air transport. At its core, rivalry is based on the buildup of capacity which never leaves the market. That capacity eventually drives pricing decisions that fail to support attractive returns. It’s often a race to the bottom in terms of margins and profits. In other words, it’s a cyclical industry.

Airlines compete by making a number of strategic choices, choices often following different timelines of years, months and hours:

Firstly, an airline has to choose its overall capacity, for example, via the size of its aircraft fleet. This choice is often set over long time periods, brought about by lags in aircraft delivery and building the necessary company infrastructure. It also includes choices about the amenities to include on an airplane. Customers like choice and luxury, but at a cheap price.

Secondly, the airline has to choose how to allocate that capacity across its different connections. These choices tend to be set for a period of up to six months. Although, changes in aircraft size on existing connections can be made with higher frequency.

Thirdly, the airline has to set prices for each connection. These prices can be changed frequently, sometimes even many times during a day. Also, incentives such as frequent-flyer programs have been introduced to create more customer loyalty, they have some effect, for example, allowing airlines to charge higher prices on connections through their hubs. Average cost per available seat kilometer (ASK) is also decreased in the proportion to the size of the aircraft, this has to be taken into account.

All these things are interlinked, size drives price, price drives capacity, capacity drive price and so on.

Also, when setting capacity, airlines are faced with a number of incentives encouraging them to make aggressive choices. For example, buying more planes gives higher rebates from manufacturers. And operating larger planes reduces costs per passenger.

Returns on free capacity in periods of high demand are high and fully accrue to airline owners (they can charge more for seats etc and make a bigger profit), while losses in periods of low demand are limited to the money previously invested in that route. As a result, airlines end up acquiring too much capacity and operate many connections which, at times, cover only their marginal costs of operation, let alone the capital cost already incurred.

Routes with higher density can support larger aircraft, which in turn enable lower costs and prices that can attract additional customers. When making pricing decisions, airlines have powerful tools, such as yield management systems, to maxi- mize profits. But competition limits the payoffs of these tools, whilst individually every airline is better off using them, they lead to more intense price-based competition. Airlines end up pricing more of their seats at marginal costs per passenger. Pushing down prices.

These dynamics drive the business model of network airlines. Small feeder flights from regional airports fly customers into hubs that make larger planes economical to fly on higher density, longer-haul connections. Hubs are also a key driver of sharing business amongst companies. Additional feeder flights operated by other airlines come into the same hubs, everyone is happy...until they are not.

The State of the Industry

To start with, remember, these 40 year figures I have quoted in my introduction are average numbers. Meaning some companies are earning below these figures and others are above. A small group of airlines do consistently generate returns that exceeds their costs. But, most analysts seem to consider there to be no simple, obvious answer for their success.

So, let’s, firstly, examine some broad data to find out why. To do so, I will first look at some historic figures and examine the last economic cycle for the aviation industry. I am doing this because I am a long term investor. So, I want to discover what might happen *long term* within the industry, not just the next 2 years. Later we will look at the current profitability of certain airlines in depth and project that forward. But at the moment please remember I am going to go back over a few years.

As mentioned above, in the past 40 years, passenger numbers, measured by RPKs (revenue passenger kilometers), have expanded tenfold. This is an expansion three times greater than the growth of the world’s economies. Air travel has risen broadly in line with world trade during the past 40 years. It has been one of the fastest growing economic sectors.

Over the past 40 years the real cost of providing air transport services has also fallen by more than 60%. The inflation-adjusted price for customers has also fallen by a similar amount.

In reality, the pattern of declines in real travel costs and real unit operating costs reflects fuel and cost efficiency of new aircraft models introduced over that time period. Aircraft have economic lives of 20-30 years (average 25), so new, more efficient models take time to impact fleet efficiency. Nonetheless, the scale of fuel-efficiency improvement in the past 40 years is very similar to the fall in unit costs and the decline in the real cost of air transport.

Global urbanization is also key to the current state of development within the industry. The air transport network is all about linking cities and urban areas. The 26 'megacities' of the world, with populations in excess of 10 million, account for more than 20% of all air travel worldwide. There are 62 global urban areas with populations of 5 million or more, these generate 40% of all air travel worldwide. Most growth in capacity over the past 40 years has taken place with a major hub city at one or both ends of a route. Growth in services between smaller cities has been much slower.

But, analysts consider today's large markets in the US and Europe are approaching saturation, with the industry-wide picture concealing the current concentration of air services between megacities in OECD economies.

In other words, the 15 megacities in Asia and the 6 in Latin America are relatively underserved and promise further substantial network growth in the coming decades. Brazil, Russia, India, China and South Africa (BRICS) economics have very underdeveloped travel markets and are likely to be a very large source of new travel demand in the decades ahead. However, travel markets do mature. Academic evidence suggests that once real GDP per capita reached USD$15,000- $20,000 the number of trips by air per head of population levels out.

Profitability

In providing the air transport services, described above, the worldwide airline industry has generated an average annual post-tax profit, net of debt servicing costs, of just 0.1% of revenues over the past 40 years. In other words, the airline industry has been able to pay its bills, renew its fleet, and service its debts. But, there has been almost nothing left to pay its owners or shareholders.

Airlines in all regions and of all business models, with some exceptions, fail to generate a return on invested capital (ROIC) equal to their weighted average cost of capital (WACC). Returns have been sufficient to pay the bills, renew aircraft fleets and service debt. Owners and shareholders see their capital eroded, consistently.

Why is the cost of capital important? Because, with low interest rates and attractive aircraft finance available, if you are failing to make money, something must be wrong with the business model. Plus what happens if credit dries up?

But Aviation isn't just about airlines. Four sectors, within the industry, generated double-figure returns during the last 2002 -2009 airline cycle. Two others make their cost of capital. Airports and the manufacturing sectors just failed to generate returns equal to their cost of capital during the 2002-2009 cycle. Airlines get the lowest returns in the whole supply chain. Computer Reservation Systems (CRS) the best.

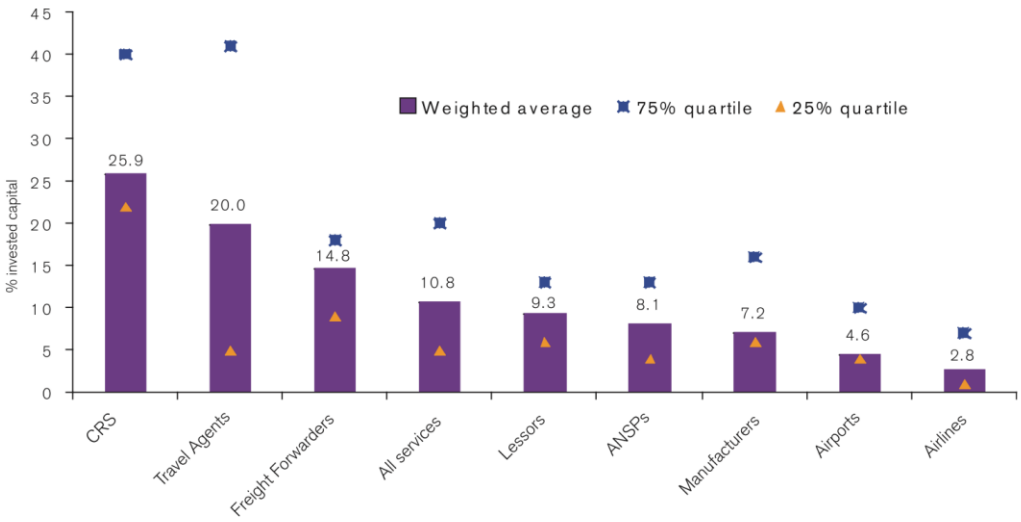


Chart 22: Excess returns are earned in parts of the supply chain
Source: McKinsey & Company for IATA

The low ROIC for the airport sector is historically, the result of the US and Japanese airports, which are run by national or state governments to deliver a low investment return. In Europe and non-Japan-Asia airports appear to generate returns in excess of WACC, at least over part of the cycle.

A higher returns for higher risk, in terms of earnings volatility, does not always appear to be the case. In fact, the sector with the second most volatile earnings, airlines, has the lowest return. Analysts consider the high-return sectors are highly concentrated, so the excess returns may well be due to a lack of competition.

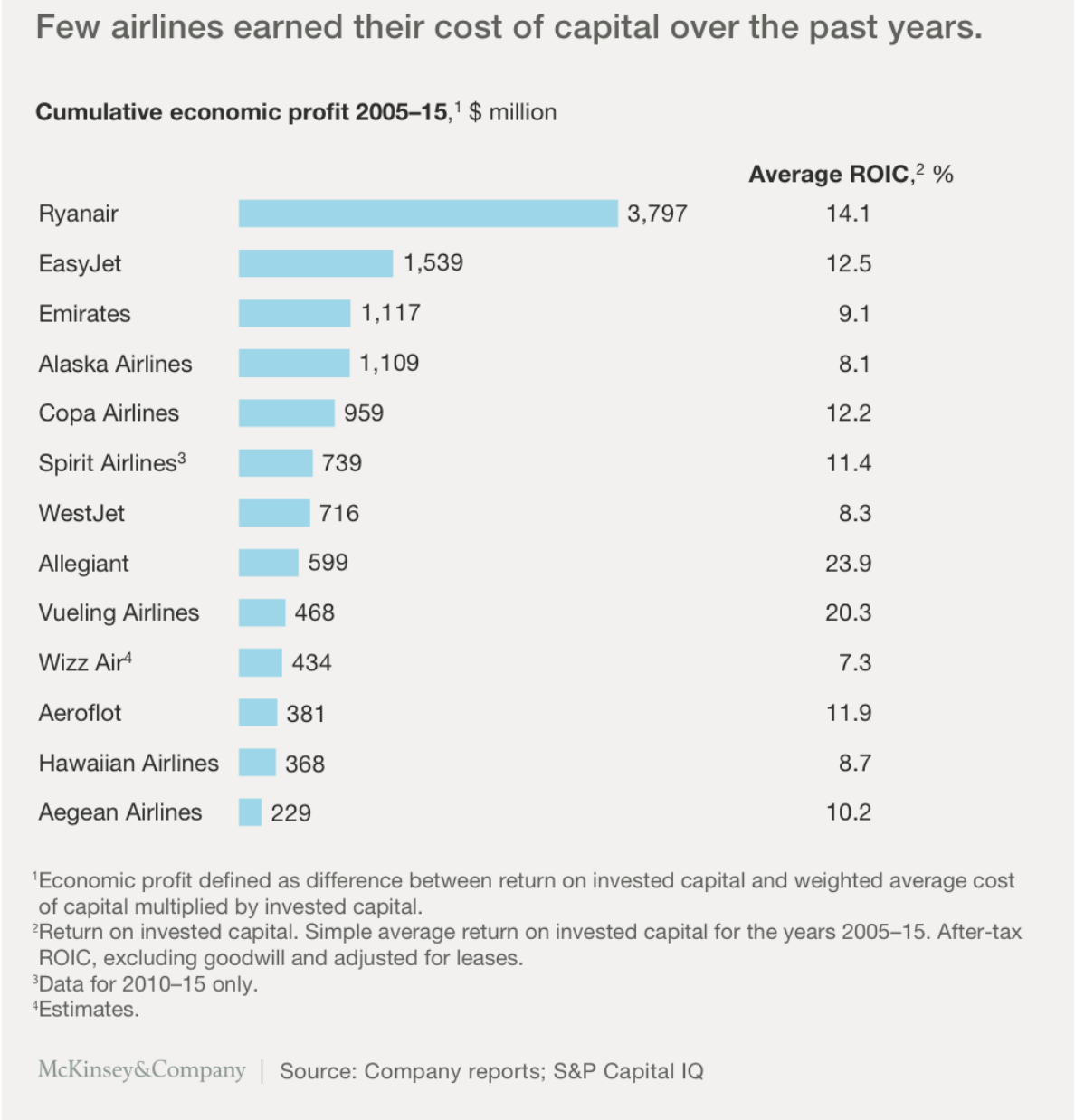
However, there is actually little invested capital in the high-return sectors. As a result subpar returns in the airlines sector, where most capital is invested, dominate the whole supply chain,d istorting the results. On average through the 2002-2009 business cycle the industry as a whole destroyed USD$19 billion of shareholder capital each year.

So, analysts suggest that most airlines have failed to earn their cost of capital over airline business cycles of which tend to last 8-10 years. This has not been for the lack of trying: airlines have streamlined operational cost (often through the outsourcing of activities like maintenance and ground handling), cut services considered non-core, introduced much more sophisticated yield management, dramatically increased aircraft utilization rates, added additional revenue streams, for example, charging for previously included services; selling

additional products and services to passengers, they have introduced wide-ranging customer loyalty programs, and established alli- ances with global reach. Remember though, we are talking on average here. Not all airlines are the same.

Still, historically, margins across the industry are abysmal compared to other industries.

Figure for 2005-2015, a difficult period for all industries, not just airlines.



Also, the data on airline profitability is consistent with the academic hypothesis that all segments are subject to the same underlying economics. The airlines that generated average EBIT margins of 8% or more during the 2000s, covered all continents (except Africa) and many types of airline operating models, from low cost carriers, to regional niche players, to more traditional network airlines.

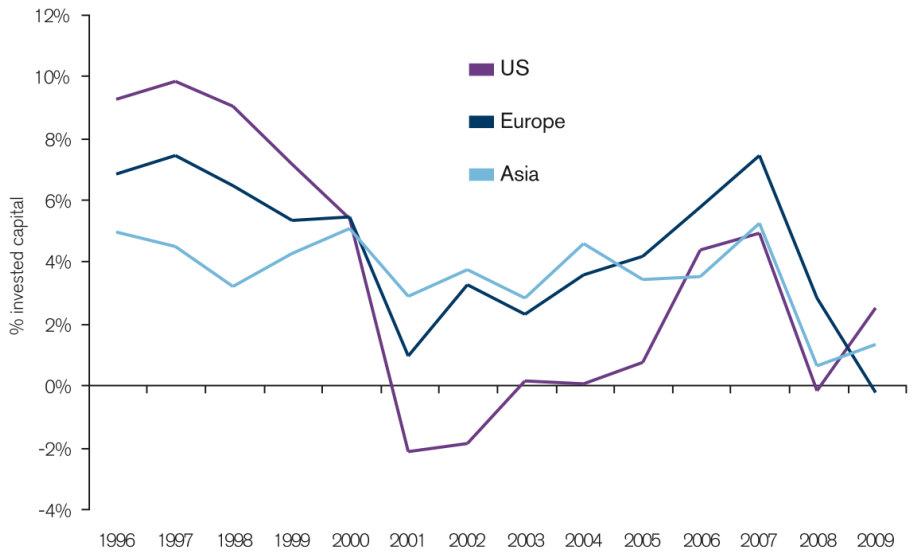
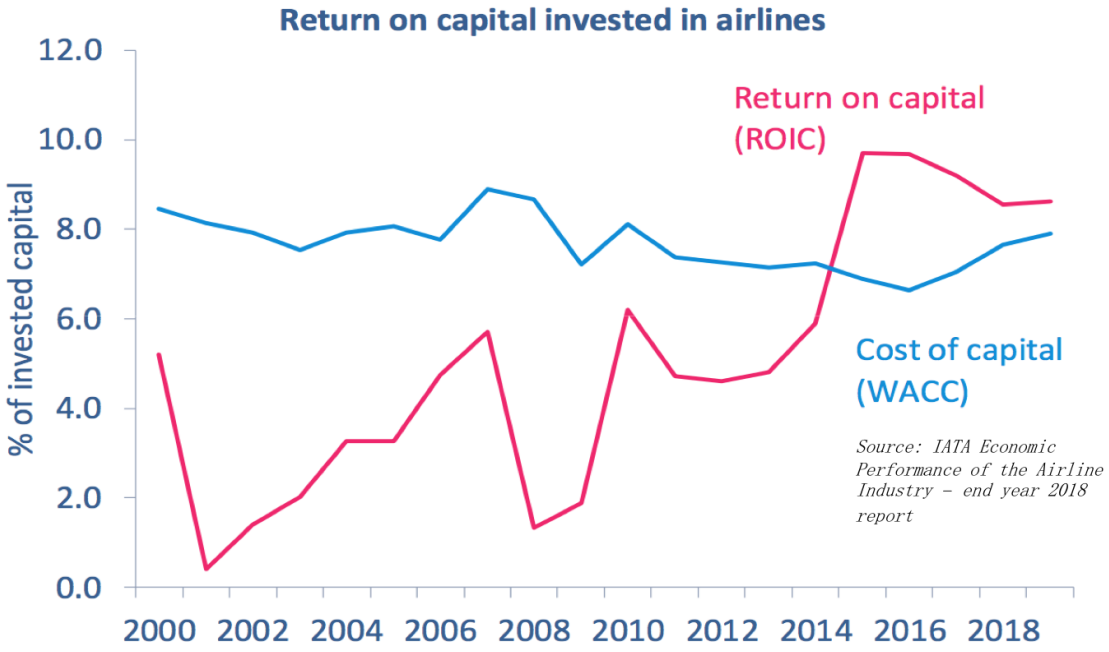
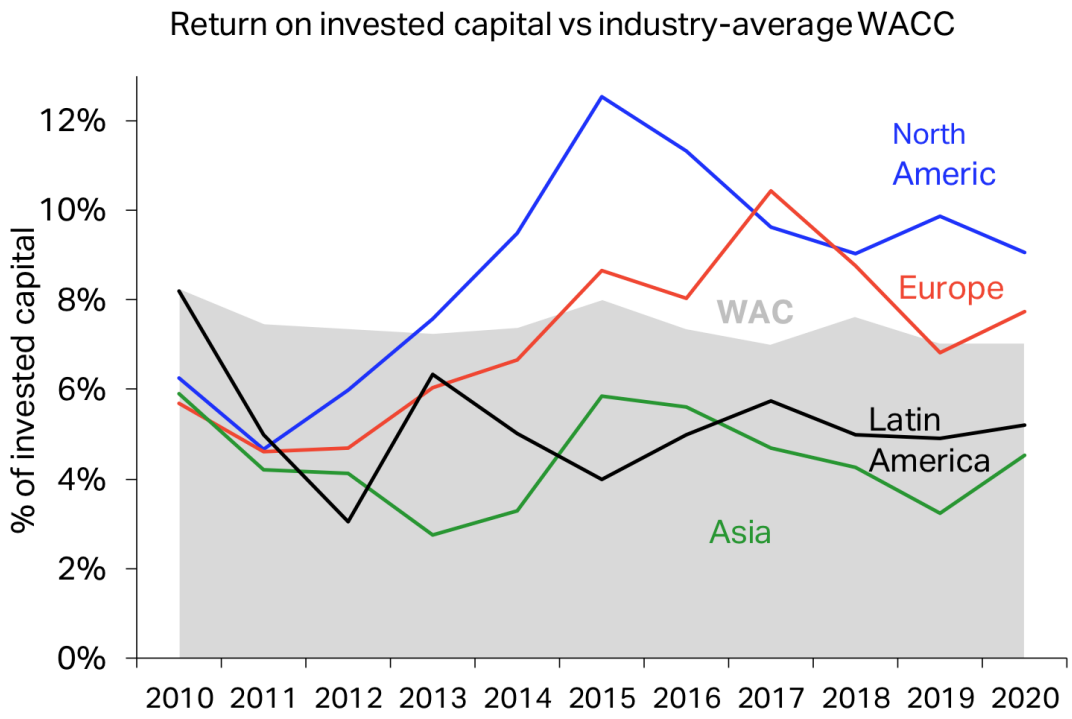


Chart 31: Return on capital for airlines by region, % of invested capital
Source: McKinsey & Company for IATA

Some more recently dated charts, better but not ‘wow’!

Notice the lines coming back together, below


Return on capital invested in airlines
12.0
10.0
8.0
6.0
4.0
2.0
0.0
% of invested capital
Return on capital (ROIC)
Cost of capital (WACC)
Source: IATA Economic Performance of the Airline Industry – end year 2018 report
2000 2002 2004 2006 2008 2010 2012 2014 2016 2018


Return on invested capital vs industry-average WACC
12%
10%
8%
6%
4%
2%
0%
% of invested capital
North Americ
Europe
WAC
Latin America
Asia
2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020

Worldwide airline Industry	2018	2019E	2020F
Industry ROIC, % invested capital	6.5%	5.7%	6.0%
North America	9.0%	9.9%	9.1%
Europe	8.8%	6.8%	7.7%
Asia-Pacific	4.3%	3.2%	4.5%
Latin America	5.0%	4.9%	5.2%
EBIT margin, % revenue	5.7%	5.1%	5.5%
Net post-tax profits, $billion	27.3	25.9	29.3
% revenues	3.4%	3.1%	3.4%
$ per passenger	6.22	5.70	6.20
Adjusted net debt/EBITDAR	4.50	4.60	4.50

Note: ROIC = Return on Invested Capital, EBIT = Earnings Before Interest and Tax. Debt adjusted for operating leases. **Current year or forward-looking industry financial assessments should not be taken as reflecting the performance of individual airlines, which can differ significantly**.

Worldwide airline Industry	2018	2019E	2020F
Spend on air transport*, $billion	845	873	908
% change over year	7.5%	3.3%	4.0%
% global GDP	1.0%	1.0%	1.0%
Return fare, $/pax. (2018$)	327	307	293
Compared to 1998	-60%	-62%	-64%
Freight rate, $/kg (2018$)	1.92	1.77	1.66
Compared to 1998	-61%	-64%	-66%
Passenger departures, million	4,378	4,540	4,723
% change over year	6.9%	3.7%	4.0%
RPKs, billion	8330	8680	9038
% change over year	7.4%	4.2%	4.1%
FTKs, million	262	254	259
% change over year	3.4%	-3.3%	2.0%
World GDP growth, %	3.1%	2.5%	2.7%
World trade growth, %	3.7%	0.9%	3.3%

Note: RPK = Revenue Passenger Km, FTK = Freight & mail Tonne Km
GVA = Gross Valued Added (firm-level GDP). *Airline revenue + indirect taxes.
Sources : IATA, ICAO, OE, CPB, PaxIS, CargoIS

However, after all this doom and gloom and to bring things more up to date, a recent industry survey and analysis of the sector by KPMG, found North America was viewed with the most optimism by all market players. KPMG found confidence that the major US carriers, in particular, were considered to be on a more secure financial footing than ever before and are well prepared for any coming downturn within the industry.

KPMG also found, there was also a sense that South American countries may be coming out of a prolonged slump, despite the significant political change in the region and signs of stress among some of the main carriers.

Though still regarded as a strong market, Europe presented a very mixed picture for many.

Overall, the KPMG survey found agreement that passenger growth would remain strong but given market stresses, further airline issues and consolidation were likely. The Middle East was also a concern, partly due to the geopolitical issues but mostly due to the big three Gulf carriers all vying for the same traffic and the fact that their business models are apparently showing signs of stress.

Obviously, later we will look in depth at some of these airlines.

Costs

Understanding cost differences is critical for airlines: ticket prices have been falling throughout the entire history of the business, declining on average by 2 percent annually over the past 20 years. Newer technology, larger aircraft, and increasingly efficient operations continually drive down the cost of running an airline. Given these trend lines and the industry's highly competitive nature, passengers have become used to lower prices. Good companies must therefore have a close eye on costs.

Examples of Costs

Boeing 757-200 Flight Operating Costs

Airline	Number of Aircraft	Seats	FOC per Block Hour	FOC per Seat Hour	Utilization (hrs/day)	Stage Length (Miles)
American	101	188	$ 2,568	$ 13.66	10.3	1460
Continental	34	179	$ 2,568	$ 14.35	12.1	1860
Delta	101	182	$ 2,357	$ 12.95	11.6	984
America West	12	190	$ 2,065	$ 10.87	13.1	1167
Northwest	48	191	$ 2,260	$ 11.83	11.7	1137
Trans World Air	20	179	$ 2,656	$ 14.84	11.8	1405
United	98	186	$ 2,684	$ 14.43	11.2	1281
USAir	34	182	$ 3,069	$ 16.87	11.1	1254
AVERAGE	458	186	$ 2,481	$ 13.34	11.3	1252

FOC Comparison: Selected Aircraft

A/C Type	Seats	FOC / block-hr	FOC / seat-hr	Average stage(mi)	Daily block-hrs
DC9-30	100	$1973	$19.73	472	8.1
A320	148	$2270	$15.33	1191	11.7
B727-200	150	$2555	$17.03	704	8.4
B757-200	186	$2550	$13.71	1252	11.3
B747-400	375	$6455	$17.21	4065	12.4

Cost Structures

Input cost structure

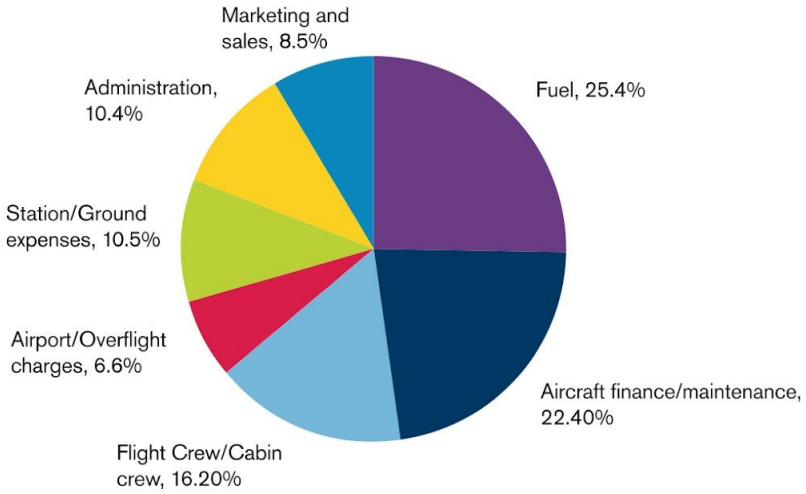


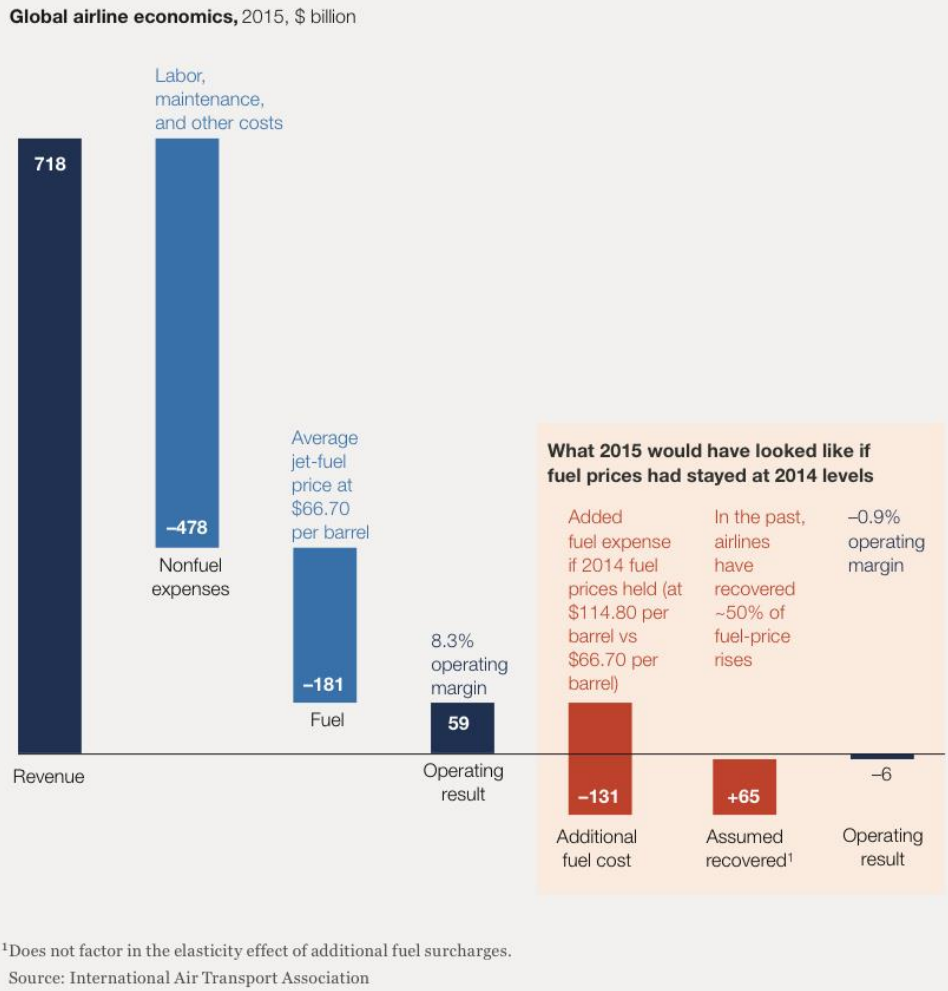
Chart 27: Breakdown of airlines' total operating costs
Source: Doganis, 2010

The major expenses that affect companies in the airline industry are labour and fuel costs. Labour costs are largely fixed in the short-term, while fuel costs can swing wildly based on the

price of oil. For example, Whilst the chart above shows 25% fuel costs, I have seen others with figures of 50%!

For this reason, analysts pay more attention to fuel costs in the near-term. Two- thirds of the costs of flying an airplane are fixed, so changes in fuel costs can swing a flight from profit to loss depending on how many people are on the flight.

Exhibit 1 **Profits are mostly driven by the drop in jet-fuel price.**

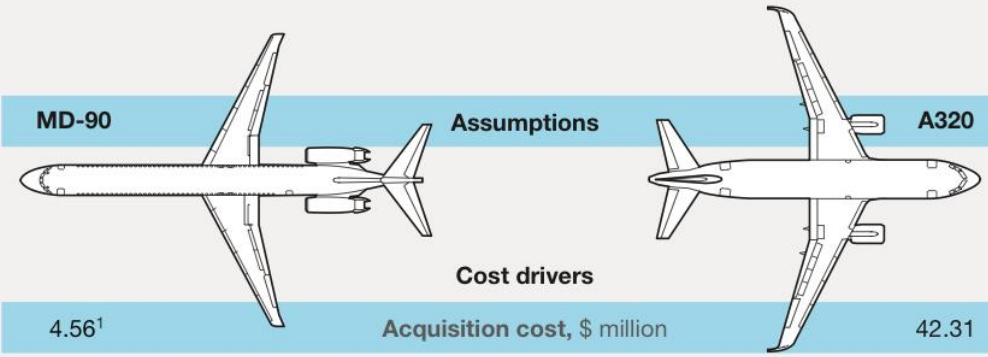


[1]Does not factor in the elasticity effect of additional fuel surcharges.
Source: International Air Transport Association

Fuel is the only major cost item that has become significantly larger over time. Distribution (sales) costs have fallen (see below), while all other major cost categories have remained roughly stable as a share of total operating costs.

Exhibit 2

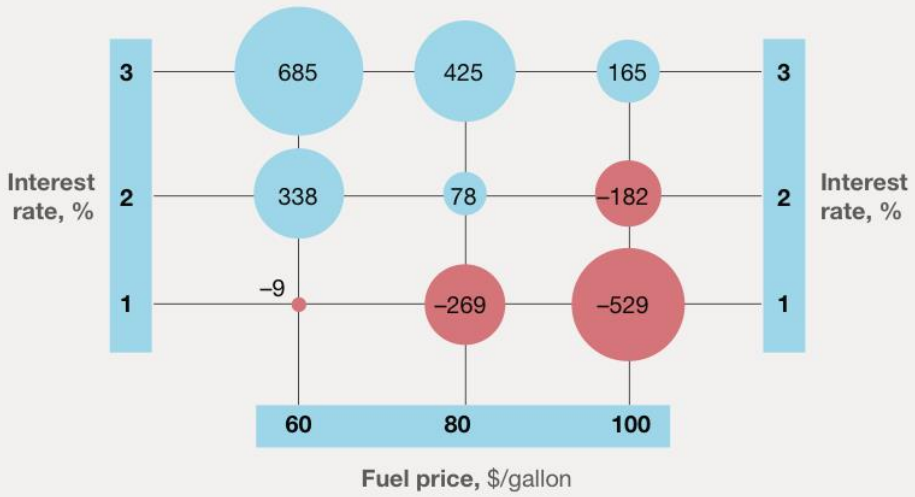
An older fleet pays off when fuel prices are low and interest rates are rising.



MD-90	Assumptions	A320
	Cost drivers	
4.56[1]	**Acquisition cost,** $ million	42.31
715	**Maintenance, repair, and overhaul cost**, $/BH[2]	600
900	**Fuel burn,** gallons/BH	780
7.5	**Utilization,** BH/day	12.5
10	**Depreciation period,** years	20
0	**Residual value,** $ million	8.1

Operating cost MD-90 vs A320 aircraft,[3]
$ thousand per annum

MD-90 advantage ● MD-90 disadvantage ●



[1]$2.06 million acquisition (1999 vintage—latest year produced) and $2.50 million assumed refurbishment.
[2]Block hour.
[3]Considers only fuel expense; maintenance, repair, and overhaul cost; and ownership cost (depreciation, interest cost assuming full debt financing) in 1st year.

McKinsey&Company | Source: Aircraft Value Analysis Company; Airline Monitor

4

Marketing Costs

Chanel costs €	Large Home Market-47% direct		
	Indirect	Direct	Blend
Distribution	10.48	2.56	6.75
Payments etc	2.84	5.39	4.04
Ancillaries	0.06	0.06	0.06
Cust Acquisition	0.83	4.55	2.58
Total	€14.21	€12.56	€13.43

Distribution

Distribution is basically about selling and booking online. A system to allow the distribution of airfares through third parties (this is a mass simplification, apologies). It's a complex subject in its own right, best not covered in depth in this report.

The most famous Global Distribution System companies (GDS) are Amadeus, Sabre and Travelport (private company) there are other smaller regional GDS systems in specific markets. For example, Travelsky is a state owned company in China, and KIU System is a GDS used in Latin America.

The Industry body for airlines the IATA is currently setting up a global standard for GDS called New Distribution Capability. Today, airlines are offering a wide variety of products and services on their websites for business travellers, for example, early boarding, preferred seating, a day pass for an airline lounge and so on. But Travel Management Companies (TMCs) using GDSs are not always aware of the full range of airline products on offer, and airlines cannot customise the offer based on who is making the request.

So, in future, all airlines will use the same IATA-verified standards, which means that third-parties, GDSs, TMCs, procurement departments, plus new entrants, can access the same content that airlines are selling directly, and redistribute them on the airlines' behalf.

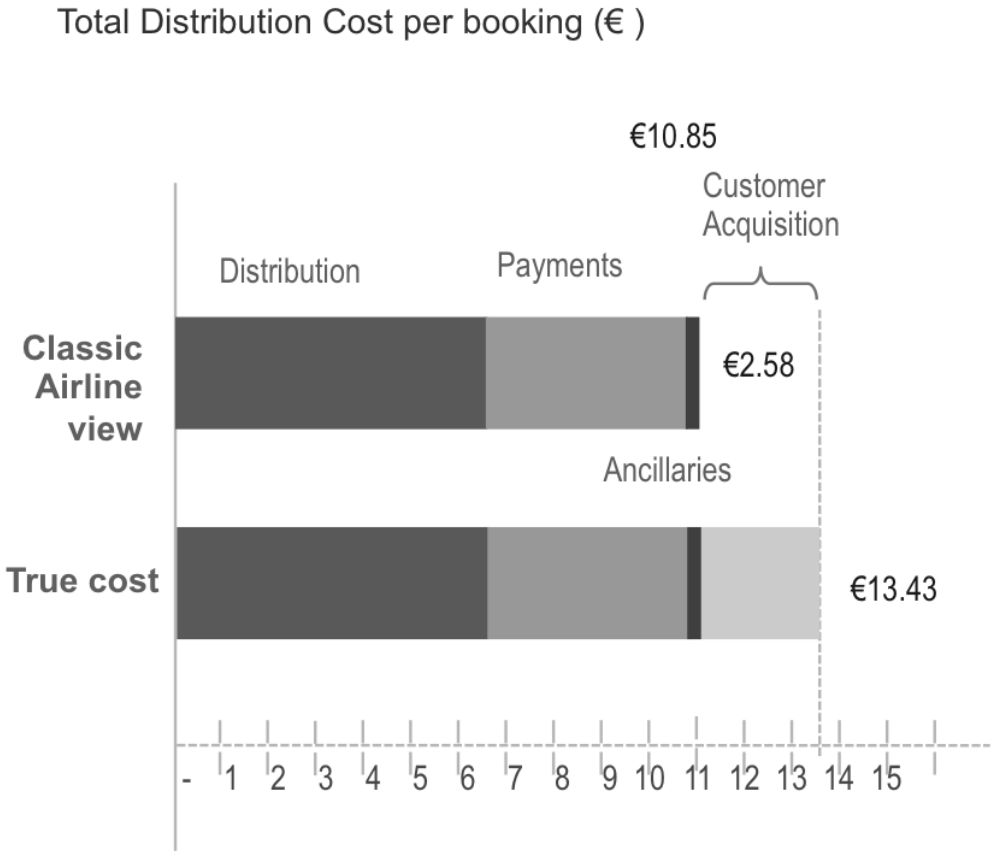
Some people in the industry believe that ultimately NDC means the airlines can charge more if there is less transparency with fares, due to complexity around the booking process which makes it harder to compare like for like.

Also, for TMCs and agents, going directly to the airline could end up with more costs being passed on to the traveller, making them less competitive.

Example of distribution costs

Network Airline

(Large Home Market- 47% Direct*)



* Direct Sales comprise:
Web sales (40%) and ATO/CTO/CC (7%)

Source: Infrata

Parts of the Industry

Let’s consider other parts of the aviation industry, with an eye to potential investment opportunities.

Leasing

Aircraft can also be leased from leasing companies, which keeps the aircraft loans off airline balance sheets. Leasing contracts are usually long-term. Leasing companies have grown more and more profitable in recent years. fuelled by low interest rates and increased liquidity within the airline industry.

As passenger numbers continue to rise, airlines have demanded more from aircraft leasing companies, which have grown in scale and number. Leasing is considered a flexible, cost effective way to manage capacity.

In 2018, the leased aircraft portfolio increased by 629 aircraft to 8,109 aircraft, according to analysts, who also identified that 100 new companies have entered the commercial operating lease sector over the past decade.

Large amounts of cash has entered leasing over the past few years, with Chinese banks entering the sector in droves alongside private equity firms. For example, in recent years Zephyrus Aviation Capital (funded by Virgo Investment Group), Cerberus Aviation Capital, Sirius Aviation Capital and Elevate, among others have all been founded.

Merger and acquisition (M&A) activity has also increased across leasing. GIC, the Singapore sovereign investment fund, has invested in turboprop and regional aircraft specialist lessor, Nordic Aviation Capital (NAC), buying shares from both Martin Moller (NAC’s founder) and EQT VI (its partner since 2015). ORIX Aviation took a 30% stake in Avolon, the Carlyle Group bought Apollo Aviation Group, which operates more in the late midlife aircraft space.

TOP 30 LEASING COMPANIES (RANKED BY NUMBER OF AIRCRAFT)				
Manager	Total Portfolio	On Order	Est Portfolio Value ($mn)	Current Rank
GECAS	**1,229**	**369**	**23,602**	**1**
AerCap	1,056	362	32,975	2
Avolon	521	400	18,725	3
BBAM	498	0	20,499	4
Nordic Aviation Capital	471	48	6,285	5
SMBC Aviation Capital	422	196	15,723	6
ICBC Leasing	377	122	15,448	7
DAE Capital	352	1	10,257	8
Air Lease Corporation	336	382	14,559	9
BOC Aviation	331	171	14,051	10
Aviation Capital Group	310	171	8,769	11
Aircastle	246	25	5,533	12
ORIX Aviation	236	0	6,922	13
Unconfirmed Operating Lessor	233	0	6,049	14
Apollo Aviation Group	229	0	3,225	15
CDB Aviation Lease Finance	214	197	7,164	16
Macquarie AirFinance	197	60	4,387	17
BoComm Leasing	195	34	7,562	18
Boeing Capital Corp	194	105	1,608	19
Castlelake	180	0	2,284	20
Goshawk	168	40	6,333	21
Jackson Square Aviation	154	30	6,154	22
Avmax Aircraft Leasing	148	0	402	23
Standard Chartered Aviation Finance	137	0	4,498	24
China Aircraft Leasing Company	133	201	4,579	25
Falko	119	0	642	36
Deucalion Aviation Funds	102	0	1,948	26
Regional One	88	0	309	27
ALM - Aircraft Leasing & Management	84	0	2,860	28
Cargo Aircraft Management	84	0	1,037	29
Elix Aviation Capital	83	0	666	30
Grand Total	**12,263**	**3,526**	**336,886**	

Source: FlightAscend Consultancy

Aircraft portfolio count includes all in service & stored jets and >50 seat turboprops managed by operating lessors, all roles (owner/asset manager). On order aircraft excluded from estimated portfolio value.

Airframe Manufacturers

New aircraft are bought directly from producers, usually with a significant delay between order and delivery. Manufacturers operate globally and concentrate on different size-classes of aircraft. Airbus and Boeing dominate the market for large aircraft on longer routes but also produce some larger single-aisle aircraft operating on shorter distances. For medium-sized aircraft there are a number of additional suppliers including Bombardier, COMAC, Embraer, and Fokker.

Aircraft Engine Manufacturers

GE, Pratt & Whitney, and Rolls & Royce are among the largest suppliers, and operate globally. Customers can usually choose among a number of different engines for a given airframe. Engines account for a significant part of the total cost of an aircraft and a high proportion of the cost of use.

Maintenances, Repair, and Overhaul (MRO)

While many airlines perform maintenance in-house, 60% of carriers outsource at least part of their MRO activities. About 30%-50% of MRO work is estimated to be provided by external suppliers. Among these suppliers are OEMs (airframe and aircraft engine manufacturers), other airline maintenance operations, and independent service providers. MRO companies continue to command strong prices, especially within recent M&A activity,, reportedly averaging 11x EBITDA over the past two years. These prices are due to strong revenue growth in the industry as well as the major order backlogs going forward reported by the major aircraft and engine OEMs.

MRO revenues are expected to rise to USD$84.9 billion by 2022

Fuel

Jet Fuel is provided through a mixture of global and national/local suppliers at airports around the world. Prices have been volatile, and trending higher. Jet fuel now accounts for more than 25% of total airline operating costs compared to less than 15% in 2000.

Worldwide airline Industry	2018	2019E	2020F
Fuel spend, $billion	180	188	182
% change over year	20.5%	4.7%	-3.4%
% operating costs	23.5%	23.7%	22.1%
Fuel use, billion litres	359	363	371
% change over year	5.2%	1.1%	2.3%
Fuel efficiency, litre fuel/100atk	22.8	22.4	21.9
% change over year	-0.9%	-1.9%	-2.1%
CO_2, million tonnes	905	915	936
% change over year	5.2%	1.1%	2.3%
Fuel price, $/barrel	86.1	77.0	75.6
% change over year	29.1%	-10.6%	-1.8%
% spread over oil price	20.3%	18.5%	20.0%
Upstream oil profits, $billion	16	16	16

Note: ATK = Available Tonne Kilometers. Sources: Ascend, ICAO, IATA.

Analysts forecast that fuel efficiency, in terms of capacity use, for example, per ATK, will improve by 2.1% in 2020 as deliveries of new aircraft grow.

Labour

Wages are often negotiated separately for ground staff, cabin crew, and pilots at the level of individual companies. Unions often have a strong position and different unions represent each group. Wage levels differ significantly by location.

Worldwide airline Industry	2018	2019E	2020F
Labour costs, $ billion	182	188	197
% change over year	6.5%	3.5%	4.8%
Employment, million	2.89	2.90	2.95
% change over year	3.1%	0.3%	1.6%
Productivity, atk/employee	516,324	530,201	545,415
% change over year	2.9%	2.7%	2.9%
Unit labour cost, $/ATK	0.122	0.122	0.122
% change over year	0.3%	0.5%	0.3%
GVA/employee, $	96,178	98,483	102,918
% change over year	1.2%	2.4%	4.5%

Note: ATK = Available Tonne Kilometers, GVA = Gross Value Added (firm-level GDP). Sources: IATA, ICAO, ATAG, Oxford Economics

Ground handling services like baggage handling, check-in, cleaning, etc., tend to be local monopolies or duopolies. Traditionally airlines provided a significant share of these services in-house, but over recent years there has been a trend to outsource them to external providers.

Catering services are often provided by specialized companies, either local specialists or larger international groups.

Low Cost Carriers (LCCs) often benefit from lower wage costs, due to the use of smaller local airports and incentives from municipal governments to encourage jobs and tourism.

Customer Management Services

Loyalty programs have become an important element of the airline business. While they are still dominantly organized within airline, there are some examples of where these activities have been organized in separate companies or fully outsourced.

Airports

Airport operators charge fees for gate usage as well as for take-off and landing slots. Most airports remain owned by governments. Privatization has led to the entry of private companies, some of which operate airports around the world. As will be seen later in this report, certain airlines benefit from dominating an airport, usually as a result of historical links.

Debt and Finance

The expansion of the aircraft industry over the recent past has been financed in roughly equal shares through new equity and debt. Equity has been raised from a wide range of investors. The longer- term returns on airline shares have been below the average of major stock indexes, in line with their consistently low profitability over the cycle. Airline shares are highly volatile and tend to attract short term oriented traders.

Debt is provided mainly by banks, often through specialized airline financing divisions. In fact, there are some concerns, by analysts, that provisions under Basel IV will increase costs going forward, through to this category of being a specialist finance. Bank loans are secured against the aircraft owned by an airline.

Direct purchasing of aircraft is financed through loans, often provided by the aircraft manufacturers or with the support of public export-financing agencies. Export-financing is thus far only available to airlines operating outside the home country of the major aircraft producers (more on debt and aircraft finance below).

The weighted average cost of capital for the average airline in normal times is 7%-8%. For the typical airline it takes a dollar of invested capital to generate a dollar of revenue each year. So to generate a return on capital equal to its cost, really the minimum investors will expect, airlines need to generate earnings as a percentage of revenues i.e. an EBIT margin of 8% or more.

However, it's not that simple, EBIT needs to be adjusted for accounting distortions such as operating leases and some hedging. As a result, some of the airlines with EBIT margins of 8% or more do not make it into the list of those airlines creating economic profits. And a few that have lower EBIT margins do create economic profits!

In this instance when I refer to economic profit I mean the excess of returns over cost of capital. It is a rough, rule of thumb, indication of airlines that justify, from a private retail investor's point of view, the capital invested in them.

Aviation debt cash flows are contractual and to that extent are known in advance. However, some forms of investment allow the borrower to repay early. While in many cases borrowers are required to compensate the lender if they prepay, this introduces uncertainty to the level and timing of cash flows.

The following chart outline the main forms of debt used in aviation finance:

Figure 3: this table explores each of these four forms of aviation finance and provides a market example in each case:

Type of debt	Description	Example[6]
ECA debt	These are credits guaranteed by an ECA. They are set on standardized terms, with a maximum tenure of 12 years.	In April 2015, the US Export-Import Bank agreed to support financing for five Boeing 747-8s worth over $984m for Korean Air.
Unsecured bonds	These are publicly issued bonds that are not collateralized on underlying assets. This type of finance tends to be more popular with leasing companies who prefer the flexibility in term and payment profile.	In May 2016, Aercap (an aircraft leasing company) issued $1b of unsecured bonds, rated BBB[7] with a 6-year term, at a yield of 3.988%. The bond was issued at 99.813% of par with a 3.95% coupon.
Secured loans	These are private loans collateralized on underlying aircraft equipment and therefore, unlike unsecured bonds, investors have recourse to the underlying collateral in the event the issuer defaults. Lessors and airlines have differing borrowing requirements; therefore, this form of debt varies depending on the entity to which one lends.	In January 2016, Natixis arranged a $470m recourse facility for Goshawk Aviation. The deal was secured against 22 young narrow bodies, on long-term leases.
Asset-backed security (ABS)	This is a type of structured product typically favored by airline leasing companies. In return for capital, investors are provided with notes entitling them to a stream of coupon and principal payments. Notes are typically issued in tranches, where the tranche relates to the priority of repayment. Notes are collateralized on and met by a large portfolio of aircraft and attaching rental contracts. The leasing company acts as the servicer to the portfolio, dealing with maintenance, repossession and sale of the aircraft.	In August 2016, Castlelake closed a $916m aircraft securitization. Three tranches of notes were issued to investors rated A, BBB and BB[8] with coupons of 4.45%, 6.15% and 8%, respectively. The notes were securitized against a portfolio of 52 aircraft that were on loan to 20 different airlines.
Enhanced equipment trust certificate (EETC)	This is a structured debt instrument issued by a single airline. Similarly to an ABS, notes (which include coupon and principal repayments) are issued to investors in tranches. The EETC typically provides a credit enhancement to that of the underlying issuer as a result of tranching the notes, use of a liquidity facility and cross-default provisions across the underlying collateral.	In September 2016, American Airlines issued an EETC raising $814m to finance 25 aircraft. Two tranches of notes were issued: a senior tranche rated Aa3/AA+, initial average life of 8.8 years and a 3% coupon and a junior tranche, rated A2/A+ initial average life of 8.8 years and a 3.25% coupon. [9]

What To Consider When Looking At Airline Debt?

Here are a few points to consider when, as investors we are looking at a company's debt.

Aviation debt is largely in US dollars; however, as emerging market demand for aviation increases over time, analysts expect to see a larger number of issues in other currencies. For example, in 2015 Turkish Airlines issued aviation debt in Japanese yen. As investors we should be aware of this trend, due to potential exposure to currency fluctuations within companies. Are they Hedged?

Aircraft finance is, however, currently considered to be a more stable form of debt when, for example, compared to other illiquid assets, like commercial real estate. This stability is because aircraft valuations tend to be driven by global rather than local demand. Related to this, aircraft can be easily redeployed to different geographic markets.This high degree of adaptability is critical as it encourages aircraft suppliers, banks, and leasing companies to provide financing for aircraft acquisition with the aircraft used as collateral.

Also, newer-production aircraft models tend not to fluctuate heavily in value, especially when compared perhaps to the owning companies share price! This makes it more attractive for individuals to gain exposure to the airline industry via debt issuance rather than equity, making debt cheaper to acquire. By way of illustration, following 9/11, a major global event in terms of the aviation industry, Tier 1 aircraft values typically declined 10%−20% compared to, for example, American Airlines and United Airlines, whose stocks fell by more than 40%.

Aircraft have finite economic lives (historically, approximately 25 years), which means that the value of the underlying collateral reduces over time. Despite this, deals are often designed so that collateral protection increases over time. This is where the debt amortizes faster than the underlying asset depreciates. However, deals that include a large payment toward the end of the loan are also common (particularly on shorter-term financings). Again, as investors this is important to understand when examining cash flows, as debt provisions could be loaded towards a future date. As always you need to read the footnotes of any annual report to understand debt structures.

Aviation is a well regulated industry. As a result, investor capital is often considered protected, making it easier for airlines etc to secure finance. For example, international agreements such as the Cape Town Convention protect investors in the event of default by ensuring swift recoveries. Following default on a debt, the Cape Town Convention permits the borrower a defined period (usually 60 days) to return the aircraft to the creditor.

In addition, operating, maintenance procedures and safety frameworks implemented by regulators help preserve the value of an aircraft. Aircraft have to be operated and maintained by authorized personnel through regulated bodies to a certain standard.

However, Institutional investors are often required to report the “fair value” of their assets in annual reports etc. This can be an issue with aviation debt, where there is no direct market price, due to the lack of industry transparency and available data. Instead, investors often price to a corresponding aircraft model. As private retail investors just be aware the value of a particular aircraft fleet may not be quite what it seems at first glance! It’s often based on an assumption.

What is an ECA?

An ECA is an Export Credit Agency. In basic terms, an ECA finances transactions where sovereign states or government bodies provide financial support to would-be purchasers of certain goods or equipment constructed in the ECA’s home jurisdiction.

ECA support can make deals both more bankable and more affordable, and has long been a useful feature of asset and project finance. Over the last two decades, a significant amount of export credit support in the form of both guarantees and insurance has been provided to many capital-intensive global projects, not just aviation.

EETCs

Aviation debt varies. But, despite its name, Enhanced Equipment Trust Certificates (EETCs) are about debt and tend to offer the longest cash-flow terms, for example, “A” tranche debt issuance might have a 12-year term and 9-year weighted average life across the industry. Generous collateral arrangements and regulatory protection has led to high historical recovery rates on debt issued making EETCs popular. For example, a study by Kroll Bond Rating Agency shows that recovery rates on EETCs from 1994 to 2014 were 99.8%, 96.1% and 92.7% for A, B and C tranches (a tranch relates to the priority of repayment).

Asset Back Securities (ABS)

With secured aviation debt, cash flows are secured on physical assets. Unlike property, these aviation assets tend to be ‘flexible’ and can be reapplied elsewhere easily. This means that sale is not restricted by the geography of the purchaser, as in the case of real estate, for example.

In an ABS, it is the leasing company’s responsibility to manage repossession and resale upon default of the underlying airline. In contrast, following default of an EETC or a private loan, it is the investor’s responsibility to resolve the default. This could include obtaining an aircraft valuation, renegotiating the debt structure or repossession and remarketing the aircraft.

Regional Outlook for 2020

Let’s look to the near future and see what 2020 might hold.

The regional profit picture is mixed for 2020. Africa, Middle East and Latin America have lost money in 2019, analysts expect carriers in Latin America returning to profit in 2020 as regional economies strengthen. Airlines in North America continue to lead on financial performance, accounting for 65% of industry profits in 2019 and this is expected to be around 56% of aggregate earnings in 2020.

Financial performance is expected to improve or remain the same compared to 2019 in all regions except for North America, where expected capacity growth owing to new aircraft deliveries could put pressure on earnings (more on my thoughts on the US later).

North American carriers are expected to post a net profit of USD$16.5 billion (down from $16.9 billion in 2019). That represents a 6.0% net margin and a net profit of USD$16.00 per passenger. The region managed to improve profitability in 2019, as the still strong economy and structural improvements in the industry allowed unit revenues to hold up much more than in other regions.

But in 2020, unit revenue and profitability are expected to reduce. This will be the result of a slowing economy and a significant increase in aircraft deliveries particularly with the anticipated return to service of the 737 MAX fleet towards the end of 2020 (at time of writing!).

European carriers are forecast to report a USD$7.9 billion net profit in 2020 (up from USD$6.2 billion forecast for 2019) as airlines in the region benefit from the opposite pattern of the developments expected in North America. Economic growth is forecast to pick up moderately and, as a result of substantial cuts in expansion plans, capacity growth is expected, helping to improve the supply-demand balance. The net profit per passenger is expected to be USD$6.40 (3.6% net margin).

As already discussed, this relatively good performance for the region hides a long list of airlines just breaking even or making losses, which is why there were a series of European airline failures in 2019.

Analysts expect Asia-Pacific carriers to be helped by any modest recovery in world trade and air cargo, showing a USD$6.0 billion net profit in 2020 (up from $4.9 billion in 2019) for a 2.2% net margin. Although please note these predictions were made pre flu virus outbreak.

Asia remains the manufacturing center of the world. Revenues from transporting many of those goods are a significant proportion of sales for many of the region's airlines. But analysts consider the trade war is just on hold longer term. Consequently, the rise in trade and cargo volumes is moderate. The net profit per passenger is anticipated to be USD$3.34.

Middle Eastern carriers are continuing a restructuring process and announced schedules point to a substantial slowdown in capacity growth for 2020. After very weak economic growth in 2019, which limited local traffic, analysts expect some rebound in 2020. Restructuring and stronger growth will boost performance. But this will take time and a loss is expected for a third consecutive year, estimated at USD$1 billion, trimmed from USD$1.5 billion in 2019.

Latin American carriers are expected to benefit from improvements to the underlying economies and restructurings and return to the black next year with a small profit of USD$100 million. Apart from currency weakness in 2019, the region's economy slowed sharply to just 0.2% due to problems in Mexico, recession in Argentina and a decline by around one-third in the size of the Venezuelan economy.

In 2020 airlines will be helped by the rebound to 1.8% growth forecast by the IMF, led by stronger growth in Brazil and Mexico and less severe contractions in Argentina and Venezuela. This represents a USD$500 million positive swing compared with an expected loss of USD$400 million in 2019.

African carriers continue to suffer structural problems of high costs, in large part owing to government taxes and fees. Economic growth in the region has been relatively good and is expected to rise in 2020, but markets are extremely fragmented and inefficiently served in the absence, so far, of a Single African Air Transport Market. As a result, they are projected to show a loss of USD$200 million, similar to 2019.

Some Thoughts on US Airlines

In recent times I have seen a number of commentators recommending US Airlines. From what we have seen, in the short term this might appear to be a good idea, some have plenty of cash and the last few years have been good, for some. But appearances can be deceptive and take a longer time frame I am not so sure.

At a macro level, the US airline industry has produced small profitable margins dating back to 2010. From 2010 to 2015, the U.S. airline industry produced growing margins, bottoming at four percent in 2011 and peaking at 15 percent in 2015. However, since peaking in 2015, the margin for the US airline industry has declined each year.

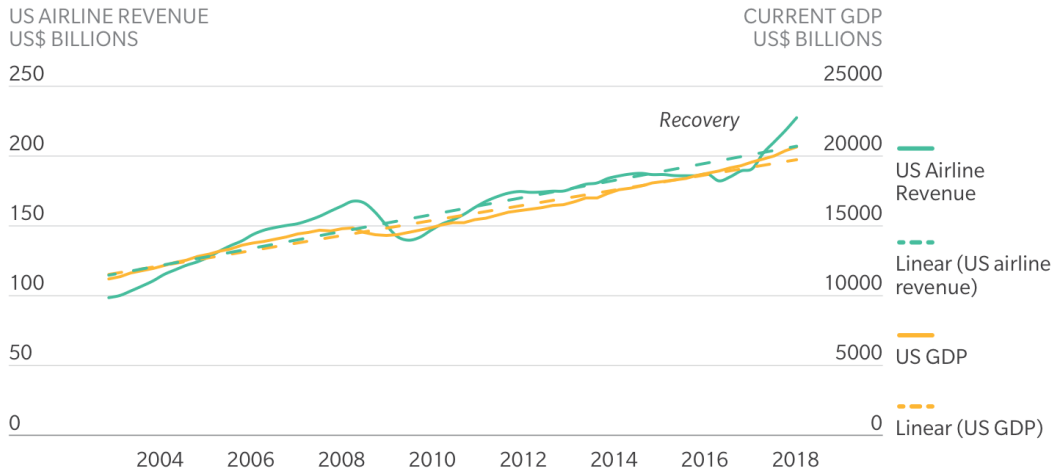
During the period of margin expansion, industry capacity growth generally remained at or below GDP growth. In 2015, as oil prices dropped, industry capacity began to grow faster than GDP. Subsequently, margin consistently declined as capacity growth continued to outpace GDP.

At an industry level, capacity growth aligned with GDP allows aircraft loads (passenger numbers) to increase and average fares to stabilize and increase. When capacity outstrips GDP it tends to drive down ticket prices and margins. So there is overcapacity in the US carrier fleet.

Also, during this period the price of oil, the industry's second-largest cost driver, dropped from the mid-USD$90 per barrel range to below USD$65. As of writing it is USD$51 (in most years it was at or below $50,). In other words, the US airline industry managed to erode its margins at a time of lower energy costs. A time when it should have been making larger profits.

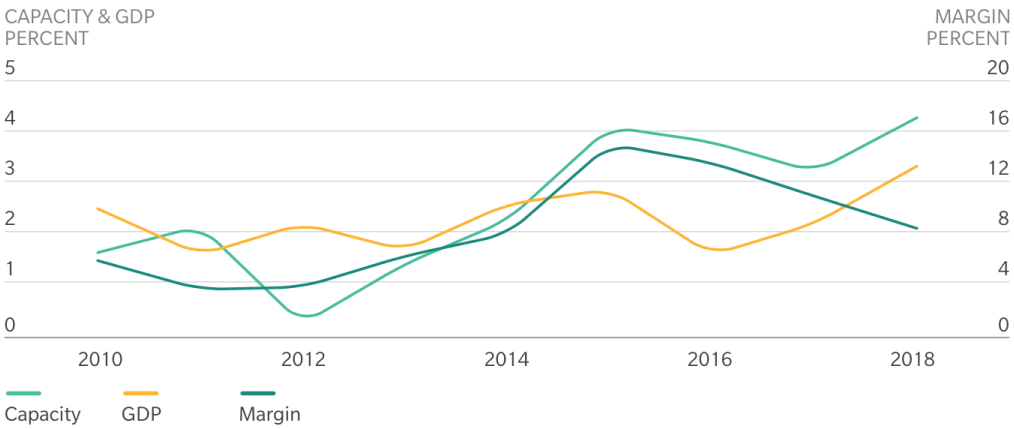
Prior to this period of low oil prices, the industry was actually producing its highest margins in decades, despite operating in an environment that had previously contributed to losses, (via relatively high energy cost and lower/ slowing GDP growth). So in recent years, the performance of US carriers, generally, has got worse.

EXHIBIT 3: **US AIRLINE REVENUE AND GDP, Q1 2003 THROUGH Q3 2018**



Source: Planestats.com > Form 41 Financials > P 1.2 Income Statement

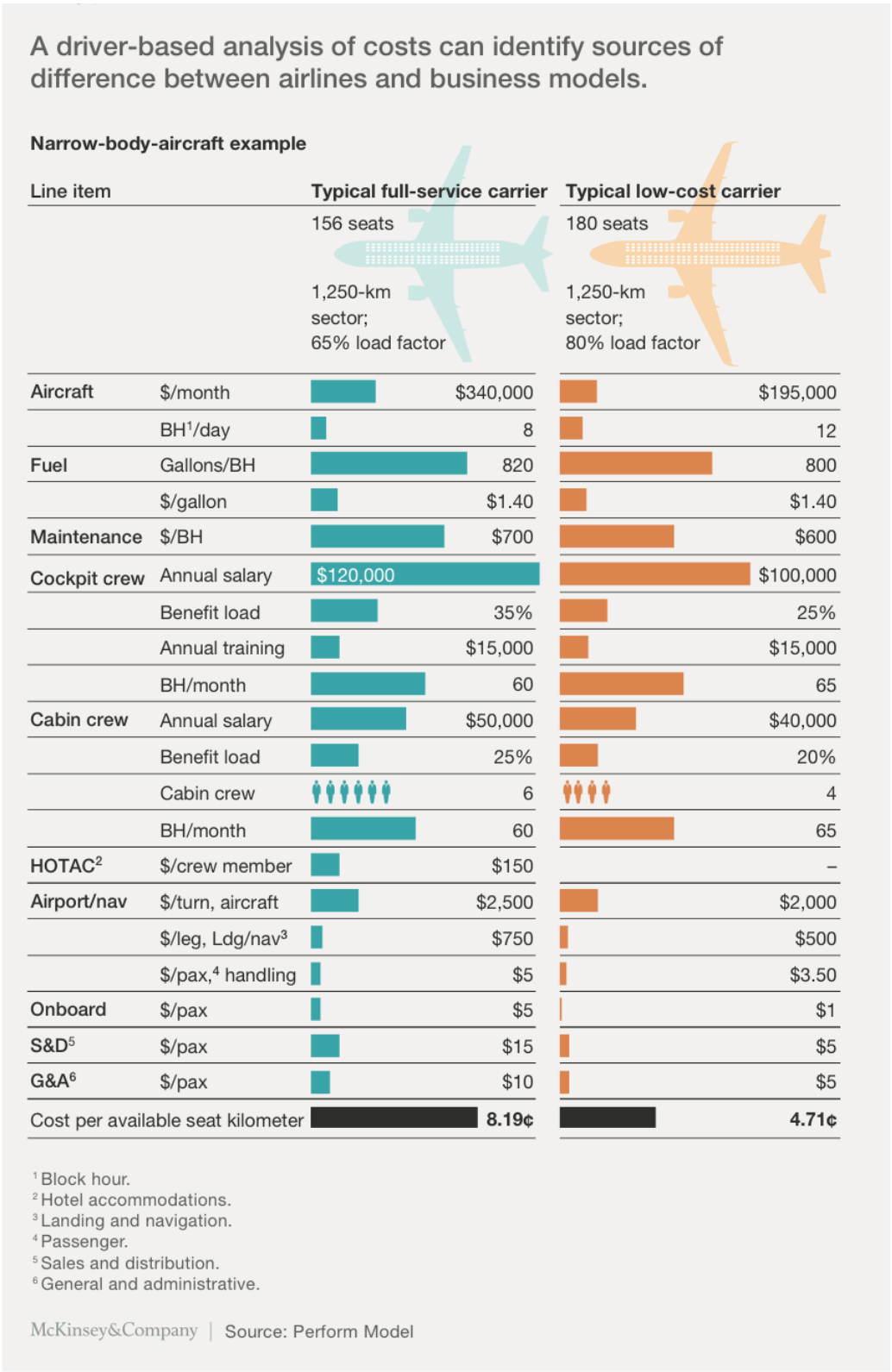
EXHIBIT 21: **US AIRLINE INDUSTRY MARGINS, GDP, AND AIRLINE CAPACITY, Q1 2010 THROUGH Q2 2018**



Source: Form 41 and Bureau of Economic Analysis accessed at bea.gov

To summarise my thoughts, despite what some analysts say about strong cash positions and de levered companies. Generally, most US Carriers have eroded their profit margins at a time when they should have been increasing due to low fuel prices. So, I'm not saying don't invest. I am saying, as a long term investor, just be careful.

Why are Low-cost Airlines Doing Better?



A driver-based analysis of costs can identify sources of difference between airlines and business models.

Narrow-body-aircraft example

Line item		Typical full-service carrier 156 seats 1,250-km sector; 65% load factor	Typical low-cost carrier 180 seats 1,250-km sector; 80% load factor
Aircraft	$/month	$340,000	$195,000
	BH[1]/day	8	12
Fuel	Gallons/BH	820	800
	$/gallon	$1.40	$1.40
Maintenance	$/BH	$700	$600
Cockpit crew	Annual salary	$120,000	$100,000
	Benefit load	35%	25%
	Annual training	$15,000	$15,000
	BH/month	60	65
Cabin crew	Annual salary	$50,000	$40,000
	Benefit load	25%	20%
	Cabin crew	6	4
	BH/month	60	65
HOTAC[2]	$/crew member	$150	–
Airport/nav	$/turn, aircraft	$2,500	$2,000
	$/leg, Ldg/nav[3]	$750	$500
	$/pax,[4] handling	$5	$3.50
Onboard	$/pax	$5	$1
S&D[5]	$/pax	$15	$5
G&A[6]	$/pax	$10	$5
Cost per available seat kilometer		8.19¢	4.71¢

[1] Block hour.
[2] Hotel accommodations.
[3] Landing and navigation.
[4] Passenger.
[5] Sales and distribution.
[6] General and administrative.

McKinsey&Company | Source: Perform Model

Generally, low-cost carriers (LCCs) are more profitable than larger more complex rivals. But on average they still do not cover their cost of capital. Why are they doing better, and why is that better performance still relatively disappointing?

There are a number of reasons:

Barriers to entry are low. Low interest rates and attractive aircraft finance have triggered a number of entrants into the low cost airlines sector, the examples of Southwest and Ryanair triggered many copycat entrants. However, this does not guarantee success. A number of low-cost airlines have failed, especially in the US. These failures have allowed the remaining low cost carriers to achieve more sustainable profits.

The flying 'point-to-point' business model of low cost airlines, reduces the room for price variations; network airlines price the same connection very differently if it is part of a bundle of connections. Low-cost airlines with their point-to-point system do not face this additional challenge.

Low-cost airlines face systematically weaker suppliers than the average network airline; some of these advantages are related to the business model of low-cost airlines. Low-cost airlines often choose secondary airports where they are in a good position to negotiate favorable conditions. Low-cost airlines run only a limited number of aircraft types, often just one, which increases their purchasing power versus aircraft producers. And low-cost airlines have been able to create non-unionized workforces with lower wage levels, often also by hiring staff in less-prosperous regions. For example, in the US this has been found to account for about 45% of the cost advantage between LCCs and network airlines.

Low-cost airlines have only one focus, while network airlines use different products for different customer groups, low-cost airlines have been able to organize themselves around providing one key thing, low prices.

Government policies have provided some benefits to LCCs, for example, via lower costs or subsidies for using regional airports in poorer areas. Whereas larger carriers have to use expensive hubs, for instance, Heathrow or New York. However, more recently regulators have become more active in reviewing airport fee subsidies and some of the pricing policies of LCCs, especially in Europe.

The shorter history of LCCs on average also plays a role, enabling cost advantages available to new entrants. Interestingly, analysts suggest LCCs make more money from ancillary services than from ticket sales alone.

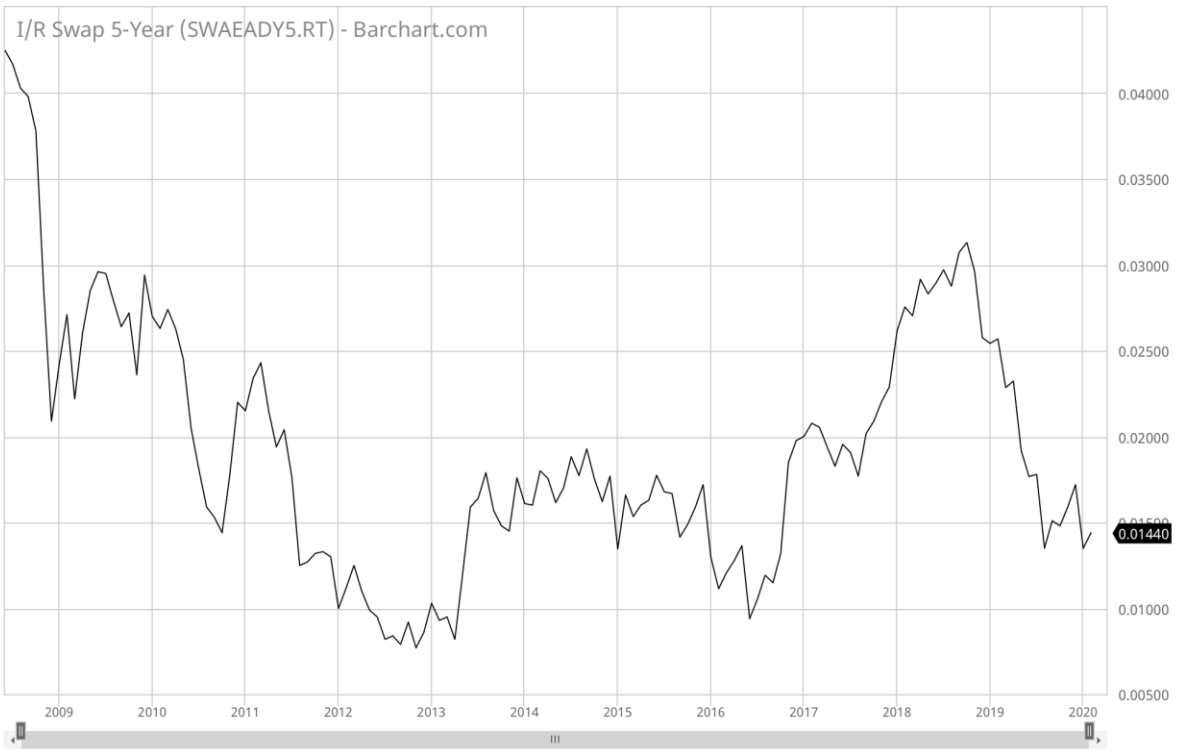
But do not think LCCs are always the best investment. While these advantages exist, the underlying cost economics are still the same for all airline companies. This puts pressure on margins. LCCs might have slightly better margins, but does that mean we should invest?

LCCs and the Future

The emergence of low-cost carriers was arguably the most significant market trend in the last 40 years, helping to drive down prices for passengers and provide greater choice. Analysts consider LCCs will continue to see intense competition going forward. This could include more low-cost, short-haul routes but also an extension of the low-cost model to longer routes. But airline margins are sensitive to rising costs, such as those associated with exchange rate fluctuations, interest rates or volatile oil prices. These effects are likely to be felt by low-cost carriers, in the future, who operate on lower margins Tay more traditional carriers.

LCCs and Interest Rate Vulnerability

In aircraft finance the 5 year interest swap rate is considered the most correlated with the value of aircraft. The 5 year swap rate is currently 1.41%. As can be seen from the chart below it is currently low when compared to its 20 year history.



Obviously any rise in rates Increases borrowing, financing costs and lease rates for aircraft. It also Increases the hurdle rates for doing new deals.

LCCs and Fuel Cost Effects

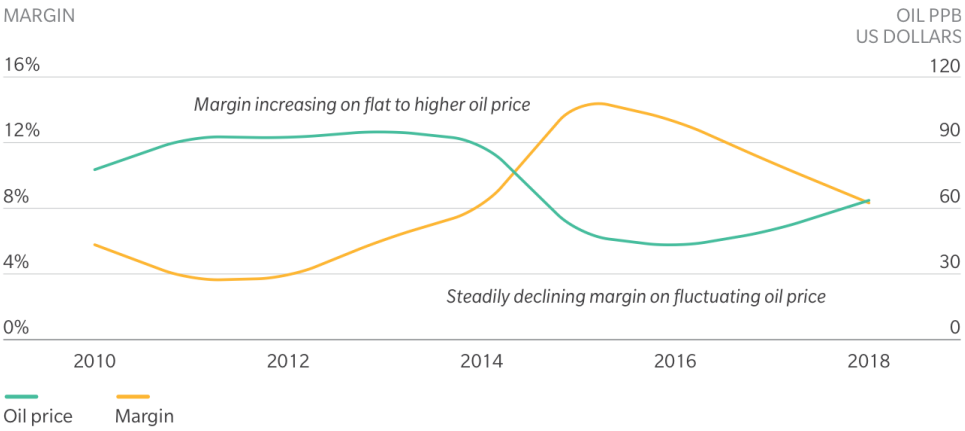
As can be seen from the chart below, LCCS are more vulnerable to fuel costs

- Ratio of fuel cost to sales has increased significantly

Fuel Cost/Sales for a basket of global airlines		
2018 Q3	2013 Q3 (5 year low)	2016 Q1 (5 year low)
25.3%	34.4%	18.8%
Fuel Cost/Sales for a basket of global full service airlines		
2018 Q3	2014 Q4 (5 year high)	2016 Q1 (5 year low)
24.1%	31.5%	18.4%
Fuel Cost/Sales for a basket of global low-cost carrier airlines		
2018 Q3	2014 Q1 (5 year high)	2016 Q3 (5 year low)
27.7%	39.8%	21.1%

Source: Bloomberg- BI Global Airlines Valuation Peers; BI Global Airlines Full Service Valuation Peers; BI Global Airlines Low Cost Carriers Valuation Peers

EXHIBIT 1: **US AIRLINE INDUSTRY MARGIN AND OIL PRICE PER BARREL, 2010 THROUGH Q2 2018**



Source: Form 41 and Energy Information Administration accessed at eia.gov

Airlines That Have Created Shareholder Value

Consistently low airline industry profits over the past 40 years aggregate a wide variety of performances. There have been a small number of airlines that have performed far better than the average. During the 2000s the average airline generated an EBIT margin of just 0.7%. Excluding small airlines, there were less than 15 that managed to produce an average EBIT margin in excess of 8%. These figures are 10 years old now, but analysts consider they have generally continued their trends.

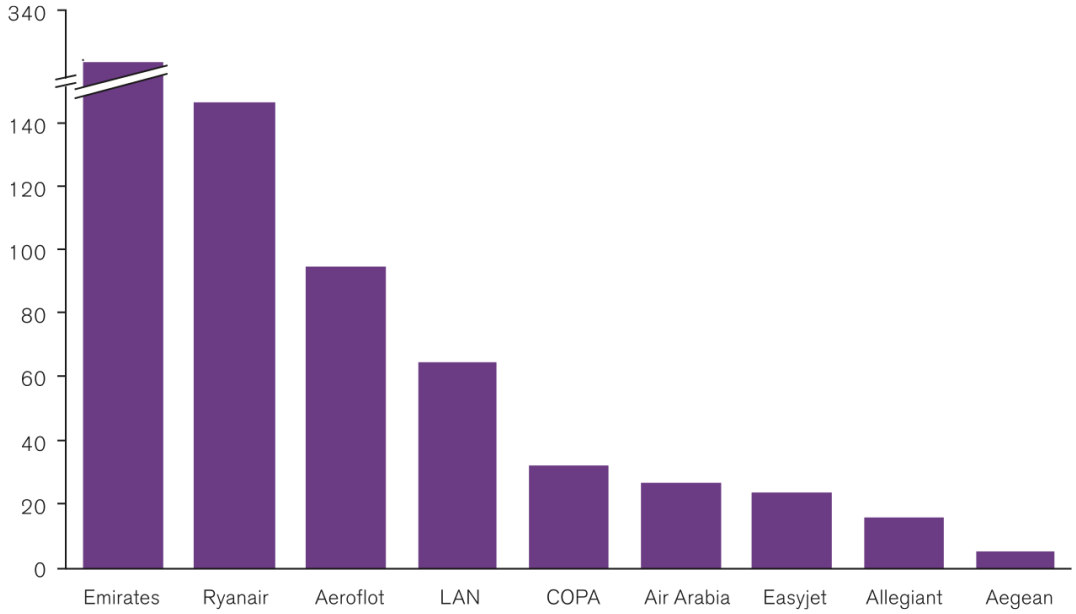


Chart 18: Airlines creating economic profits during the 2000s
Source: McKinsey & Company for IATA

These profitable airlines represented a number of different business models, small and large, and several profitable airlines can be found in most major regions of the world.

The Top Performers

Later we dig deeper into the financial statements of certain companies, looking at cash flows and possible price entry points and expected returns etc. For now, however, let's look at some that are considered to consistently produce higher returns and ask our why that might be the case.

Please note, this isn't meant to be a 'buy or sell' situation, some are not even public companies, we just want a quick look to understand why analysts rate them. We are also looking historically not to future performance.

In general, many of these airlines occupy geographical or market niches, or benefit from strategic assets that are hard to replicate. Others have established brands and reputations that would require substantial time and investment to challenge. In other words, they tend to have a moat in some form or other.

Emirates

Emirates does not have the highest margins in the industry, but, has generated the largest amount of profit during the past decade. This is largely due to a favourable corporate tax regime in the United Arab Emirates, but even had this not been the case, at a 30% corporate tax rate, Emirates would have created over USD$50 million of profit a year. Owned by the Dubai Governments Investment Corporation, it is not publicly listed.

Apart from tax, fuel prices are generally lower in the Middle East region. Fuel is a considerable percentage of costs for all airlines. The airline also benefits from having rich, generous owners, a rapidly expanding fleet of new aircraft has lowered unit costs and they have made substantial investment in airport facilities within Dubai.

In fact, this is perhaps it's greatest strength, Emirates has a strong position in a number of long-haul markets, transferring passengers through the airline's Dubai hub. Dubai is geographically located in a good position, with 4.5 billion people living within an eight-hour flight.

Ryanair

Ryanair has the highest margins and generates the second largest amount of profit in the industry. It is the lowest cost airline in the European markets and as any one who has ever travelled with them can attest, they have a strong focus on costs. They charge you extra for everything!

But that is not the whole story.

Following 9/11, Ryanair made a number of aircraft purchases from Boeing. Low purchase prices allowed Ryanair to sell other aircraft close to their book value before their costly 'D' services. This enabled Ryanair to keep its fleet younger, more fuel efficient with lower maintenance costs. The economic gains from this one off event is now coming to an end.

A focus on using secondary airports and often receiving favourable conditions from grateful regional governments, keen to promote tourism, means Ryanair has benefited from low airport costs and cheaper wages in poorer economic areas.

Less well understood is that Ryanair has positioned itself well in the market. Ryanair is focused on the bottom end of the demand curve, aiming itself at leisure and passengers visiting friends and relatives (VFR), these passengers are focused on price. This means Ryanair is able to

defend its position. Competitors offering higher fares than Ryanair find fewer customers, whilst, competitors trying to undercut fares find little benefit in increased demand as their price changes will be matched by the lowest cost airline.

Aeroflot

Aeroflot, is your traditional full service, international, network airline. It has, historically, generated the third largest profit in the industry. The reasons for this are less obvious. The airline appears to benefit from strategic assets (slots, route rights) and has an almost monopolistic position serving the large and fast-growing markets connecting the Russian Federation to international markets. In addition, the airline benefits from airspace access revenues. In other words, it is a legacy airline from the days of the USSR. If access revenues were ever removed, the airline moves down the profit rankings.

COPA

COPA is Panama's flag carrier airline. COPA's model is based on over 50% of its passengers connecting through its hub, Tocumen Airport in Panama City.

Tocumen Airport, gives COPA, 25-30 gates available for hubbing at peak times and is geographical situated to take advantage of South - North air traffic. In addition, in recent years, Panama City has become the regional headquarters for many multinational companies. COPA also has a number of route rights.

LATAM

A merger of LAN and TAM airlines formed LATAM Airlines Group. LATAM is Latin America's largest airline holding company and the second-largest carrier in Argentina, Colombia and Ecuador. The main hub is Comodoro Arturo Merino Benítez International Airport, Santiago, Chile. Secondary hubs in Bogotá, Lima, Buenos Aires and Quito airports.

LAN Airlines was the flag carrier of Chile until its privatization in the 1990s. LATAM Airlines Group was formed after the takeover by LAN of Brazilian TAM Airlines, in 2012. In August 2015, it was announced that the two airlines would fully rebrand as LATAM, with one livery to be applied on all aircraft by 2018.

Currently, LATAM Chile and LATAM Brazil continue to work as separate companies, under LATAM Airlines Group acting as the executive management.

Another full-service network airline, LATAM is another economic profit generator in South America. Its model is based on a cargo/premium passenger model. The airline has a strong brand for premium travel in the region.

In addition it has been able to overcome political restrictions and regulations to create a multi-hub network with operations based in several countries. This has helped to keep costs low by reducing the bargaining power of employees s well as improving the reach of its network for business passengers and cargo.

Allegiant Air

Allegiant Air is a relatively small LCC in the US, Headquartered in Nevada. Analysts consider it has consistently created shareholder value. Its model is based around connecting secondary cities with holiday resort destinations using an old, but fully depreciated, fleet of MD80s.

Southwest Airlines

Based out of Dallas Texas, Southwest Airlines is the world's largest LCC.
Some analysts consider its expansion by creating city links (referred to as city-pairs) has diluted Southwest's competitive advantage. They also consider it is suffering due to costs, its average pay, for example, has now become the highest in the industry.

A strong LCC in the 1980s and 1990s many argue it's best days might be behind it.

Singapore Airlines

Singapore Airlines is the flag carrier airline of Singapore with its hub at Singapore Changi Airport. It has been ranked as the world's best airline by Skytrax four times and topped Travel & Leisure's best airline rankings for more than 20 years.

Singapore Airlines has a number of subsidiaries. SIA Engineering Company handles maintenance, repair, and overhaul (MRO) business across nine countries. SIA currently has 27 joint ventures, including with Boeing and Rolls-Royce.

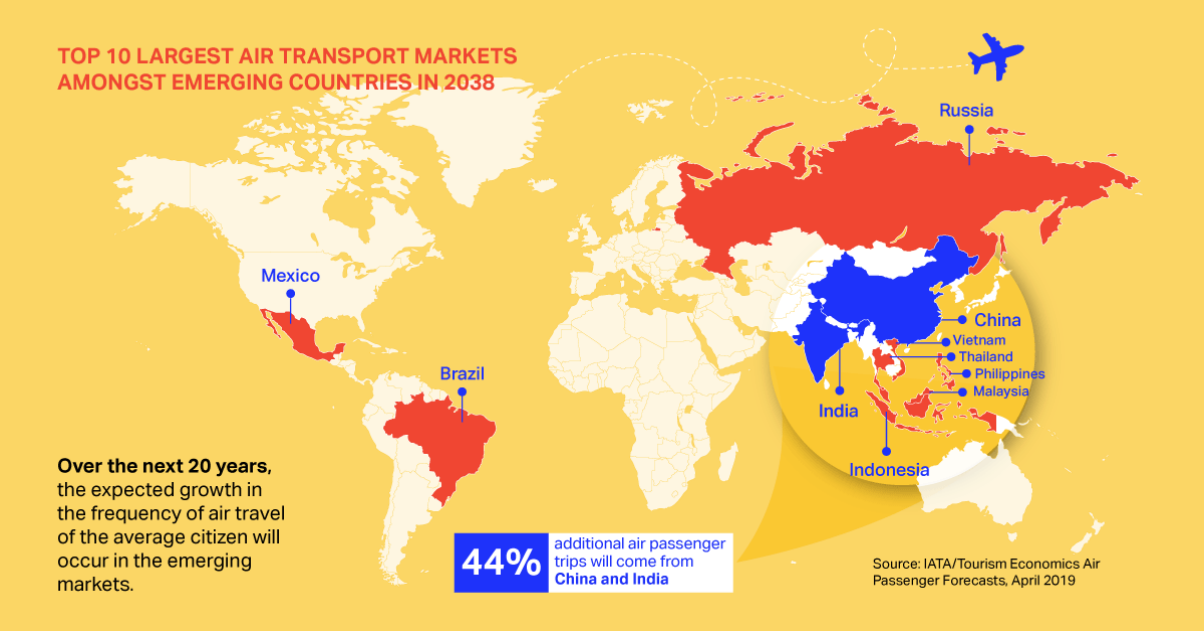
Singapore Airlines Cargo operates SIA's freighter fleet and manages the cargo-hold capacity in SIA's passenger aircraft.It has two subsidiaries, SilkAir operates regional flights to secondary cities, while Scoot operates as a low-cost carrier.

Whilst Singapore Airlines produces a higher EBIT margin than LAN it has not been great at generating economic profits historically. This lack of economic profit disguises a very successful network airline business. 40% of its passenger revenues come from premium ticket sales.

These were the consistently successful airlines for their shareholders in the past decade. Yet the median airline has not created financial value for their shareholders over the past 40 years. As previously discussed, shareholder value has been consistently destroyed.

Deregulation, especially in the US and other mature OECD markets, has led to a significant increase in competition. This competition has taken the form of frequent price changes and a huge variety of prices paid by passengers. So, when an airline stands out from the crowd, for whatever reason, it worth asking why.

A Look To The Future



Source: IATA

The IATA (International Air Transport Association) represents some 290 airlines comprising 82% of global air traffic. The International Air Transport Association (IATA) believes present trends in air transport suggest passenger numbers could double to 8.2 billion by 2037.

The latest update to IATA's 20-Year Air Passenger Forecast, shows that an increasing shift east in the industry is behind continued strong growth. Over the next two decades, the forecast anticipates a 3.5% compound annual growth rate (CAGR), leading to a doubling in passenger numbers from today's levels.

The Asia-Pacific region is considered to be the main driver of growth with more than half the total number of new passengers over the next 20 years coming from these markets. Asia-Pacific will see an extra 2.35 billion annual passengers by 2037, for a total market size of 3.9 billion passengers. Its CAGR of 4.8% is the highest, followed by Africa and the Middle East.

Growth in Asia-Pacific is being driven by a combination of relatively good economic growth, improvements in household incomes and favorable population and demographic profiles. The Asian market is forecast to be home to 40% of the global aircraft fleet by 2027.

China will displace the United States as the world's largest aviation market (defined as traffic to, from and within the country) by the mid-2020s. The rebalancing of China's economy towards consumption, via a growing middle class, is expected to support strong passenger demand over the long term.

India will take 3rd place after the US, surpassing the UK around 2024. Indonesia is forecast to be a standout performer—climbing to become he world's 4th largest market by 2030. Finally, Thailand is expected to enter the top 10 markets in 2030, replacing Italy which drops out of the ranking.

The North American region will grow by a CAGR of 2.4% annually and in 2037 will carry a total of 1.4 billion passengers, an additional 527 million passengers.

Europe will grow at a CAGR of 2.0%, and will see an additional 611 million passengers. The total market will be 1.9 billion passengers.

Latin American markets will grow by a CAGR of 3.6%, serving a total of 731 million passengers, an additional 371 million passengers annually compared to today.

The Middle East will grow strongly with a CAGR of 4.4% and will see an extra 290 million passengers on routes to, from and within the region by 2037. The total market size will be 501 million passengers.

Africa will grow by a CAGR of 4.6%. By 2037 it will see an extra 199 million passengers for a total market of 334 million passengers.

But…

In the past decade, commercial aircraft manufacturers have experienced record new orders. Despite new aircraft and system development costs having doubled in real terms, from hundreds of millions for major components to USD$5 billion for engines and USD$25 billion or more for aircraft (airframe engineering, design, manufacturing labour and tooling account for roughly 70 percent of total development costs).

These new orders have caused production backlogs equivalent to more than six years for narrow-body aircraft, one of the most popular and economic designs, an all-time-high. This demand, coupled with new market entrants have led original equipment manufacturers (OEMs) to increase production rates to a combined 1,700 narrow- bodies a year by 2025.

Fleet mix will change appreciably in the future . Analysts expect narrow-body aircraft will grow faster than the other classes. The regional jets and turboprop fleets will shrink in their share of the fleet, while wide-body aircraft will hold flat. By 2027, the shifts will result in a narrow-body share of 65 percent and wide-body share of 21 percent, while the smaller regional jet and turboprop fleets will slide 10 points to a combined 14 percent share. Even with new competitors, the Boeing 737 and Airbus A320 platforms are forecast to account for 90% of all narrow-body deliveries through 2027.

Historically, low-cost operators have had a strong preference for narrow-bodies. The majority of back orders are driven by operators adding to fleets and/or trying to improve margins by replacing regional jets and turboprops with a larger, more profitable aircraft. The significant influx of new aircraft will cut the narrow-body fleet age from 10.4 to 9.2 years and raise narrow-bodies' share from 56% to 65%.

REGION	AFRICA	MIDDLE EAST	ASIA PACIFIC	CHINA	INDIA	LATIN AMERICA	NORTH AMERICA	EASTERN EUROPE	WESTERN EUROPE	WORLD
2017 Fleet										
Narrow-body	447	516	1,981	2,316	346	1,066	3,917	716	3,027	14,332
Wide-body	167	709	1,304	328	52	157	1,188	117	978	5,000
Regional jet	143	74	213	111	5	292	1,855	180	492	3,365
Turboprop	294	23	648	0	46	263	714	131	552	2,671
Total	**1,051**	**1,322**	**4,146**	**2,755**	**449**	**1,778**	**7,674**	**1,144**	**5,049**	**25,368**
2027 Fleet										
Narrow-body	618	841	3,546	5,452	831	1,571	4,960	890	4,419	23,128
Wide-body	277	1,325	1,772	705	102	343	1,434	121	1,342	7,421
Regional Jet	45	28	237	315	60	200	1,444	74	364	2,767
Turboprop	164	69	730	23	73	182	457	47	447	2,192
Total	**1,104**	**2,263**	**6,285**	**6,495**	**1,066**	**2,296**	**8,295**	**1,132**	**6,572**	**35,508**
Fleet Growth Rates										
2017-2022	0.5%	6.6%	5.2%	10.6%	11.9%	2.8%	0.9%	-0.8%	3.2%	3.9%
2022-2027	0.5%	4.5%	3.4%	7.3%	6.2%	2.4%	0.7%	0.60%	2.2%	3.0%
2017-2027	**0.5%**	**5.5%**	**4.2%**	**9.0%**	**9.0%**	**2.6%**	**0.8%**	**-0.1%**	**2.7%**	**3.4%**
2017 MRO (US$ BN)										
Airframe	0.6	1.2	3.0	1.5	0.3	0.8	4.5	0.7	5.0	17.7
Engine	1.6	21.0	4.9	3.4	11.0	2.2	6.2	1.5	5.9	29.6
Component	0.5	1.1	2.9	1.2	0.3	0.8	4.7	0.7	3.3	15.5
Line	0.3	0.9	2.2	1.3	0 2	0.7	3.2	0.6	3.3	12.8
Total	**3.0**	**5.9**	**13.0**	**7.5**	**1.9**	**4.5**	**18.7**	**3.6**	**17.5**	**75.6**
2027 MRO (US$ BN)										
Airframe	0.5	1.7	3.8	3.0	0.5	1.0	4.5	0.7	4.7	20.4
Engine	1.7	4.9	8.4	10.0	1.8	4.2	7.7	1.8	7.5	47.9
Component	0.6	2.3	4.7	3.6	0.7	1.2	4.9	0.8	4.2	22.9
Line	0.4	1.4	3.2	3.1	0.5	1.0	3.6	0.6	4.1	18.1
Total	**3.1**	**10.3**	**20.0**	**19.7**	**3.5**	**7.3**	**20.7**	**38.0**	**20.6**	**109.2**
MRO Growth Rates										
2017-2022	0.0%	6.4%	4.0%	9.0%	7.9%	3.4%	-0.7%	-2.7%	-0.3%	2.4%
2022-2027	1.2%	5.0%	4.7%	11.3%	5.4%	6.8%	2.8%	4.1%	3.6%	5.2%
2017-2027	**0.6%**	**5.7%**	**4.4%**	**10.1%**	**6.7%**	**5.1%**	**1.0%**	**0.7%**	**1.6%**	**3.8%**

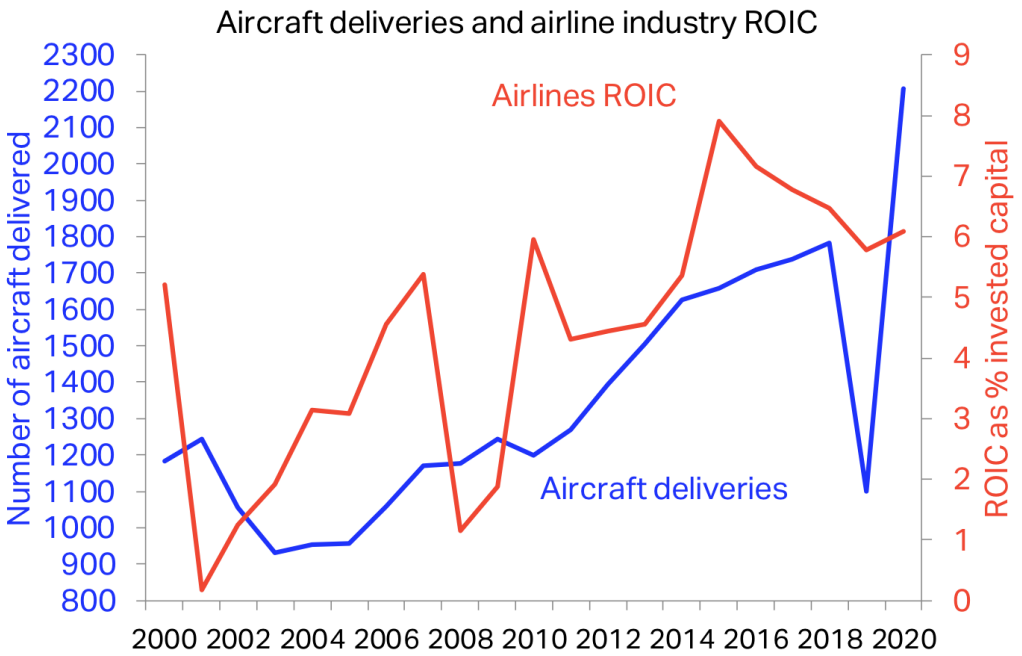
Source: Wymans

Airframe OEMs' current rate of production is between 57 to 60 aircraft a month and it has been suggested that this figure could move up to 68 to 70 a month. Engine OEMs for the new narrow bodies are reported to be producing seven engines a day, equal to more than 200 a month. These potential production rate increases, imply a 6.8% to 7% annual growth rate.

Industry analysts, agree. By making estimates on the use of these aircraft and the retirement of existing aircraft, analysts predict narrow-body capacity (measured in available seat miles) could grow 7 percent a year over the next decade. Whilst passenger demand (measured in

revenue passenger miles) is expected to grow at only around 4 to 5 percent a year (3.5% according to IATA). In other words, the airline industry is likely to suffer from over capacity in the near future.

Analysts, however, are broadly positive on the fundamental strength of the market. Many consider that airline profitability has improved to such an extent in recent years, that many airlines will be cushioned from some of the sharper shocks to operations, for example, via fuel cost increases and fluctuations in the value of the US dollar. They also believe a number of airlines have sensibly de levered, reducing their debts and gotten a great grip on costs.



That said, analysts also like to cover their backs, they warn that performance can turn very quickly, and there are a lot of signs of complacency within the Industry. This complacency is displayed by comments made by executives, over optimistic future production rates, and in cash deployment choices (buybacks). Analysts are also concerned over growth in China and SouthEast Asia. Many argue it has been excessive, too much, too soon leaving, certain carriers vulnerable to a turn in economics.

All analysts seem to agree though, a dampening global GDP forecast, volatile oil prices, any potential for rising interest rates, along with the continued increase in capacity indicate some airlines may have issues going forward. For example, weaker airlines in Europe have found the operating environment far more difficult in recent years, with six bankruptcies in 2018: Primera Air, VLM, Small Planet Airlines' German and Polish units, Azur Airlines, SkyWork and Cobalt.

Airlines are particularly impacted by rising interest rates in terms of debt finance contracts as well as escalation on any aircraft orders they have made, especially LCCs. A 50 basis point increase in interest rates could have a significant impact on borrowing costs for airlines with floating rate debt, which has been the norm in the low interest rate environment of the past decade.

Here, I will give two quotes. Firstly from an analyst from the credit rating agency Fitch talking to KPMG. Because finance and paying your debts is crucial for all businesses. And secondly from the CEO of aircraft leasing company, BOC Aviation, because they deal daily with airline companies.

Fitch

"We still see a lot of capacity coming in to the market, with production rates going up…..From a rating agency perspective, one of the biggest suppliers to the aviation sector is the credit markets, and our firm's view is that we're late in the credit cycle, with the overall market starting to turn, and I think we're seeing some indication of that, in the aviation credit markets as well."

BOC Aviation

"While we believe the industry, as a whole, will be very profitable over the next year, there are going to be those airlines that are making a lot of profit – generally either in domestic US or with pricing power and international routes – and those that will suffer that generally sit in emerging markets with depreciating currencies against the US dollar and are particularly being hit by fuel costs."