

TICKET TO THE FUTURE:

HOW INVESTORS IN AIRCRAFT CAN ANTICIPATE THE POST- PANDEMIC ECONOMY

KGAL GmbH & Co. KG
Tölzer Straße 15
82031 Grünwald / Munich
Germany

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AVIATION: TICKET TO THE FUTURE

HOW INVESTORS IN AIRCRAFT CAN ANTICIPATE A POST-PANDEMIC ECONOMY

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EXECUTIVE SUMMARY

- This paper assumes the pandemic is not permanent. Flying, travel and new destinations will no longer be sources of fear within any reasonable medium term time horizon.
- Growth in air travel is correlated with economic growth. Historically, between 2010 and 2019, countries with any economic growth per person have tended to see air passengers grow even faster.
- The world is set to regain 2019 records for global passenger numbers by 2023/24 – firmly within a medium term timeframe – while domestic and short-haul business is already recovering faster.
- Three global regions will drive a particular resurgence in domestic and short-haul international air travel – in particular the European Schengen-Area, domestic Chinese routes, and the United States.
- Excluding long-haul, aircraft are set to carry nearly three quarters of a billion passengers to airports in the United States by 2025.
- Airlines wishing to reach this future world require two key things: access to liquidity and access to fungible aircraft types. This is where financial experts with technical expertise play a major role.
- Today, demand for aircraft finance is extremely strong, so there is much more opportunity to incorporate many of the security and collateral points that fell away for most market participants over the years. This puts anyone supplying aircraft finance at a potential advantage.
- Previously, around half of aircraft globally (by value) were leased, as opposed to owned by airlines themselves. There may be a tendency for that leasing ratio to increase as airlines rethink their funding.
- It is possible to buy into an asset with considerable future value, such as a 737-800 or an A320neo, at a very low current market rate today. This creates opportunities for fundamental, value investors in real assets.
- Owning aircraft in 2020 is a responsibility, as owners and airlines contend on paying for insurance, maintenance and debt servicing. However, within a medium-term horizon, owning aircraft will gradually shift once more from solely responsibility into a right to lucrative returns on investment.
- Due to the unprecedented situation, investors can buy a ticket to future returns – and at a discount.

PART 1: AVIATION IN 2025: THE LONGER-TERM OPPORTUNITY

Fear in the rear-view mirror

“Investors face the fundamental question; do they believe the aviation market will exist in five years’ time?” –

Stephan Gundermann, Head of Portfolio Management, KGAL

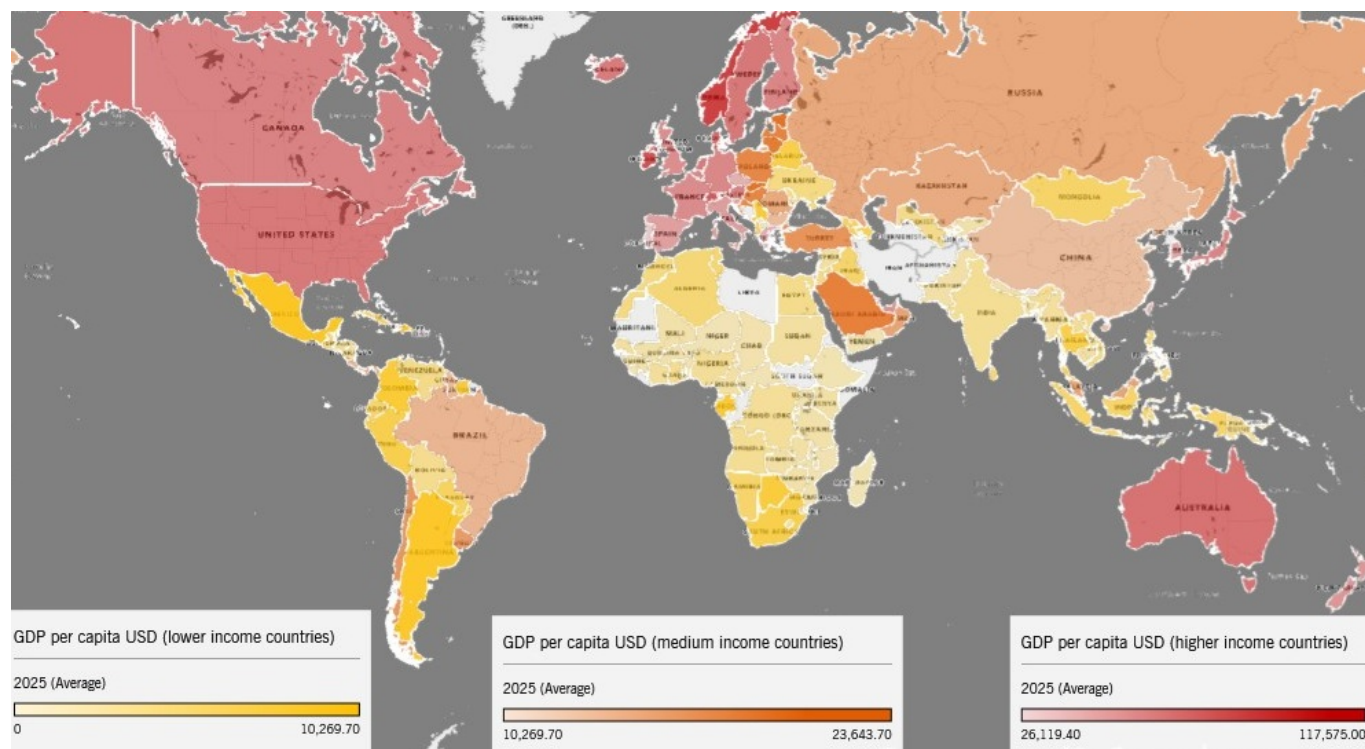
It is reasonable to assume that the world will not be in lockdown over the summer of 2025 because of a coronavirus strain that first emerged in 2019. This paper assumes the pandemic is not permanent. Flying, travel and new destinations will no longer be sources of fear.

This is why we at KGAL believe the picture of commercial aviation mid-decade is predictable enough to at least consider the implications of a base case scenario. Given this, understanding the likely market in five years’ time is a logical starting point for investors with even a medium-term horizon.

Considering common timeframes for investors, we believe it is important to fully understand the implications of a likely “base case” scenario for this very near-future world, in 2025. In order to do so, we have considered a wide range of published cases. Our judgement is that a reasonable level of consensus is now possible, for the first time since the start of 2020 – especially when looking beyond the remaining short-term volatility, to the arguably more important medium-term picture.

In painting this picture, we use forecasts and projections using econometric models from Oxford Economics, industry bodies such as IATA and our own expert judgement within KGAL and our partner organisation GOAL.

Global GDP per capita, 2025 (real USD)¹



¹ Primary data source: IATA, forecast: Oxford Economics, alongside KGAL calculations & illustrations

Turning to the world in 2025, we can look beyond the exceptional drivers of today's world. Without health risks, longer-term trends will resume their role as determining factors. In particular, travel is also associated strongly with disposable income. Initially in the coming years, this could become a more considerable "bottleneck". However, by 2025, global growth will again be an engine of passenger growth.

South Asia is expected to see GDP per capita (in real US dollar terms) 26% higher in 2026 than before the pandemic, in 2019. Other areas of emerging prosperity include "emerging" Eastern Europe, with GDP per capita expected to be 13% higher than in 2019 by the middle of the decade.

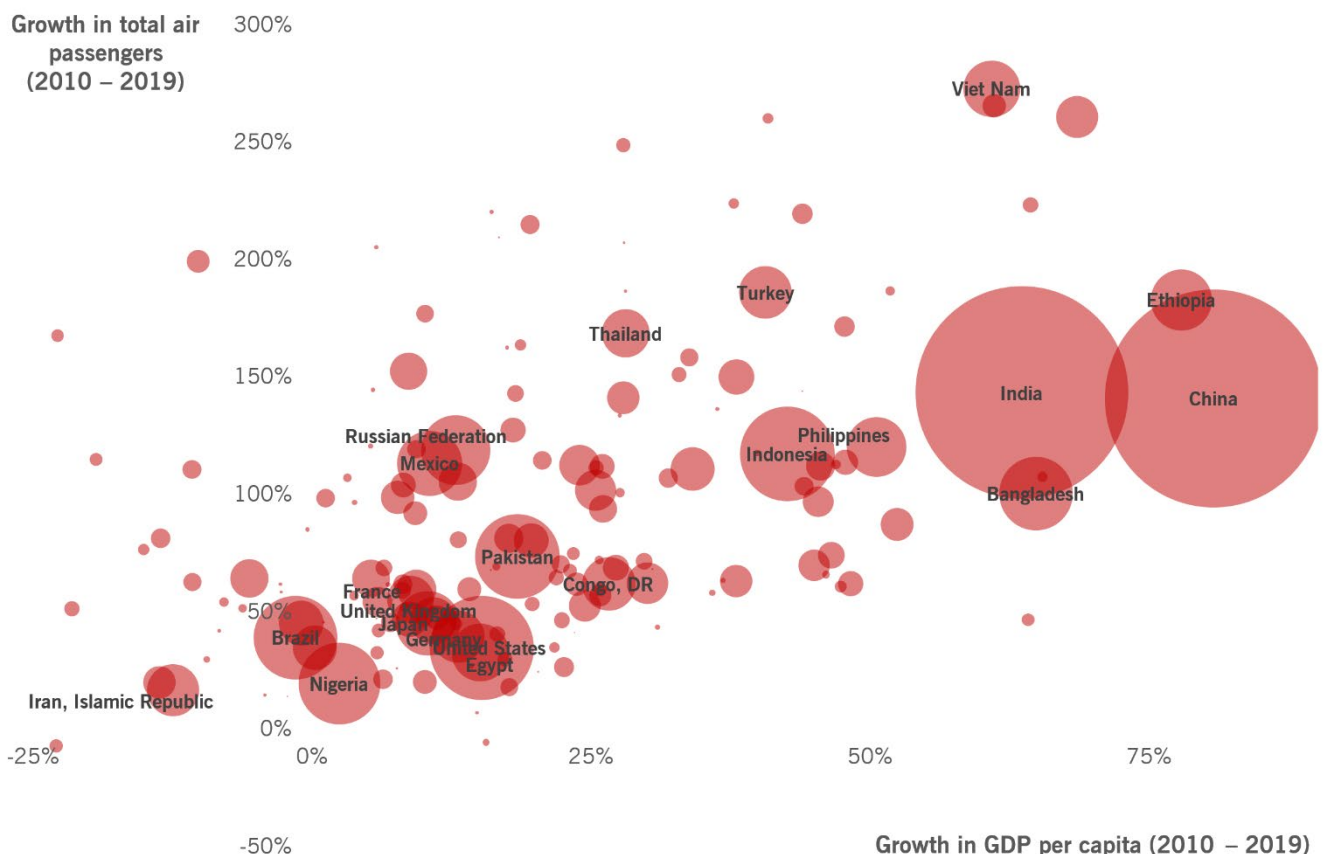
All of these expected cumulative growth figures include an ongoing severe recession in 2020. India, for example, is expected to see a severe 7% per-capita-recession in 2020, but nevertheless see GDP per head far higher in 2025 than in 2019, by 27%.

Aviation and growth

"Aviation is systematically relevant." – Frank Segger, Portfolio Manager, KGAL

Growth in air travel is correlated with economic growth per person. Historically, between 2010 and 2019, countries with growing economies saw air travel grow even more strongly.

Economic take-off: historic growth in air travel and GDP per capita² (size scaled by 2019 population)



² Historic data sources: IATA, Oxford Economics, alongside KGAL calculations & illustrations

Over that period, even a country with zero growth in GDP per head saw an average 64% cumulative growth in air passengers, as connections grew with other parts of the world. In addition to that baseline, any economic growth per person has tended to appear alongside additional growth in air passengers at a ratio of around 1.3% extra growth in passenger numbers for every 1% growth in GDP per capita³. Moreover, this relationship is particularly clear for larger, more populous countries.

While the correlation is reasonably clear, the causation behind this runs in both directions.

Aviation is not just a facilitator of tourism. As a support to economic growth, aviation can be thought of as a critical piece of regional economic infrastructure. Supplying efficient transportation between business, technology and creative centres helps to power innovation and growth. Connecting families and friends supports cultural awareness, remittances, and the mobility of skills.

Aviation also feeds directly in to the broader economy as an employer. It is estimated that commercial aviation supports as many as 65.5 million jobs¹, directly in airlines, airports, and maintenance but also indirectly through suppliers, manufacturers and tourism sectors around the world.

Governments understand this too. Jobs are increasingly a priority, while the associated tax revenue adds another strong incentive for governments to facilitate the recovery underway. Airlines and their customers generated a recent average of \$111 billion per year in tax revenues¹¹.

Looking once again to the next five years, this two-way support between economic growth and aviation growth looks set to both enable – and benefit from – key regions of emerging prosperity.

With the revival of longer-term factors, the world will once again begin creating new, globally “middle class” hubs. Eastern and Southern Europe, South and Central America, parts of Africa and the Middle East; all join China and South East Asia as considerable growth markets for aviation.

Select countries: the “new middle” of middle class households, 2025⁴
(with projected ratio within 20% – 80%)



³ KGAL calculations of correlations using historic data for 182 countries, excluding recent areas of armed conflict

⁴ Forecast: Oxford Economics, alongside KGAL calculations & illustrations

Global travel reimagined

“Human beings will be in contact with one another again.” – Frank Segger, Portfolio Manager, KGAL

By the middle of this decade, the global aviation industry will be larger, more global than ever before and anticipating future growth. In 2025, global passenger numbers are likely to strongly exceed four billion.

Despite the uncertainty, some elements of the world in the middle of this decade are reasonably predictable within a level of confidence. Our base case scenario, as described above, allows us to build a reasonably clear view of this future world.

On this basis, the world is set once again to exceed four billion passengers per year by 2023, setting what would be a new record and going beyond that set in 2019.

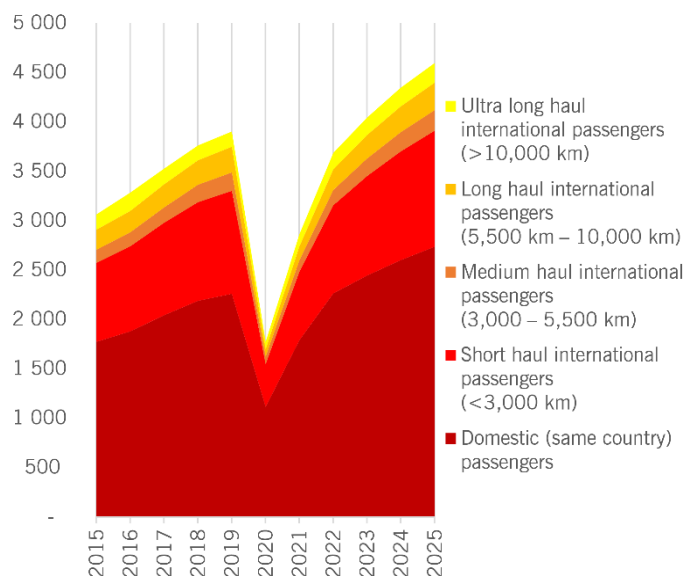
While not uniform by region, country, or type of flight (see next section), we expect a widespread global recovery to take place.

Passengers and their reasons to fly will change substantially too.

Quality of life, as one of the key drivers of consumer behaviour this decade, supports the idea that people will continue to travel when technology is not a good substitute. Memories are harder to make via video calls, of any quality.

Business travel has similar effects. In person meetings are generally more successful. A shift to remote working has unlocked efficiencies, but distance working has also highlighted some advantages of occasionally being in the same room.

Millions of air passengers globally by year and flight duration⁵ (2015 – 2025, expected)



A good way to describe these trends is the idea of *“selective travel”* – where, for both social and business purposes, people choose to travel for particular types of meetings, occasions and to see certain friends and family. “Visiting Friends and Relatives” (“VFR” tourism) is a large part of this, but the concept also applies to travel purely for personal relaxation and adventure too.

It was already a misconception that air travel always involves crossing international borders.

Domestic travel, within a single country has represented just under half of global passengers for some time.

Domestic travel has also been most resilient to the pandemic. In 2020 around 1.1 billion passengers will have flown within a single country’s borders, jumping to 63% of global passenger flight.

By 2025 the world is set to see 2.7 billion passengers on domestic flights alone.

As soon as 2021, we foresee domestic air travel at comparable levels to 2015.

Domestic passenger numbers appear ready to regain 2019 highs in 2022.

Because these domestic, same country flights have seen a far less substantial drop in 2020, the recovery rate will be considerable but not as high in percentage terms. Longer duration flights are restarting from an extremely low base.

⁵ Primary data source: IATA, forecast: Oxford Economics, alongside KGAL calculations & illustrations

For a clearer view, we look to the “net” growth in passengers between 2019 and 2025.

Net growth in domestic passenger numbers between 2019 and 2025 is expected to be 21%, after a 51% drop in 2020 compared to 2019, then followed by five-year passenger growth set to hit 145%.

For short-haul international flights, the one-year drop has been more severe, likely down 58% in 2020, but expected to see 170% growth over the next five years.

Without reason to believe cross-border travel in 2025 will be impeded by global events, we also foresee longer-haul international passenger numbers pick up considerably within this longer timeframe. Ultra long-haul routes in fact represent the second fastest growing duration category on this net basis, partly driven by new aircraft technology and the increasing popularity of “point to point” travel between any parts of the globe. However, long- and ultra long-haul travel will remain a substantially smaller market in absolute terms of passengers.

Net passenger growth prospects by route distance, globally⁶

Route distance	Decline 2020 vs. 2019	Growth 2025 vs. 2020	Net growth 2025 vs. 2019
Domestic (same country) passengers	-51%	145%	21%
Short haul international passengers (<3,000 km)	-58%	170%	12%
Medium haul international passengers (3,000 – 5,500 km)	-61%	187%	13%
Long haul international passengers (5,500 km – 10,000 km)	-71%	262%	7%
Ultra long haul international passengers (>10,000 km)	-53%	171%	28%
All flight durations	-55%	159%	18%

Geographically, these trends will be powered by particular markets – as point-to-point long haul expands globally alongside regional hotspots of international short-haul and domestic connection.

Millions of air passengers by year and flight duration⁷ (2015 – 2025, expected)

Route distance	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Domestic (same country) passengers	1,771	1,878	2,041	2,187	2,257	1,115	1,789	2,265	2,444	2,599	2,737
Short haul international passengers (<3,000 km)	803	864	937	1,003	1,045	434	694	893	1,009	1,102	1,174
Medium haul international passengers (3,000 – 5,500 km)	132	140	157	172	183	72	116	154	175	192	207
Long haul international passengers (5,500 km – 10,000 km)	203	215	233	249	263	77	139	207	237	261	280
Ultra long haul international passengers (>10,000 km)	155	185	159	149	154	73	127	166	181	191	198
Total by year	3,065	3,282	3,526	3,760	3,902	1,772	2,865	3,685	4,046	4,346	4,596

⁶ Primary data source: IATA, forecast: Oxford Economics (consistent with KGAL basecase scenario)

⁷ Primary data source: IATA, forecast: Oxford Economics (consistent with KGAL basecase scenario)

Proportion of air passengers by year and duration⁸
(2015 – 2025, expected)

Route distance	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Domestic (same country) passengers	58%	57%	58%	58%	58%	63%	62%	61%	60%	60%	60%
Short haul international passengers (<3,000 km)	26%	26%	27%	27%	27%	25%	24%	24%	25%	25%	26%
Medium haul international passengers (3,000 – 5,500 km)	4%	4%	4%	5%	5%	4%	4%	4%	4%	4%	5%
Long haul international passengers (5,500 km – 10,000 km)	7%	7%	7%	7%	7%	4%	5%	6%	6%	6%	6%
Ultra long haul international passengers (>10,000 km)	5%	6%	4%	4%	4%	4%	4%	5%	4%	4%	4%
Total by year	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Short-haul hotspots

“To fly or not to fly? It’s a question of to be curious or not to be curious... and the answer is yes, people will resume exploring the world by flying.” – Stephan Gundermann, Head of Portfolio Management, KGAL

By 2025, three parts of the world will have seen a renewed interconnectedness encapsulating both short-haul routes across borders (mapped in bright red below) and within individual countries (mapped in dark red).

Such hotspots include regions with close connections either domestically within a single country, or an international short-haul travel area that is effectively domestic. Key regions include the European Schengen-Area, domestic Chinese routes, and the United States.

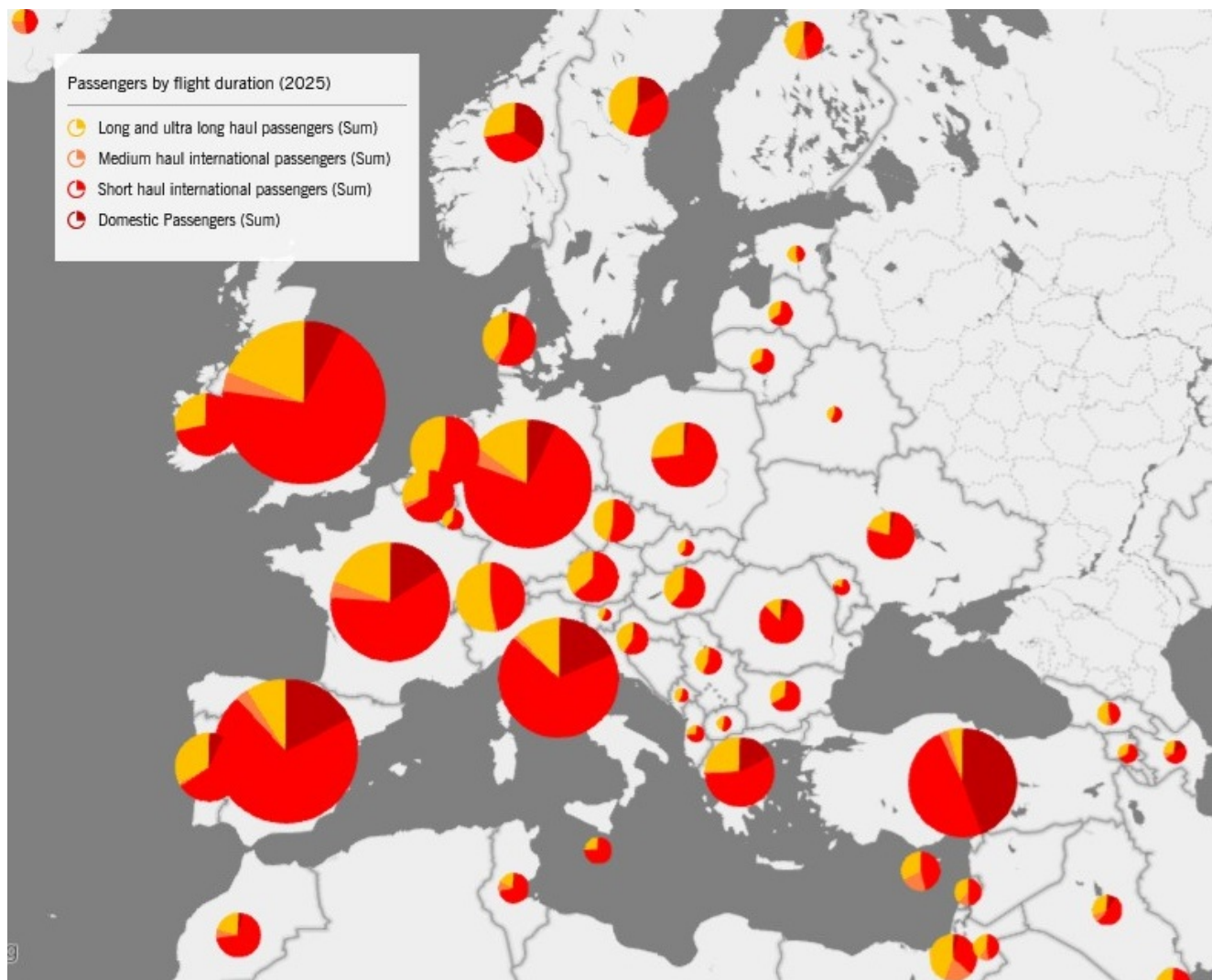
⁸ Primary data source: IATA, forecast: Oxford Economics (consistent with KGAL basecase scenario)

Europe:

Europe will be characterised by huge numbers of short-haul routes between countries, as tourist destinations but also as business hubs – and also with a substantial VFR market.

Around 1.3 billion total passengers will fly to European airports per year by the middle of the decade.

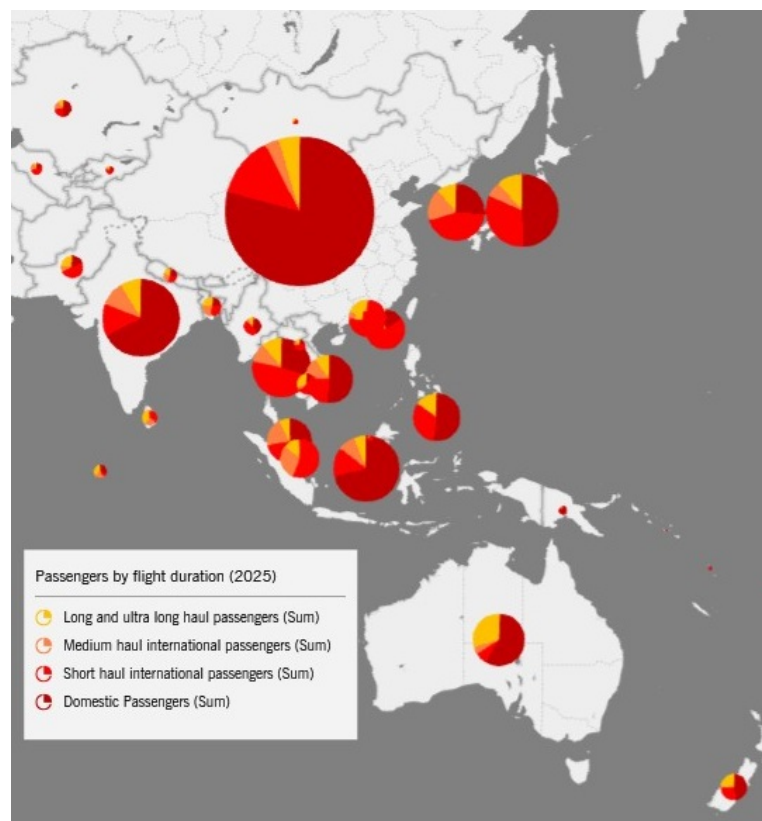
Passengers by destination and flight duration, 2025: Europe⁹



⁹ Primary data source: IATA, forecast: Oxford Economics, KGAL calculations & illustrations

Asia and Oceania:

Passengers by destination and flight duration, 2025: Asia and Oceania¹⁰



On this basis, however, Northeast Asia will see almost the same number of passengers and easily overtake Europe in the latter years of the 2020s.

However, Northeast Asia (even dominated by China) will not see the fastest growth in air passengers.

Southeast Asia includes many younger, growth markets for aviation – and will lead the world with net growth in passenger numbers of 39% between 2019 and 2025 – even including a 51% setback in 2020.

In addition to other substantial sources of Asian growth, China alone will see around 935 million air passengers by 2025.

An enormous 79% of Chinese air passengers are expected to travel on domestic routes – easily the largest single domestic market in the world by 2025, at 740 million passengers.

This would put China considerably ahead of the United States which itself is set for 635 million domestic passengers.

North America:

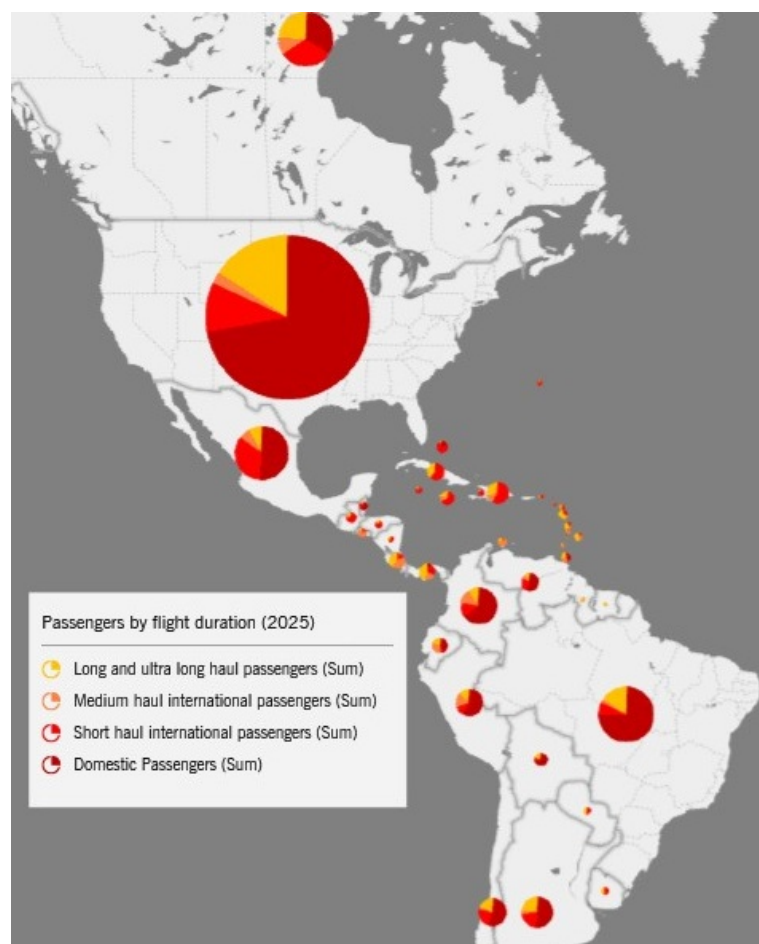
Comparisons between North America and Asian regions are so different partly due to the aviation dominance of the United States with only either small population countries (e.g. Canada) or low-to-middle-income countries (Mexico and the Caribbean) on the periphery. This is by contrast to the enormous domestic market of China surrounded by highly industrialised countries such as Japan plus entire high-growth regions.

Yet the United States itself will remain an enormous market for commercial aviation.

American GDP per capita could be pushing towards \$60,000 per person across the largest rich population on the planet. Domestic US passenger flights will be second in the world after China, but will nevertheless have grown substantially. The USA will remain the number one long-haul destination by a factor of three to China, with around 139 million passengers flying more than 5,500 kilometres to reach America.

¹⁰ Primary data source: IATA, forecast: Oxford Economics, KGAL calculations & illustrations

Passengers by destination and flight duration, 2025: Americas¹¹



Domestic plus short and medium-haul flights are set to carry nearly three quarters of a billion passengers to airports in the United States by 2025.

This will make America an even more essential global market for the future of narrow-body aircraft.

Millions of passengers per year¹²

Global Region	2019	2020	2025
Europe	1,184	479	1,311
Northeast Asia	1,010	487	1,288
North America	958	343	978
Southeast Asia	449	220	626
Africa & Middle East	332	147	379
South Asia	237	121	304
South America	215	102	238
Oceania	119	56	137
Central America	116	50	123

Changes in annual passengers¹³

Global Region	Decline 2020 vs. 2019	Growth 2025 vs. 2020	Net growth 2025 vs. 2019
Southeast Asia	-51%	184%	39%
South Asia	-49%	152%	29%
Northeast Asia	-52%	165%	27%
Oceania	-53%	146%	16%
Africa & Middle East	-56%	157%	14%
Europe	-60%	174%	11%
South America	-52%	133%	11%
Central America	-57%	147%	6%
North America	-64%	185%	2%

¹¹ Primary data source: IATA, forecast: Oxford Economics, KGAL calculations & illustrations

¹² Primary data source: IATA, forecast: Oxford Economics (consistent with KGAL basecase scenario)

¹³ Primary data source: IATA, forecast: Oxford Economics (consistent with KGAL basecase scenario)

Aircraft for sustainable growth

“Aircraft are not a take-and-hold commodity, but a stream of future cash-flows that are long-lived and highly individual.” – Kathrin Düker, Head of Asset Management, KGAL Aviation

Objectives for commercial aircraft: 2025

- Fly **almost four billion domestic and short-haul passengers** per year by 2025. New to young narrow body aircraft will be sufficiently flexible and efficient

Ideally matched:

- A320 family
- B737-800 series

- Fly **six hundred million passengers per year on routes beyond 5,500 km** by 2025. New-generation wide-body and extended-range narrow body aircraft will be best placed

Ideally matched:

- B787
- A350
- A321 with extended range

The events of 2020 have been a crisis for aviation, but potentially a bonus for the environment. Many people would agree with this, but many would also mistakenly believe it was only due to flight cancellations.

Much more significantly, every time an older aircraft is retired and replaced with a newer model, of the latest generation such as an A320 neo, associated ongoing carbon emissions are reduced by a factor of around 25%.

With the latest generation of aircraft, average fuel consumption has fallen to around 3.4 litres per 100 passenger kilometres. This is the equivalent of 83 miles per gallon per passenger and so roughly in line with the environmental damage of travelling the same distance driving alone in a hybrid fossil fuel-electric car.

No kerosene jet engine will ever run without fuel, so this will

not be enough by the time governments plan to stop all carbon emissions (likely at least full aircraft lifetime away of 20 – 30 years). However, the events of 2020 will provide a kick-start to the eventual process of gradual decarbonisation in aviation.

Later this decade the aviation industry may face a new regime, where growth continues but increasingly incorporates the broader environmental costs of flying. Future fuels may include hydrogen, such as the concepts recently proposed by Airbus^{III}, or possibly ammonia due to its higher density. Such technologies are already under development^{IV} and would not necessarily require entirely new airframes. Synthetically-produced kerosene may be an even more practical solution. Chemically near-identical, it could require zero change to existing airframes and engines.

At KGAL, we have considered the likely development of a new generation of aircraft which may add even more advanced ways of maximising efficiency of traditional engines. We have also looked at the potential for entirely new fuels and engine technologies – and conclude the development of even the first, more incrementally lower-carbon aircraft of substantial range will not begin in earnest for at least a decade.

Developing new aircraft is always a cost intensive and time-consuming process. Cutting edge designs in production at the start of the 2020s were first conceived in the early 2010s – and efficiency was given particular importance at this stage due only to the much higher oil prices of the time.

The next generation of commercial aircraft will also be especially cost intensive, but delayed even further due to the events of 2020. Initial development of next-generation commercial aircraft may begin in the second half of the 2020s, with production starting only gearing up in the 2030s.

For these reasons, we believe the most important focus for aviation in reducing emissions will be the accelerating deliveries of the current generation of new aircraft. This also means that new to young aircraft produced in 2020 or just before will have a long working life of at least 20 – 25 years.

PART 2: AVIATION IN 2020: ASSESSING WHERE WE ARE NOW

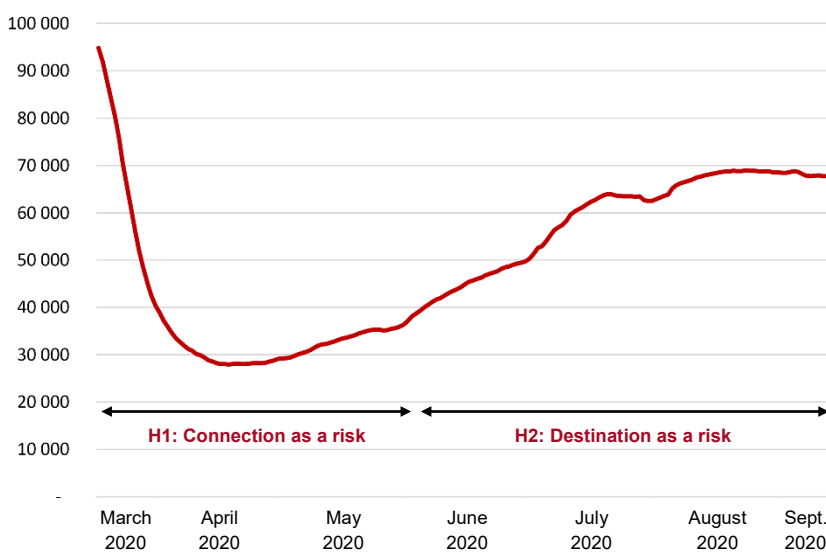
Phase 1: Connection risk

"We are in the middle of the biggest crisis in the aviation industry ever." –
Jochen Hörger, Managing Director of Aviation, KGAL

There could not be a stronger contrast than that between aviation in the very near future and the present.

Aviation in 2020 has been a story of survival. During the strictest lockdowns in April, the number of weekly flights fell by almost 70%. This left the skies around the world emptier than at any point in the last forty years.

Global Commercial Flights per day (7-day moving average)¹⁴



After this period of near shutdown, flights returned steadily, before levelling off in July and August to reach a certain "cautious plateau".

This marks a broad split in the year between roughly H1 and H2.

In the first half of the year, connection between countries was a serious disadvantage. Travel risked accelerating the advance of Covid-19 itself, and threatened to spread the disease's broader social and economic effects to new cities.

In the second half of this year, the fundamentals have shifted.

Phase 2: Destination risk

Now that the virus has become established in most countries and also (to varying extents) subject to mostly sustainable controls, travel between cities and nations is less of an immediate risk in itself. Air travel is no longer a primary vector of the disease into places where it is not present.

Airports and aircraft were perceived as potentially riskier locations, but this is now a more uniform risk around the world. Catching Covid-19 is no longer significantly more likely in a given airport than in a bar or restaurant in the same city.

We are yet to enter a third phase, when a more permanent mitigation against Covid-19 allows a fully-fledged reopening of borders and true confidence to return.

Yet global connection is slowly re-emerging as a strength instead of a weakness.

With travel restrictions still in place to the most dangerous hotspots, the odds are often similar in most potential destinations. This is not a completely comforting development, but it has given a good proportion of potential travellers enough confidence to fly again.

¹⁴ Data source: FlightRadar24, KGAL illustrations

Some markets have already returned to considerable growth. In particular, domestic markets within international travel borders (not crossing between disease control jurisdictions) have begun to anticipate the longer-term trends and return to the economic drivers of aviation growth.

For example, ironically compared to at the start of the crisis, China is now one of the very best stories of resurgence in travel and connection – occasionally slowed but fundamentally supported by local lockdowns.

Phase 3: Timing risk

“Aircraft leasing has rarely had a more important role to take – bridging the present and the future.” – Jochen Baltes, Managing Director GOAL Aircraft Leasing

The United States may be an example of a new, third phase of risk – in the final months of 2020 and the first half of 2021, risk to global connections is more likely to come from more indirect, second-order effects from the virus – not always alongside a second wave of Covid-19 itself.

This could include delayed health risks, delayed financial overhangs, or even geopolitical shocks as the economic impacts create anger.

Equally, however, there may be positive surprises such as a particularly effective vaccine.

Yet the immediate question remains; how quickly will this reconstruction of the global infrastructure of transport take place? Should airlines begin to stake out their market share? Or should they maintain focus on their cash balances and ability to survive another shock?

Only time will tell – but the mission of surviving in order to thrive in the near-future remains crystal clear.

Emerging behaviour

“Today, the biggest challenge is passenger behaviour.” – Stephan Gundermann, Head of Portfolio Management, KGAL

Inside the cabin, the most visible change in passenger behaviour is the wearing of masks. Simply due to considerations of comfort, this arguably reduces ticket sales for longer flights regardless of the virus situation at the destination. Mask wearing on board could remain a necessary discomfort for up to a year before some form of vaccine or alternative method of prevention becomes available.

One other major prospective upheaval was previously the suggestion to leave the middle seat free on seat rows with three seats abreast – or potentially even leaving the aisle seat free where two are seated abreast. However, this has not become standard practice – partly because it has been estimated that the impact remains relatively small, reducing the risk from Covid-19 on a full flight to one in three quarters of a million if middle seats are empty from just over one in half a million on a full aircraft^V.

Leaving middle seats free would, however, have been a far more significant challenge to some of the assumed economics of commercial flying. With break-even load factors generally at around 70% full, flying an aircraft with one third of seats empty is usually loss-making for most airlines.

“Middle-seat-empty” flights may yet emerge, however as a premium service – or more realistically a small portion of passengers may instead book a business class seat with a similar arrangement. Yet is likely to remain uneconomic for most airlines.

Outside the aircraft, one vitally important change in behaviour is the strong desire from passengers to minimise time spent in multiple airports and the associated virus risk. This factor could be a significant blow for “hub and spoke” airlines which previously aimed to purposefully funnel their passengers through a single airport as much as possible to enable economies of scale.

In the latter months of 2020, behaviour has also increasingly been influenced by the deepest global recession on record and its financial impact on households. However, while less than positive, we at KGAL believe that a return to economic restraint

on travel is a better scenario than a more severe lack of flying due to strict regulations, or due to a rational fear in response to a global pandemic.

In the past, higher oil prices have had a similar, though smaller, impact on the general affordability of flying – for all kinds of passenger. If this kind of situation or other precedents become useful analogies once more, we at KGAL believe this will be an initially positive sign of a return to normality and a more “precedented” situation.

Airlines: which business models will survive 2020?

Airline survival checklist: 2020

- **Cash reserves** (plus credit rating, government support)
- **Costs under control** (sustainable staffing, operating expenses, pension schemes and other liabilities)
- **Fleet efficiency** (e.g. A320neo)
- **Simplicity** (ideally a single aircraft type, simple corporate structure, clear marketing strategy)
- **Routes in a common travel zone** (e.g. EU Schengen Area, USA-domestic or Australia-NZ travel bubble)
- **Reputation** for flight safety and passenger health

“After Covid, the airline industry has to consolidate.” – Christian Schloemann, Managing Director GOAL Aircraft Leasing

Airlines have seen hundreds of billions of dollars in ticket revenue disappear over the course of 2020.

This has put the existence of some airlines at risk – and forced every single carrier to focus on survival. Not all airlines survived the initial contraction.

Airlines at the end of 2020 are divided most simply between those which have sufficient capital to survive the current crisis, and those which most likely do not.

Often this is a matter of whether a given airline is in receipt of government support and guarantees. Starting with reasonable operating reserves and a good relation with creditors has also helped some airlines.

Cash is king for now, but this will not be the case for ever. As some air traffic gradually returns, survival will increasingly depend on the ability of airlines to generate new revenue – rather than simply hoard reserves.

Discounting alone to generate ticket sales will not be a long-term solution either. Airlines that fail in the next phase, from Q4 2020 into 2021, will be those that cannot adapt to new ways of generating at least break-even revenues in the interim.

The next challenge will be surviving until Revenue Passenger Kilometres (RPKs) return to manageable levels – and in turn undiscounted revenue.

Legacy carriers have long been vulnerable to any form of shock due to their more complicated operations and higher cost base. Staff costs, fleet complexity and the operation of expensive hubs all add to the burden they face. Indeed, flag carriers may be good candidates for initial government support, but this needs to be balanced with possible government influence on business plans.

Certain more established legacy airlines and particularly flag-carriers tend, to have more loyal customers and a perception of better safety records. If this “reassurance” factor can be translated into extra sales in an era of uncertainty, or a continued premium, such operators may be able to service a slightly higher-end market in an adaptable way.

International point-to-point travel could also be a market for legacy operators with larger fleets capable of flying longer routes. However, as with the “reassuringly expensive” market, targeting more obscure routes or longer-haul travellers would again be targeting a small and increasingly delicate stream of revenue.

Low-cost regional airlines have simpler fleets (though not all are modern) and as the name would suggest a lower cost base to maintain while they await a return to passenger growth. Budget airlines already operating a point-to-point model will simply have more options when responding to shifting demand – especially in the most immediate future as travel restrictions remain changeable.

However, healthy and unhealthy airlines will not necessarily split easily into previously assumed categories.

Instead, fleets may be the most significant factor of all. Owning or having access to more narrow-body aircraft is likely to become a key determinant of survival in a market initially dominated by short-haul flights.

Finally, surviving a partial shutdown of global commercial aviation, while challenging enough, is also just the first chapter for airlines. They must also plan to run a sustainable business for perhaps 2 – 3 years during a time when passenger recovery may be slow, uneven and intermittent.

It may be that some airlines are too small, as well as some being too large. Consolidation of existing airlines appears very likely in coming years, allowing both a healthy adjustment in the numbers of competing carriers and the potential for better pooling of aircraft fleets.

To summarise, we at KGAL believe two things above all else now determine airline success:

- 1. Access to liquidity**
- 2. Access to fungible aircraft types.**

This is where financial experts should be able to help – but also where technical expertise matters as much.

Flightpath: aviation's expected timeline 2020 – 2025¹⁵

Index values 2019=100	2019	2020	2021	2022	2023	2024	2025
GDP (world)	100	95	101	105	108	111	114
Passengers (total)	100	45	73	94	104	111	118
Passengers (domestic)	100	49	79	100	108	115	121
Passengers (short haul)	100	42	66	85	97	105	112
Passengers (long haul)	100	29	53	79	90	99	107
Revenue Passenger Kilometres (RPK) (world)	100	36	64	88	98	106	113

¹⁵ Primary data source: IATA, Forecast: Oxford Economics, Index calculations based on 2019 calendar year by KGAL

PART 3: FUNDING THE FUTURE OF FLIGHT

Joining up the future and the present

“Aviation needs liquidity. Those able to provide it are in demand.” – Jochen Hörger, Managing Director of Aviation, KGAL

This paper outlines two key points in time, 2020 and 2025, where a degree of certainty is possible. How these two worlds join up in the intervening years is arguably far less certain.

It is the role of finance to join up the present and the future – to finance a solution.

As opposed to the previous Global Financial Crisis which then only in turn hit the world economy, the 2020 pandemic has created a radical short-term recession in the real economy – and as a result impacted almost all financial assumptions.

Particularly in the world of aviation finance, the impact of Covid-19 has filtered through a chain of institutions and financial securities. This includes airlines, leasing companies, banks financing airlines directly, and banks financing the leasing companies – alongside capital markets, shareholders and bondholders. Due to the nature of this chain, it is possible for problems in one element to build up before reaching another part of the system. It is possible many more airlines will go bankrupt in the next year.

However, the market for air travel will recover. There are just enough aircraft to provide enough flights in a modern, safe and efficient way at the right time. These fundamentals are unlikely to change dramatically, but who owns the aircraft when they are needed again could well do so.

Strong demand for aviation capital

“Thriving in the future requires survival skills in the present.” – Stephan Gundermann, Head of Portfolio Management, KGAL

Airlines worldwide still believe in the future market for aviation, but the vast majority simply do not have the luxury of looking that far ahead. In 2020, airlines are in survival mode, subject almost universally to restructuring processes and constantly searching for short-term liquidity.

“Sale and lease-back” deals are another way for airlines to unlock cash – from their balance sheet as opposed to from their operating costs. This can be thought of as a form of equity-release for aircraft-owning airlines. Many airlines are actively in the process of selling aircraft to certain leasing companies on this basis.

Vitality, this does not necessarily reflect a change in airlines’ belief in the value of an aircraft over its full lifetime, but quite simply the changed relative importance of the future compared to their own short-term cashflow and short-term fleet management.

At KGAL, we see continuing high levels of “sale and lease-back” deals, with some airlines urgently needing to execute these transactions. However, we are cognisant that, if airlines are stuck on pre-COVID assumptions, in terms of values, there could be challenges with not securing a reliable long term counterparty

However, we also believe these considerations demonstrate an important shift of power in favour of potential aircraft investors. Demand for aircraft finance is extremely strong, so there is much more opportunity to incorporate many of the security and collateral points that fell away for some market participants over the years. This puts anyone supplying aircraft finance at a potential advantage.

Scarce supply of aviation capital

“Liquidity has evaporated, and the question is: when will it return?” –
Christian Saur, Banking Relationship Manager, KGAL

Before 2020, competition existed between equity and debt players to source deals and claims against aircraft. This resulted in considerable liquidity for all kinds of aviation investors. But competition has been replaced by a shortage of investors able to invest sufficiently in aircraft for the long-term, either via equity or secured debt.

Layers of funding are provided by a number of key players in this market: governments (directly and indirectly), banks, and lessors. Occasionally aircraft manufacturers themselves will advance credit in addition to this.

However, the aviation capital structures supporting the airlines of the 2010s were already changing, and have now been transformed – if not temporarily destroyed – practically overnight.

Governments have grown in importance, though remain focused on short-term liquidity. State support globally reaches into hundreds of billions – though this is often focused on flag carriers.

Globally this support, both indirect and direct, was estimated at \$123 billion at the mid-way point of 2020^{VI}. In the United States alone, the CARES Act gives provision for of up to \$25 billion to qualifying US airlines in a single loan scheme.

Particularly regarding the supply of new aircraft, there has also been some speculation about a major return of export credit. This previously peaked in 2012, in a wave of governmental support from Export Credit Agencies (ECAs) that began during the previous financial crisis and recession – leading to significant involvement from European ECAs, and the Export-Import Bank of the United States which alone supported around 20% of Boeing deliveries during the peak of the (previous) financial crisis^{VII}.

This has led to some speculation that export credit could play a greater role once more in a new era of financial pressure. However, the policy pressures against supporting a carbon-intensive industry such as aviation are arguably much greater in the 2020s. Export credit may also be less likely in an age of greater protectionism.

Banks are now mostly in retreat from their aviation exposure. Previously, Boeing’s research^{VIII} into the financial structure of new aircraft purchases has tracked the steady rise of bank debt and capital markets as a proportion of aggregate aircraft purchase finance in the years leading up to 2019.

Yet since the very beginning of the pandemic, banks that have previously advanced considerable sums to finance aircraft have rapidly become some of the most cautious.

Banks’ behaviour in this market is currently driven more by group-level procedures, set across asset classes and departments, rather than expert judgement. Aviation banks are increasingly part of larger groups, usually part of corporate investment finance divisions, and increasingly subject to strict internal controls. Some relevant banks do specialise particularly in aviation, or the broader transportation sector. However, these firms are also subject to a period of change and possible future consolidation^{IX}.

Banks of all sizes and structures are especially restricted when funding new aircraft loans, as of late 2020, as they focus on restructuring existing portfolios.

This is despite all such players retaining a strong belief in the general advantages of securing debt against globally mobile assets such as aircraft – simply not in today’s market. Banks now tend to limit aviation loans to half of the appraised asset value instead of previously up to 80% LTV, while lending margins on aircraft loans tend to be double what they were pre-pandemic.

Arguably, banks have been forced by industry rating models and internal risk managers to overrule the judgement of their aviation experts. As a result, we believe that when a more liquid market for key aircraft models returns, banks have the potential to rapidly resume interest in funding the debt portion of aircraft capital structures. In the meantime, banks view such loans simply as debt at risk.

This could be seen as a brittle assumption by banks' risk departments. If banks were to strictly enforce aviation debts to the point of default, this may not help them at all in immediately recovering the value of their claim, given that selling the asset involved requires a market. There is no fair market for aircraft in 2020. This means tough negotiating by banks has a limit – if they enforce loans inflexibly in a way that simply results in default, then banks would be likely to become equity owners themselves.

Regardless of banks' willingness to lend against aircraft, for the equity investor with low leverage, the shortage of new debt financing for aircraft purchases presents an opportunity.

Aircraft lessors, by contrast to bank finance, are able to take a more entrepreneurial position by choice, and in a far more flexible way.

The role of aircraft leasing

"Out of all the ways to finance aircraft, equity investors are the best placed right now." – Christian Saur, Banking Relationship Manager, KGAL

These are challenging times for aviation funds, and KGAL's own funds have not been immune to these pressures, although we have managed to take appropriate action to recover assets where needed – and to work constructively with airlines to successfully return aircraft to the status of performing assets in many cases.

We have also witnessed a wave of interest from some airlines which didn't previously require leasing.

This is connected to the retreat of bank credit. While at KGAL we are very aware of levels of leverage. With banks no longer able to refinance beyond 50% loan-to-value ratios, this allows for a potentially advantageous negotiation.

Purchasing aircraft in 2020 can be achieved at a discount to even the short-term market resale price that could be achieved under more "normal" funding conditions. By negotiating on purchase prices to find a fair price for providing potentially medium-term liquidity, lessors and their underlying investors have a chance to complement other sources of finance.

In future, aircraft leasing may be conducted at a lower leverage ratio more permanently. If so, this would require significant growth in the aircraft leasing industry to replace the retreat of bank finance. KGAL would feel well placed to be involved in this scenario given our long history of sourcing such deals and arranging a low leverage structure.

Aviation capital structures after 2020

"When the risk-free rate is at or below zero, there is no such thing as a risk-free investment." – Frank Segger, Portfolio Manager, KGAL

Previously, around half of aircraft globally (by value) were leased, as opposed to owned by airlines themselves. There may be a tendency for that leasing ratio to increase as airlines rethink their funding requirements.

There will likely be a balance between the growth of government investment and that from lessors. This could vary considerably by airline, country and region. Continental European airlines, for example, are currently subject to greater control over their operations as a result of government bailouts, unlike those in the USA where state support has come with fewer caveats.

These differences could represent different eventual periods of government financial involvement.

When governments do disinvest and require the repayment of emergency loans, airlines will need to look once again to banks and capital markets, and even more so to lessors. At this point – likely within anywhere from two to five years – there could be another period of significant change.

While aviation funds such as KGAL's are going to be more important for airlines' financing, funds themselves need to source investors.

A greater variety of structures may support fund raising by some players. Structures such as Enhanced Equipment Trust Certificates (EETCs) tend to provide liquidity to a single airline. While there are many tranches within such a structure, this clearly lacks the breadth of multiple airline partners. Equally, other securities such as Asset Backed Securities (ABS) are linked to multiple airlines, however, they face challenges of deferrals and liquidity just like bank debt – and may not work as intended, for certain subordinated debt investors, in a challenging short-term environment.

For these reasons, we at KGAL are content with the structure of closed-ended equity funds.

Valuing aviation assets: what is an aircraft worth?

“There is a vacuum in the aircraft market. There’s only expert judgement – but price discovery will return.” –
Stephan Gundermann, Head of Portfolio Management, KGAL

Aircraft generate cash in two fundamental ways; by selling the aircraft or by selling the ability of the aircraft to move passengers and cargo. Neither of these activities could take place for a period in 2020, and both remain restricted – but cash is not long-term value.

Incorporating future expectations of both of these potential cashflows – and subjective to the perspective of the valuer, we operate internal models and careful analysis to match the engineering state of an aircraft today with the economic state of the aviation market over its likely lifetime.

There is no single answer to the question of what an aircraft is worth in 2020. For airlines, the value depends on their immediate survival, which causes them to undervalue aircraft. However, it is still very easy for others to over-value an aircraft. A lack of understanding of the type, or an incomplete engineering assessment of the individual craft could both lead to a very bad deal.

It was reported in *The Economist* as recently as August that some aviation funds have cut the value of A380 aircraft, not an aircraft type owned by KGAL, by more than 50%^X. Even in this example, the aircraft in question may not have achieved anything like this value if sold overnight. Published appraised values cannot be realised in a non-existent market or fire-sale conditions. Even if an aircraft is worth more as scrap and spare parts, realising that value takes expertise.

At KGAL, the value of all portfolio aircraft is estimated at any point in time based on expert engineering assessment of the condition of the aircraft, analogies with market prices both before and during the current pandemic, alongside the net present value of future yields over the likely lifetime of the aircraft.

Our experience over many years in this valuation process has allowed us to form a clear view of the likely future value of different aircraft. Type, and the broad category of an aircraft’s type such as a new-generation short-haul narrow-body, is an area of enormous divergence today. A380s will not come back. 757s will not be sustainable as pure-cargo craft once the passenger-aircraft cargo hold returns. The best buyer for a passenger 747 – 400 is probably now a museum.

Equally, those aircraft that are part of the compelling future of flight outlined in this paper are often undervalued for subjective and short-term – but inevitable – reasons by their current owners.

Importantly, this work has a broader purpose too – supporting airlines to stay in business for their employees and helping more people from all corners of the world to travel in a more sustainable and efficient aircraft.

Unlocking this value has a market value too. It is possible to buy into an asset with considerable future value, such as a 737 – 800 or an A320neo, at a very low market rate today. We are in a true sense fundamental, value investors in real assets.

CONCLUSIONS: WHAT IT NOW MEANS TO INVEST IN AVIATION

“Due to the unprecedented situation, investors can no longer expect to treat aircraft like an income generating bond, but they can buy a ticket to future returns along similar lines – and at a discount too.” – Florian Martin, managing director, sales at KGAL

Existing aviation investors already know what to look for in an aircraft fund. They are still correct, only they will rightly prioritise these factors in a radically different way in 2020.

For those with previous investments, the need to preserve capital is currently paramount. KGAL's base case scenario implies that existing investors will probably be able to enjoy similar outcomes to their original expectations, though over a longer timeframe. The main change is that it will take even more work from our teams.

Hard work to stabilise existing funds is a key priority for KGAL. It can involve very active management of the portfolio, careful stewardship and maintenance of aircraft and potentially the relocation of such assets.

At KGAL, our base case scenario for our continued aircraft investments is for a full recovery by 2024. This allows for a degree of flexibility and assumes short-term setbacks for the aviation market.

There may be a potential upside where opportunities arise to sell the lease earlier than its full term. Particularly in an optimistic scenario, the market value of aircraft could grow in anticipation of a clearer future “flightpath” for the industry. This means a large portion of additional returns may be realisable within a shorter timeframe of perhaps 2 – 3 years. However, investors in aircraft need to be able to look to this time horizon of five years or longer.

New aviation investments remain structurally similar to those made in previous years, but with a greater emphasis on a medium-term time horizon of 3 – 5 years minimum and a desire to capture the illiquidity premium associated with real assets such as aircraft.

Investors able to make fresh commitments in today's market may have a slightly greater appetite for risk-return pay-offs. However, while to some extent a “bullish” investment, a belief in the future of aviation is a belief in future global growth – one of the trends least likely to reverse over the long-term.

Lease rates and yields from 2020 will likely convert to a favourable environment. At KGAL, we have seen some potential “core” deals on the table that could create returns of 7% compound as opposed to potentially half this value in the pre-coronavirus era. This is primarily as a result of considerably discounted “entry values” to investments in aircraft – achieving the very best entry price is our priority.

Aviation investors certainly need to maintain caution. Right now, that also includes particular attention to leverage, ensuring that debt servicing is not too much of a burden or impediment to a long-term plan.

When a solution for the current pandemic emerges, the global economy and in particular aviation will reach a turning point. Those considering additional investment should grasp the opportunities as that turning point gets closer, and current investors should maintain their original timeframe. Everyone should look through and beyond 2020 to a much clearer and much brighter future.

APPENDIX: ABOUT KGAL & GOAL

As outlined in this paper, it is only through combining engineering, financial acumen and strategic focus that the best opportunities can be found. We believe that at KGAL we are extremely well placed for this market, in the strength of our team and the philosophy of our process built up over many decades.

More than 880 aircraft have taken to the skies as a result of KGAL transactions.

From KGAL's first aviation fund in 1979, 58 retail funds have followed, along with 81 private placements and other investment models. Since 2014, KGAL has been offering aviation portfolio funds for institutional investors, implementing an approach which involves purchasing several aircraft for a fund, with the effect of spreading investors' risk within the asset class. KGAL Group has close links with Lufthansa via two joint ventures, i.e. GOAL and Lufthansa Leasing, and these have enabled us to acquire a wealth of expertise along the entire value chain.

KGAL Group has a cumulative investment volume in aircraft funds of \$8.6 bn and an additional approx. \$17 bn in structured aircraft finance (Dec. 2019). Currently, we manage three active institutional aviation portfolio funds with more than 60 aircraft. These include: KGAL APF 1, KGAL APF 3 and KGAL APF 4. Our success is based on a combination of our asset expertise, active management of our funds, and on our financing and structuring ability.

Recent KGAL Institutional Aviation Funds

APF4: Latest iteration of the successful APF3 Fund with a total investment volume of approx. €600 million. This institutional club deal diversifies across different aircraft models and international airlines, and therefore enables both type-related and geographical spread across several lessees.

APF3: Institutional portfolio fund with fungible passenger aircraft. The Core Aviation Portfolio Fund located in the placement is a follow-on product from APF1, and closed in 2019 with investment volume of approx. €500 million.

APF1: Institutional portfolio funds with marketable passenger aircraft. The fund is fully invested with an investment volume of €800 million. The fund offers a broadly diversified spectrum of investment options across a range of aircraft types and international airlines.

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Contact

Jochen Hörger

Managing Director Aviation

KGAL Investment Management
GmbH & Co. KG
Tölzer Straße 15
82031 Grünwald
Germany

T +49 (0) 89 641 43 203
jochen.hoerger@kgal.de

KGAL Group

To date, the aircraft fund investment volume realised by KGAL Group totals more than €7.9 billion. Since the initial aircraft fund in 1979, KGAL has concluded transactions for more than 860 aircraft, 81 private placements and other investment models, as well as 58 retail and three institutional funds. KGAL Group is a leading, independent investment and asset manager with an investment volume of €20.2 billion. The investments focus on long-term capital investments for institutional investors in the real estate, infrastructure and aircraft asset classes. (As at 31/12/2019)

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