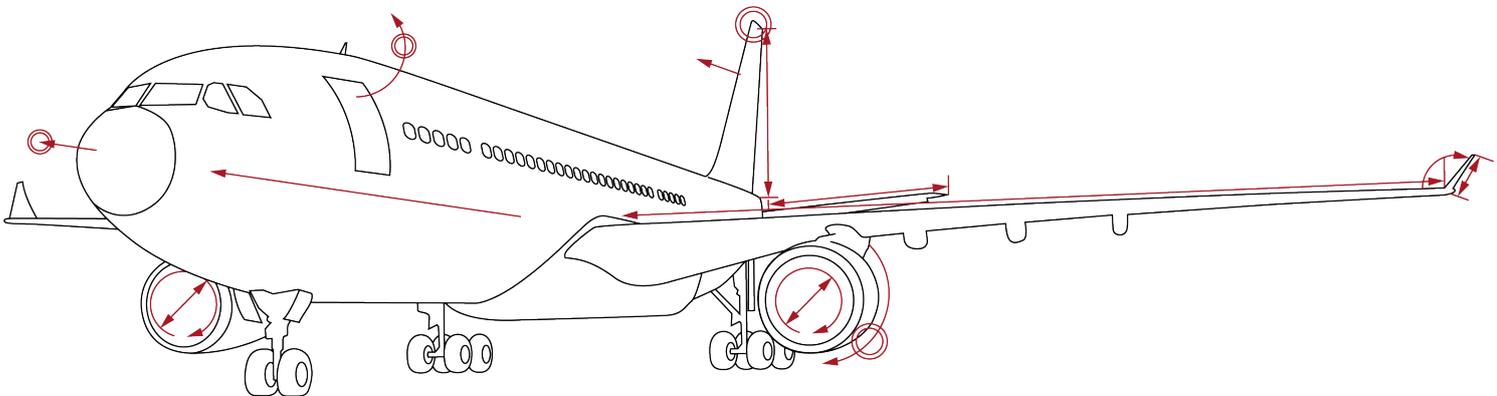


THE POST-PANDEMIC AVIATION MARKET

NARROWBODIES TO LEAD POST-COVID-19 AVIATION RECOVERY

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EXECUTIVE SUMMARY

- KGAL expects the aviation industry to recover from the current severe shock and return to a moderate growth path
- KGAL predicts, based on its analysis of several studies and its own track record over more than 40 years, a "new normal" state based on 80 percent of the pre-Coronavirus level. On this basis, global air traffic will return to pre-crisis levels in 2024
- But this recovery will start focused – led by short and medium-haul routes on modern and more efficient narrow-body aircraft
- Once this recovery is underway, versatile narrow-body aircraft will face the strongest demand
- Yet this is at odds with short-term financial forces. Today, many airlines are currently decommissioning and selling narrow-body aircraft due to unavoidable capital and liquidity bottlenecks
- This contrast creates an immediate opportunity for aircraft leasing companies and investors, to acquire aircraft at favourable conditions and then lease them to airlines
- Such opportunities also provide a mechanism to support the aviation industry through crisis. In a win-win situation for both airlines and investors, airlines receive urgently-needed capital and liquidity at short notice. Investors, in turn, lay the foundations for future business growth and identify attractive investment opportunities for the capital entrusted to them
- KGAL and GOAL intend to provide investors with aircraft investment opportunities currently providing favourable pricing in times of a stressed market. Hands-on asset and technical management, plus decades of experience, further supports this.
- The cornerstone of the proposed investment strategy is to invest in a well-diversified portfolio of young, modern sale-and-lease-back structured narrow-body aircraft. This strategy will operate alongside GOAL, a joint venture between KGAL and Deutsche Lufthansa (60% / 40%), with additional 20-year experience in operating aircraft leasing.

INTRODUCTION

The COVID-19 pandemic and its consequences for the economy, trade and transport worldwide have hit the aviation industry particularly hard. For example, at Frankfurt Airport, one of the most important aviation hubs in Europe, the number of passengers travelling in April 2020 was down 97 percent and the number of aircraft movements down 85 percent from the same month last year.¹

Airlines now face a global liquidity squeeze, as a result. Almost all the world's airlines have temporarily shut down a large proportion of their fleets. Liquidity bottlenecks are a widespread threat which can often only be averted by short-term emergency loans and/or equity capital support from the public sector. Further information on the effects of the corona crisis can be found in the KGAL whitepaper "[The Corona Virus Pandemic – Impact on the Aviation Market](#)" dated April 9, 2020.

In many countries in Europe and around the world, the ebbing rate of infection has currently made it possible to relax corona-virus containment measures. Nevertheless, no one can predict at this point in time how long the current situation will continue and whether further waves of infection can be expected. However, it seems unthinkable that the pandemic will not eventually come to an end. The question is how the aviation industry will develop until then and in the future.

So far, aviation has overcome every major crisis relatively quickly and has been able to return to its long-term growth path. Losses in the number of passengers or freight have always recovered. Whilst more profound, it is reasonable to expect that this time it will be no different.

This whitepaper examines which sub-segments of air traffic will show signs of recovery first. Based on this, possible strategies for aircraft investors are already emerging.

1. AVIATION BETWEEN GROWTH AND CRISIS

In the past, international aviation has shown exceptional growth. The long-term average in the development of Revenue Passenger Kilometres (RPKs) over the past 20 years amounts to approximately 5.5 percent and thus exceeds the long-term growth path of the worldwide gross domestic product (GDP).^{2, 3} Global air traffic has doubled approximately every ten years since 1970.⁴

Nevertheless, the aviation industry has proven to be sensitive to economic cycles. Crises can result in relatively severe slumps without any time lag but, in the past, it has been possible to recover from these within a comparatively short time.

¹ Source: <https://www.fraport.com/de/newsroom/pressemitteilungen/2020/q2-2020/fraport-verkehrszahlen-im-april-2020--massiver-passagierueckgang.html>

² Source: IATA, 13/12/2019: Economics' Chart of the Week

³ Information on historical data does not purport reliable indications for future developments

⁴ Source: Airbus Global Market Forecast 2019 – 2038

Pre-Corona Global Annual Air Traffic and Post-Corona Forecast

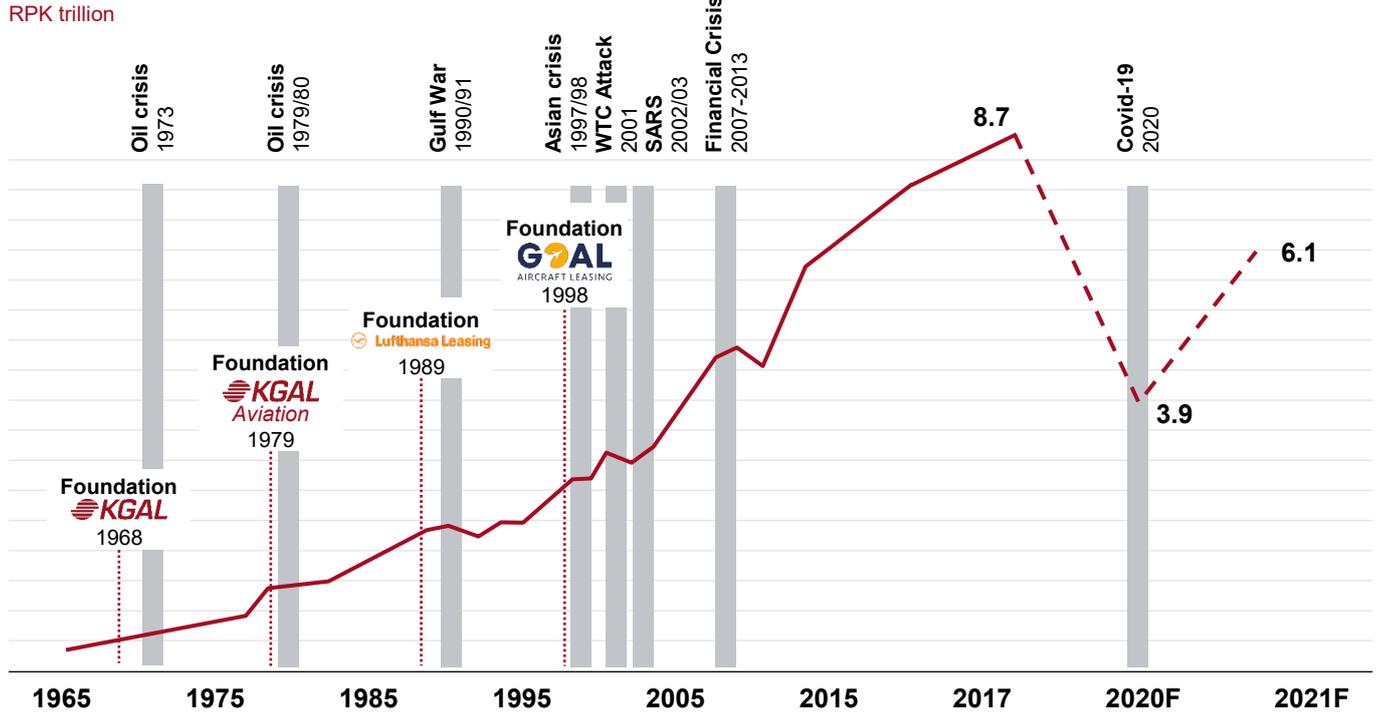


Chart 1: Pre-Corona Global Annual Air Traffic and Post-Corona Forecast⁵

At the same time, the passenger airlines sector is highly competitive and capital intensive. Profit margins are relatively low for many airlines and there is constant pressure for consolidation in the industry. Although the industry has shown continuous growth and profitability over the past ten years⁶, individual insolvencies have been observed, such as that of Air Berlin in 2017 and Flybe in 2020.

Pre-Corona Net Profits of Airlines and Post-Corona Forecast

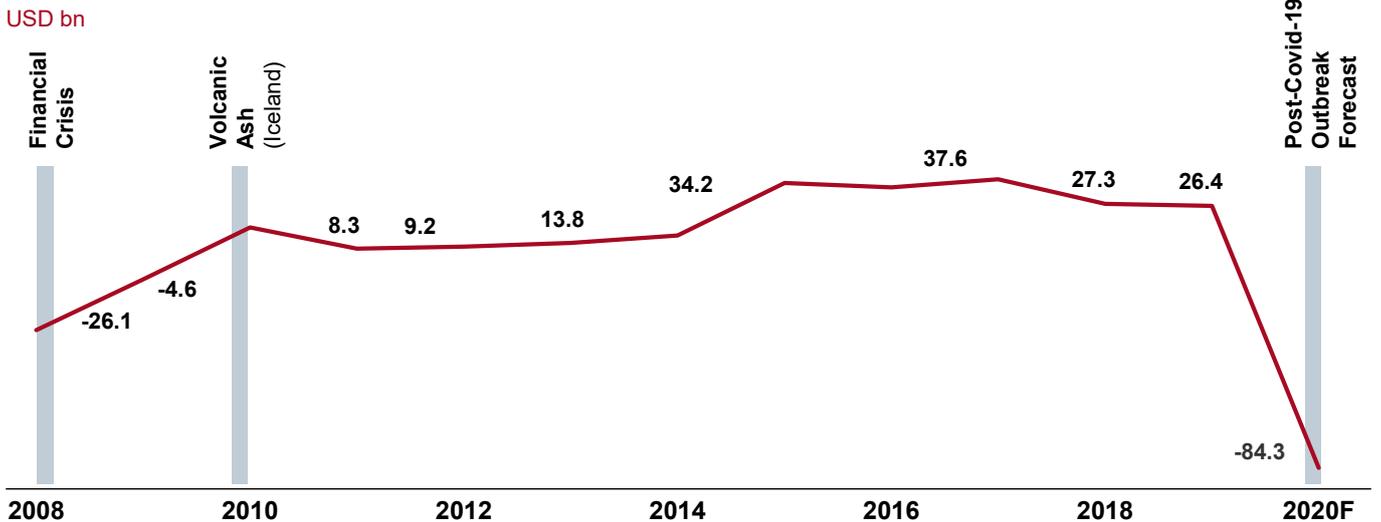


Chart 2: Pre-Corona Net Profits of Airlines and Post-Corona Forecast⁷

⁵ Sources: Airbus Global Market Forecast 2019 – 2038; IATA, 9th June 2020: Economic Performance of the Airline Industry

⁶ Source: IATA, Dec. 2019: Fact and Figures

⁷ Sources: IATA, Dec. 2019: Fact and Figures; IATA, 9th June 2020: Economic Performance of the Airline Industry

2. THE HISTORIC IMPACT OF CORONAVIRUS

In a historically new scale of setback, the COVID-19 pandemic has led to a historic slump in passenger numbers due to severe travel restrictions and a sudden drop in demand. According to the International Air Transport Association (IATA), RPKs worldwide are expected to decline by 54.7 percent from 8.7 bn in 2019 to 3.9 bn RPKs in 2020 as a whole.⁸ During the strict lockdown in Europe in the months of March, April and May, the slump in passenger numbers at almost all major airports amounted to more than 90 percent – more than at any time since the end of the Second World War.

Updated 2020 Forecast on Change of Passenger Numbers and Revenue

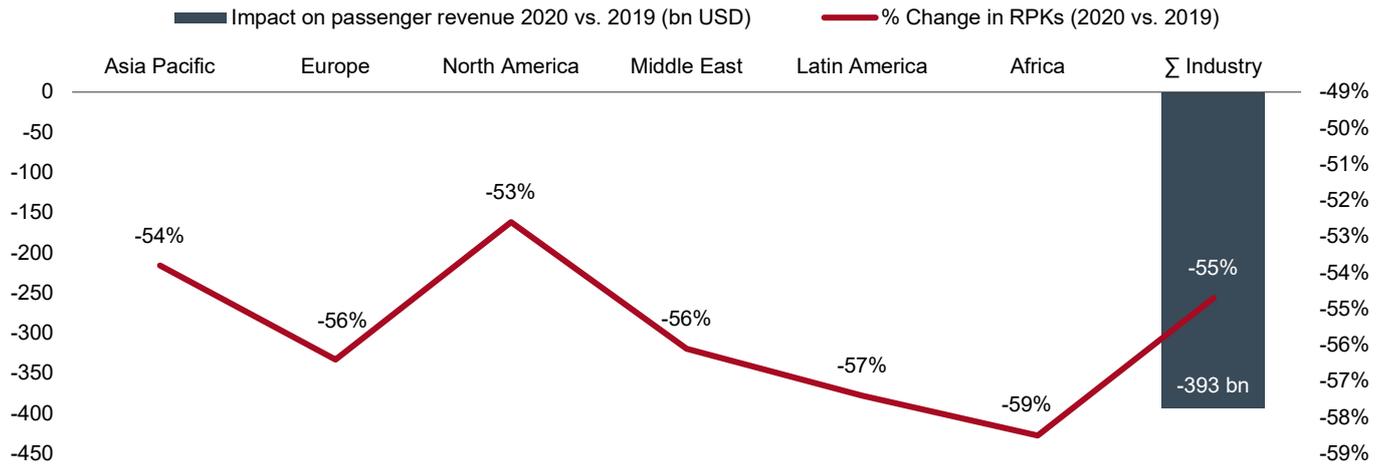


Chart 3: Updated 2020 Forecast on Change of Passenger Numbers and Revenue⁹

The duration of the recovery of the demand in air travel will be influenced by the global recession and weaker consumer confidence. Assuming that travel restrictions will be gradually lifted over the coming months, KGAL expects, based on its analysis of several studies and its own track record over more than 40 years, a return to the "new normal" state based on 80 percent of the pre-Coronavirus level. On this basis, global air traffic will not return to pre-crisis levels until 2024. Although growth rates will be positive again from 2021 onwards, they will fall short of the forecasts made before the Coronavirus crisis for many years.

Forecast: Global Air Traffic Scenarios in bn RPKs

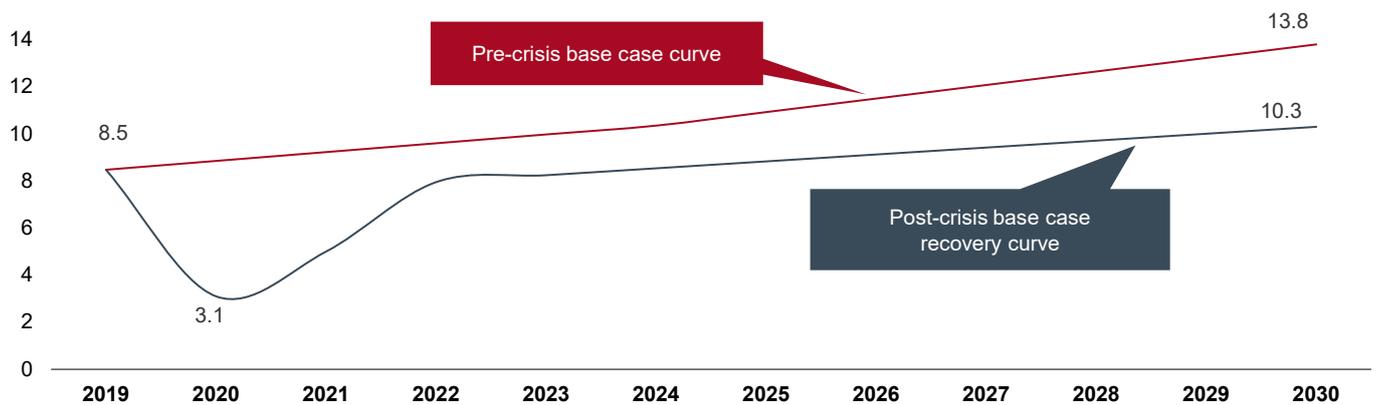


Chart 4: Forecast of Global Air Traffic Scenarios in bn RPKs¹⁰

⁸ Source: IATA, 14/4/2020: COVID-19, Updated impact assessment of the novel Coronavirus

⁹ Source: IATA, 9th June 2020: Economic Performance of the Airline Industry

¹⁰ Source: Roland Berger (<https://www.rolandberger.com/en/Point-of-View/COVID-19-How-we-will-need-to-rethink-the-aerospace-industry.html>)

The consequence of this crisis is a reduction in the required fleet, impacting the demand for new passenger aircraft. Prior to the crisis, demand was forecast to reach 21,760 aircraft by 2030, 13,050 of which would be used to expand capacity and 8,710 to replace older aircraft. Roland Berger's forecast is now 27 percent lower. According to this, demand up to 2030 will still amount to 15,840 new units, of which 8,320 will be for fleet expansion and 7,520 as replacements. This corresponds to 1,580 new aircraft per year.¹¹

Forecast: Expected Long Term Development

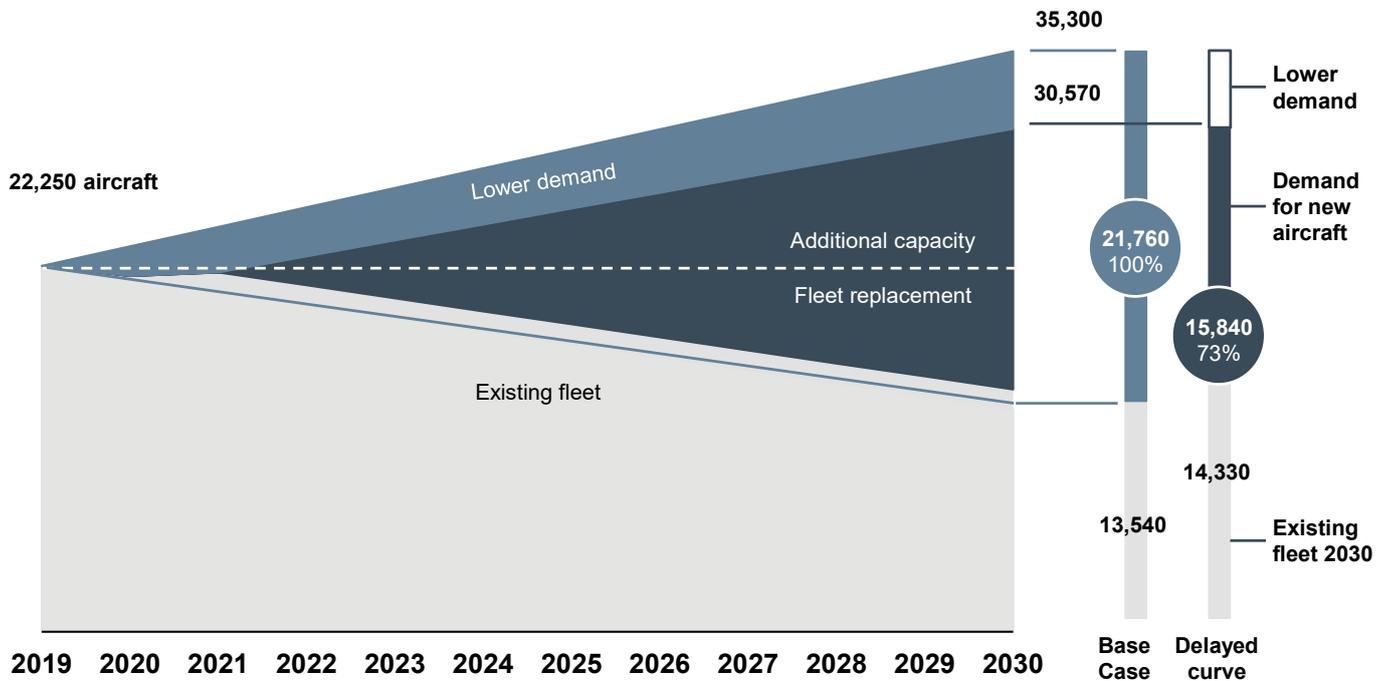


Chart 5: Forecast of Expected Long Term Development¹²

The two market leaders Airbus and Boeing cut aircraft production by around 45 per cent in the first quarter.¹³ Nevertheless, their order books are sufficiently full to maintain production in the coming years – even if we expect isolated cancellations of orders by various airlines in the coming months.

¹¹ Source: Roland Berger (<https://www.rolandberger.com/en/Point-of-View/COVID-19-How-we-will-need-to-rethink-the-aerospace-industry.html>)
¹² Source: Roland Berger (<https://www.rolandberger.com/en/Point-of-View/COVID-19-How-we-will-need-to-rethink-the-aerospace-industry.html>)
¹³ Source: Airbus and Boeing website (order delivery statistics as of March 31, 2020)

3. PRICING DEVELOPMENT AND INVESTMENT OPPORTUNITIES IN THE AIRCRAFT MARKET

In previous crises, the market value of aircraft has fallen by an average of around 15 per cent and the leasing rates of new contracts have fallen by around 25 per cent in the short term. In most cases, a recovery set in after about two years.¹⁴ Over the course of the Coronavirus crisis, however, KGAL has observed a stronger decline of market values and lease rates in the short-term. A recovery in demand is expected as air traffic gradually picks up speed again.

Estimated Market Values of Aircraft

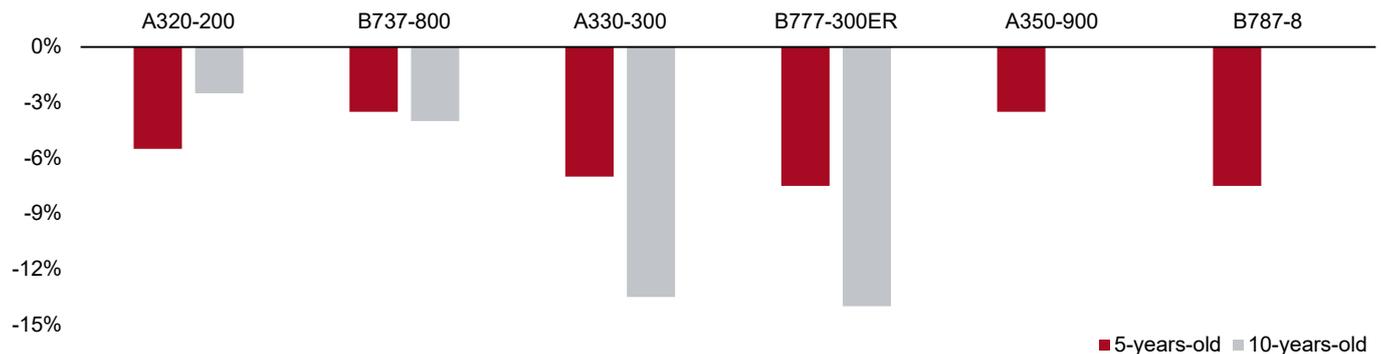


Chart 6: Estimated Market Values of Aircraft¹⁵

Estimated Lease Rates of Aircraft

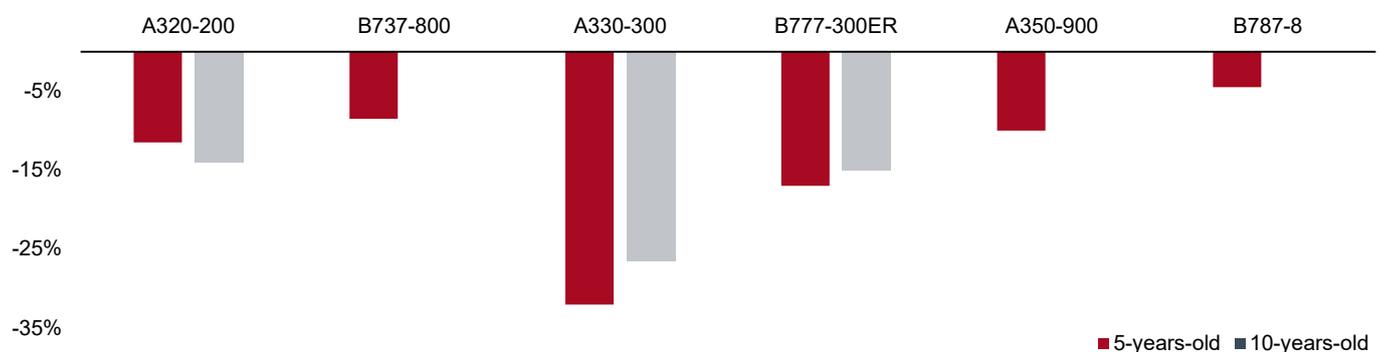


Chart 7: Estimated Lease Rates of Aircraft¹⁶

However, a large part of the global aircraft fleet is currently on the ground. The owners – predominantly airlines – have to pay standing fees for the parked aircraft and at the same time suffer from a lack of turnover and liquidity restrictions. As already mentioned, full capacity requirements are not expected to be reached again for several years. Some older aircraft types may not even be put back into service by all airlines and will ultimately be decommissioned. We expect this to apply, for example, to wide-body aircraft like the Airbus A340 or, to some extent, the Airbus A380 and the Boeing 747-400.

In light of this, numerous airlines will be faced with the decision to part with some of their temporarily decommissioned fleet. In addition, a further consolidation of the airline industry as a result of the crisis is to be expected. This may result in selective opportunities for investors who are convinced of a long-term recovery in global air traffic to acquire new units at comparatively favourable prices.

¹⁴ Source: Ascend by Cirium: <https://www.youtube.com/watch?v=QsTcbdFAVaA>

¹⁵ Source: Ishka Global “Aircraft Values and Lease Rates: What happens next?” 8 April, 2020

¹⁶ Source: Ishka Global “Aircraft Values and Lease Rates: What happens next?” 8 April, 2020

4. DOMESTIC AND SHORT / MEDIUM-HAUL FLIGHTS WILL BE THE FIRST TO RECOVER

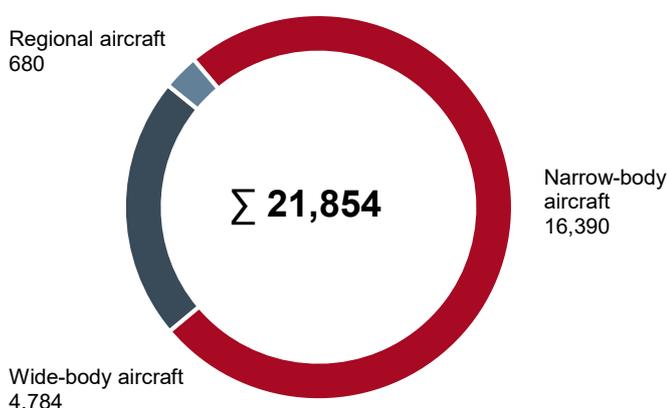
As a result of the relaxation of Coronavirus measures, short and medium-haul flights will be the first to resume, especially in national air traffic and medium-haul routes (e.g. intra-European), as a consequence of regulatory, political and individual customer constraints. This has already been observed in previous crises. For many economies, the operation of a national air traffic network represents an essential infrastructure service. For this reason, KGAL expects in its base case that domestic traffic and, to some extent, intra-continental traffic to return to its pre-crisis level as early as 2022, while inter-continental traffic will not return to its pre-crisis level until 2024.

As a result, narrow-body aircraft for short and medium-haul flights will be the first to be taken off the parking lots on a larger scale to resume flight operations. Narrow-body aircraft such as the Airbus A320 family and the Boeing 737 series are the backbone of the aviation industry. They currently account for around three-quarters of the world's aircraft fleet and are used by virtually every major airline – currently more than 800 – worldwide, particularly by the very competitive low-cost carriers.

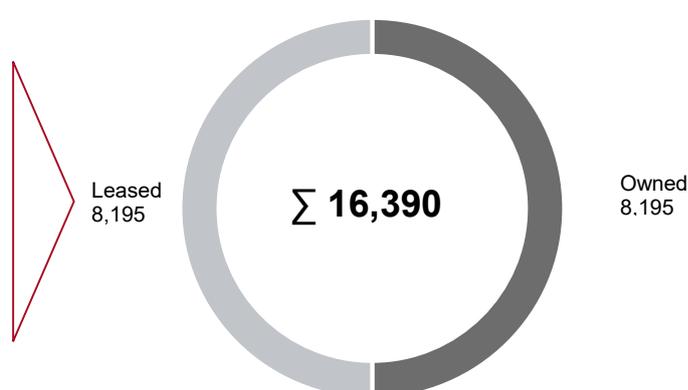
These characteristics make them by far the most investable and tradeable aircraft class, and thus the most attractive for investors, regardless of the current Coronavirus crisis. These models offer excellent repositioning flexibility and can be converted for use by another airline quickly for a relatively low cost.

About half of this fleet consists of leased units; the other half is owned by the airlines. Since many airlines need short-term liquidity due to the crisis and need to strengthen their capital positions, an increase in the leasing ratio is expected.

Category Split of Total Global Passenger Aircraft¹⁷



Today's Total Global Narrow-Body Aircraft¹⁷



In addition, the airlines will be the first to put the youngest units in their fleets back into service. Younger aircraft are generally more efficient, consume less fuel and generate less noise, and are therefore more economical than older models. With the A320neo, Airbus offers a new and competitive aircraft type. KGAL expects Boeing to solve the current problems with the equally efficient direct competitor model, the Boeing 737Max, in the foreseeable future. The airline industry will rely heavily on these two aircraft types going forward.

In the medium term, international long-haul traffic will also pick up again. We expect that the first aircraft types to be used for this purpose will be the modern and very efficient Airbus A350 and Boeing 787. We also expect that older types such as the Airbus A340 or the Boeing B757 and B767, as well as the A380 and the B747-400, will resume to service at a later stage, unless airlines, such as Emirates, are dependent on these aircraft types. For some of these units and probably also for entire series, the Coronavirus crisis may mean the end of commercial operation.

¹⁷ Source: CH Aviation (aircraft database as of April 23, 2020 and Roland Berger (<https://www.rolandberger.com/en/Point-of-View/COVID-19-How-wewill-need-to-rethink-the-aerospace-industry.html>))

KGAL'S RECOMMENDED INVESTMENT STRATEGY IN THE CURRENT MARKET ENVIRONMENT

KGAL's Investment Strategy at a Glance:

- Provide investors with anticyclical investment opportunities currently providing favourable pricing in times of a stressed market
- Invest together with GOAL in a well-diversified portfolio of young, modern narrow-body aircraft
- Robust risk mitigation through GOAL's 20 years of proven asset and technical management skills, which is key in times of turmoil
- Strong alignment of interest inter alia through a USD 20 mn direct investment from GOAL
- 8-year closed-end vehicle, targeting USD 200 mn capital
- Targeting 10% net IRR and net average cash-on-cash yield of 5% p.a.

The cornerstone of the proposed strategy is to invest in young, modern sale-and-lease-back structured narrow-body aircraft, which have the largest market share among all aircraft categories worldwide. As outlined in the previous section, an important characteristic of narrow-bodies is their flexibility in terms of flight routes; i.e. due to their seat capacity of around 150 – 200 seat and their flight range of up to 3,000 miles, they can be used with high load factors for short and medium-haul distances.

Whereas wide-bodies are considered to be more efficient for long-haul routes, they are also less flexible due to their large seat-capacity, and are often only flying at full capacity during holiday seasons. In addition, as KGAL and GOAL strongly believe that as the domestic routes and generally shorter flight routes are expected to be re-introduced much sooner in the COVID-19 crisis, the narrow-bodies will be generating revenues sooner and therefore their market values and lease rates are considered to be more stable.

Furthermore, whilst we remain in the grips of this crisis and demand for aircraft remains low, airlines are being forced to adapt their fleet planning for the future. Retirements of older aircraft are now being accelerated, especially aircraft types that are already out of production or close to it. That is why only carefully selected aircraft types will be acquired for the proposed investment strategy. Please find an overview of aircraft types that KGAL / GOAL considers as crisis winners, or currently out of favour, and those that are considered to be the "dead end" and are therefore excluded from the proposed investment strategy in the chart below.

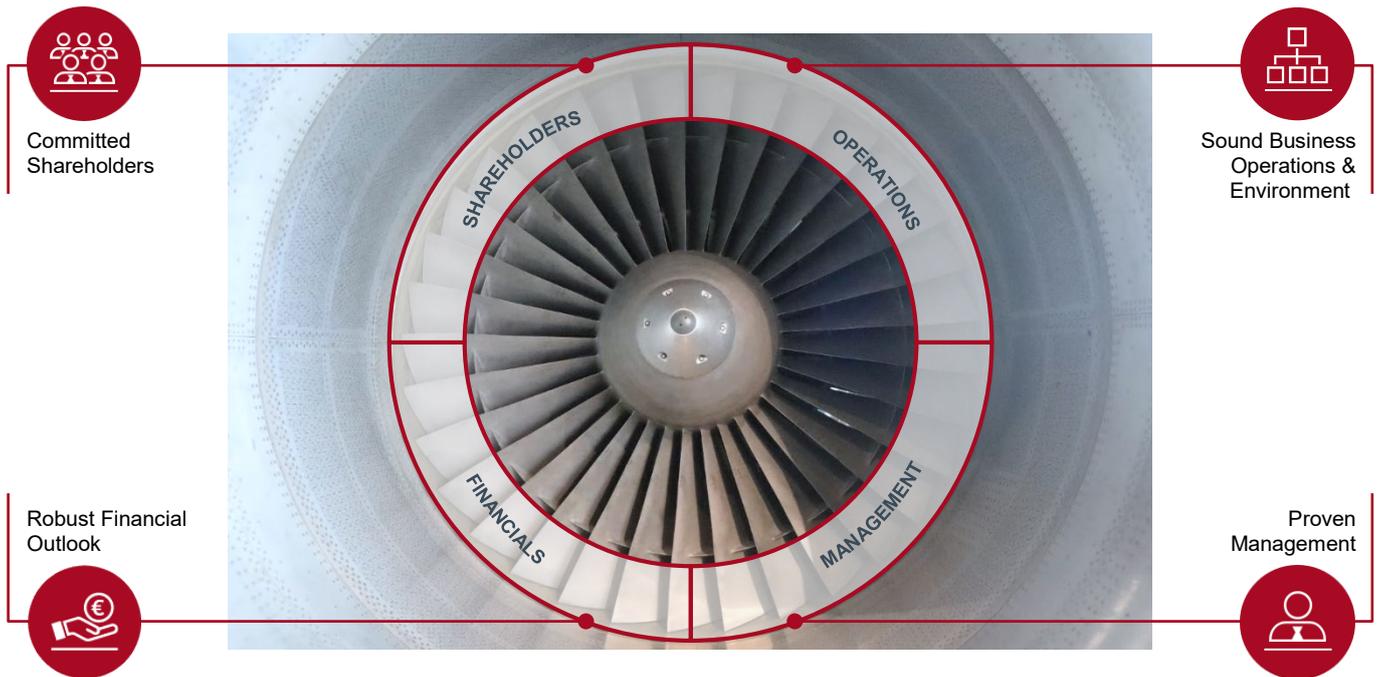
KGAL's Aircraft Type Assessment at a Glance:¹⁸

Crisis Winners	Currently out of Favour	Dead End
<ul style="list-style-type: none"> • Airbus A220/ A320neo/ A321neo • Airbus A350-900 • Boeing B737NG • Boeing B787-9 • Boeing B737MAX¹⁹ • Freighters and passenger aircraft with cargo capability 	<ul style="list-style-type: none"> • Airbus A319/ A320ceo/ A321ceo (depending on age) • Certain Airbus A330s/ A350-1000 • Boeing B777-300ER/ B787-10 • Dash8-Q400 • Embraer E1s • Bombardier CRJs 	<ul style="list-style-type: none"> • Airbus A340 • Airbus A380 • Boeing B737 classic • Boeing B757/ B767/ B777-200ER • Boeing B747-400s

As mentioned above, the strategy foresees investing in narrow-body aircraft that are purchased and leased back to airlines to generate ongoing income for the investors. Regarding the selection of lessees, please find an overview of the desired profile below.

¹⁸ Sources: KGAL / GOAL and Ishka Transaction Economics Situation Report Week of 30 March 2020 and GOAL Aircraft Leasing (28 April 2020)

¹⁹ Once approved for operation



To assess all relevant parameters of aircraft transactions, KGAL / GOAL has developed a proprietary deal evaluation tool, which evaluates the aircraft, the lessee credit, and the security package. This tool gives a balanced view of risk for each transaction.

CONCLUSION AND OUTLOOK

- The aviation industry has experienced very strong growth in recent decades. Although the growth was cyclical and sensitive to crises and economic cycles, temporary slumps were generally made up for very quickly. Particularly with the further liberalisation of air traffic and the emergence of low-cost carriers at the turn of the millennium, growth experienced a further boost, but the intensity of competition also increased sharply
- The short and medium-haul aircraft of the Airbus A320 and Boeing 737 series have become the cornerstone of global air traffic in recent decades
- However, the Coronavirus crisis is proving to be one of historic proportions for global aviation. Not since the end of the Second World War has the slump in passenger traffic, in comparison with the previous year, been anywhere near as severe as in March, April and May 2020. Even airlines with an established and profitable business model have run into liquidity bottlenecks within a very short space of time and are in some cases dependent on government support
- If the measures to contain the Coronavirus pandemic are slowly scaled back and the crisis gradually comes to an end, the currently parked aircraft of the A320 and Boeing 737 short and medium-haul fleets will be the first to be gradually put back into service
- As a second step, the modern and particularly efficient long-haul aircraft A350 and Boeing 787 will follow
- Older models will be largely decommissioned
- The current environment offers investment opportunities for aircraft investors, as some airlines are seeking more financing for their existing and future fleet due to ongoing capital and liquidity constraints
- The herein described investment strategy from KGAL and GOAL responds to this current environment and provides investors with anticyclical investment opportunities currently providing favourable pricing in times of a stressed market

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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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