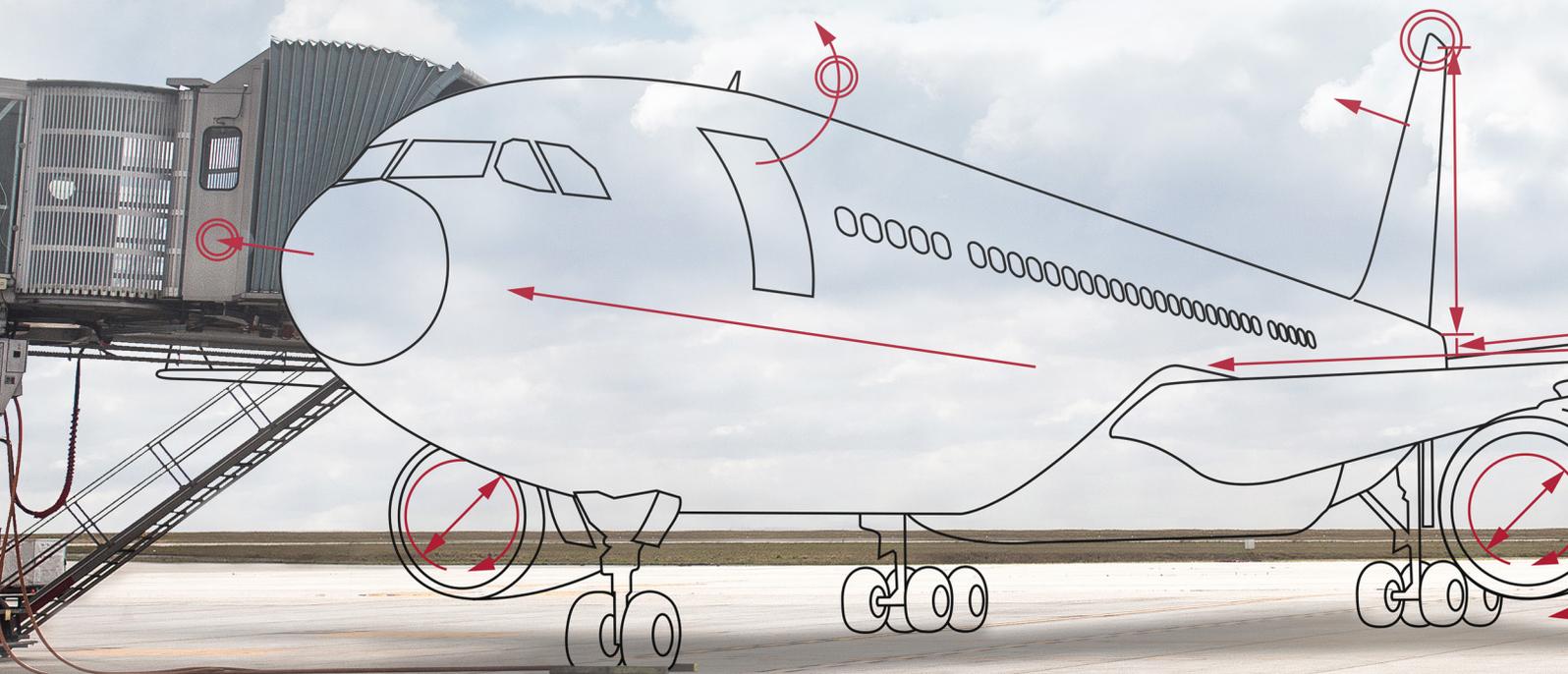


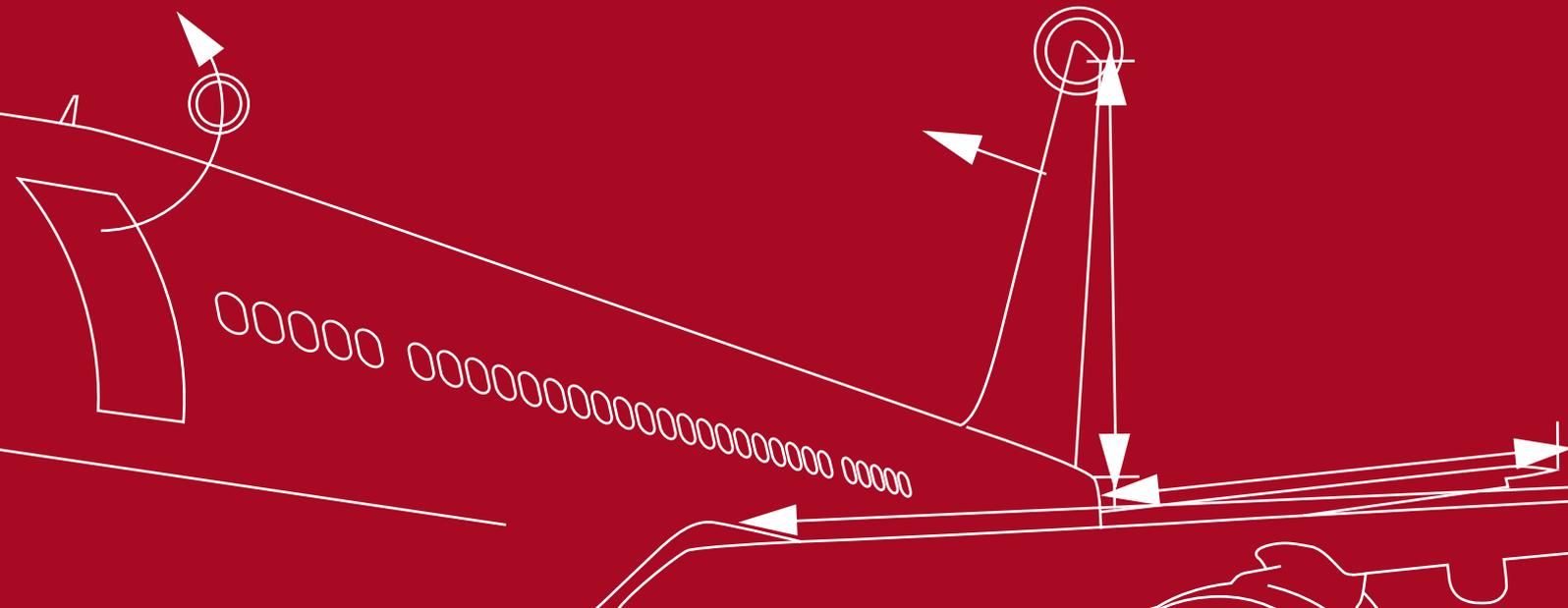
HY2, 2018

PERSPECTIVE AVIATION MARKETS



JOCHEN HÖRGER, MANAGING DIRECTOR OF AVIATION
KGAL INVESTMENT MANAGEMENT GMBH & CO. KG

RISING OIL PRICES FUEL DEMAND FOR NEW AIRCRAFT





At \$50 per barrel, the price of crude oil was not going to get any higher – that was the consensus of opinion in the aviation industry two years ago. Today a barrel of oil costs around \$75. This upward trend is powered by factors such as geopolitical tension and limited supply. There is little indication of when – or if – it will end.

Oil prices play a crucial role in airlines' costings, typically accounting for 20-30% of operating costs. In recent years the industry has benefited from comparatively low oil prices and an abundant supply; now the time has come to take action.

The impact of climbing prices can be somewhat cushioned in the short term through hedging, which is standard procedure across the industry. However, if oil prices keep heading upwards, increased costs will make their impact felt and the focus will inevitably shift back to fuel efficiency, which is by no means solely dependent on engine efficiency. Other criteria for consideration include construction material, for example, the weight of a Boeing 787 can be reduced by up to 20% by using composite materials such as carbon fibres instead of conventional materials.

Ultimately though, the route profile is the decisive factor when it comes to efficiency. To use figures to illustrate this, the Airbus A320neo (new engine option) costs around \$5 million more and consumes 15-20% less fuel than the predecessor model A320ceo. Greater fuel savings can be achieved on longer routes than on shorter routes. So the point at which the higher capital cost for the A320neo begins to pay off depends mainly on the operating profile of the airline in question.

There is also no doubt that airlines will try to increase ticket prices in the medium term.

Given the already high degree of capacity utilisation, in excess of 80%, there is little leeway to increase the passenger load factor even further. In light of this, we expect that airlines will choose to change the type of aircraft they use. The environment of low fuel prices have led to less efficient aircraft remaining in service for longer than usual over the last few years, but we should now see an increase in orders for new aircraft models. It is quite clear that aircraft continue to be in demand. Last year saw an above-average increase in passenger figures of 8.1% (the average over the last 10 years was approximately 5%), and the International Air Transport Association (IATA) is forecasting an increase of around 7% for this year. The airline industry is still, very much, a growth market.



"FOR EXAMPLE, THE WEIGHT OF A BOEING 787 CAN BE REDUCED BY UP TO 20% BY USING COMPOSITE MATERIALS SUCH AS CARBON FIBRES."

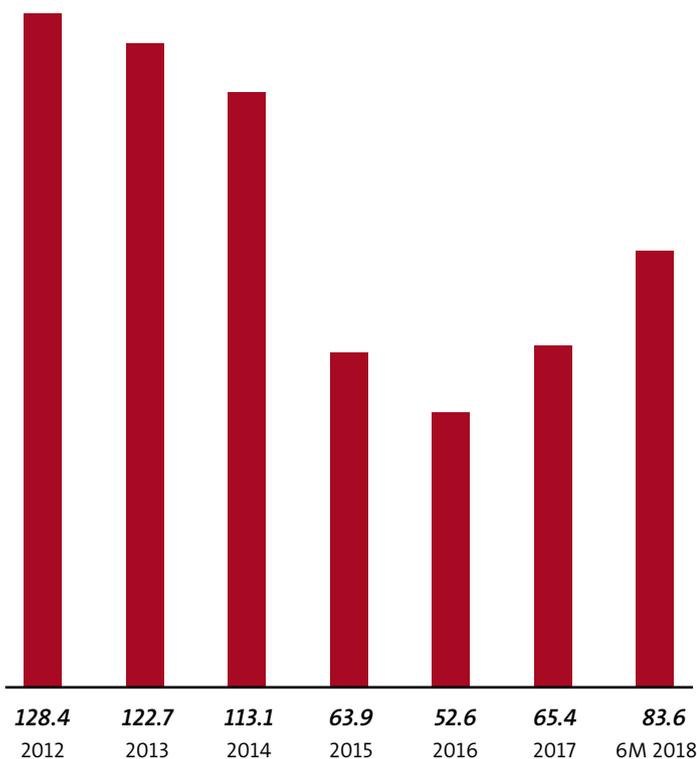
"IT IS QUITE CLEAR THAT AIRCRAFT CONTINUE TO BE IN DEMAND. LAST YEAR SAW AN ABOVE-AVERAGE INCREASE IN PASSENGER FIGURES OF 8.1%"

"THE AIRBUS A320NEO COSTS AROUND \$5 MILLION MORE AND CONSUMES 15-20% LESS FUEL THAN THE PREDECESSOR MODEL A320CEO."



FOCUS ON MARKET DATA

FUEL PRICE (AVERAGE PRICE USD/B)



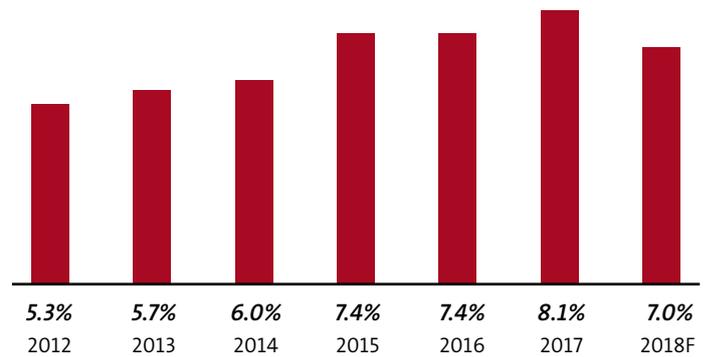
83.6\$

Changing trends in oil prices: In 2015 and 2016, a significant oversupply drove prices down. Since 2016, the price of kerosene has increased by more than half – and the trend is continuing in that direction.

GROWTH IN PASSENGER FIGURES

+7.0%

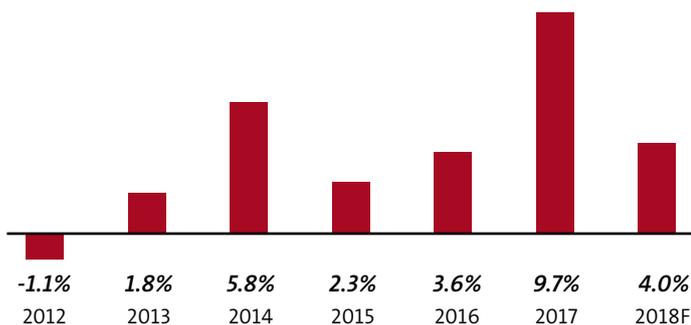
At high levels: Passenger figures grew by around 5% each year over the last ten years. With current growth of 7% expected, the airline industry remains a high-growth market.



GROWTH IN FREIGHT VOLUMES

+4.0%

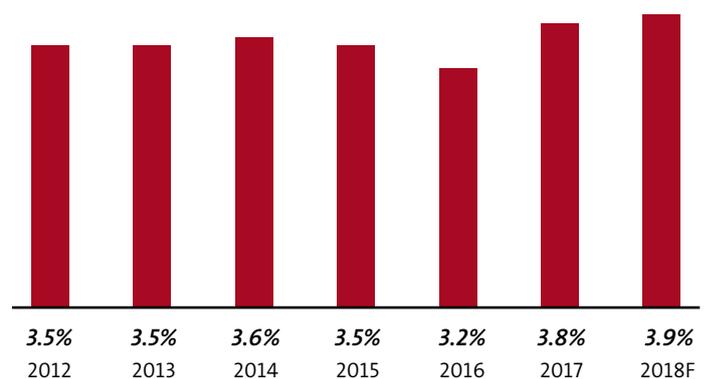
Difficult to assess: Freight volumes are far more volatile than passenger figures. In 2017, growth was notably high at 9.7%.



GROSS DOMESTIC PRODUCT

+3.9%

Continuous growth: Global gross domestic product has remained at a consistently high level over recent years. However, the impact of a possible trade war between the USA and China or the European Union is difficult to predict.



MICHAEL KÜHNEL, TRANSACTION MANAGEMENT
KGAL INVESTMENT MANAGEMENT GMBH & CO. KG

AIRCRAFT ARE LIQUID ASSETS AND CAN BE TRADED WORLDWIDE

Everything you know about share investments also applies to aviation: Investment strategies are based on risk appetite, return assumption and investment horizon. Key criteria include selection of assets, operator and lease period. Michael Kühnel is a trained A320 pilot and works in Aviation Transaction Management. He tells investors everything they need to know about aviation.

Narrowbody

A narrowbody is an aircraft with a centre aisle for short-haul and medium-haul routes.

Finance lease

A finance lease is a contract which stipulates that the financial opportunities and risks of ownership lie with the lessee.

Midlife asset

A midlife asset is an aircraft which is around 8-15 years old. The lease terms for these assets are often shorter than those of new aircraft.

When it comes to shares, we all know about DAX companies. With aircraft, we talk about marketable models – what are they?

Marketable models are types of aircraft that are frequently flown and have a satisfactory order backlog – which is to say, aircraft that have been ordered but not yet delivered. The operator base is also important. If an aircraft type is ideal for a few airlines, but not for the majority of them, this of course reduces its marketability. Aircraft that are attractive to large numbers of operators around the world are marketable.

So the bread-and-butter aircraft is...

... a narrowbody.

Between 60-70% of the global fleet is made up of narrowbodies, these are aircraft for short-haul and medium-haul routes, and includes most of the aircraft in the Airbus A320 and Boeing 737 families. Of the remaining global fleet, 10% are regional aircraft, while 20-25% are widebodies or long-haul aircraft. This composition is not expected to change dramatically in future. What will change though is each individual aircraft, which will eventually be replaced by a new-model. Take the Airbus A320, for example, which was introduced in the late 1980s. The improved A320neo version was launched in 2016 and will be in service well into the next few decades. This is a very long product cycle, which gives the investor a marketable asset throughout this period.

So risk-averse investors want narrow-bodies then?

That is essentially the case, because the marketing risk is comparatively low. However, competition for these marketable assets is fierce. If an asset is not so popular, it is possible to mitigate the higher risk. The way to do this is by choosing the right operator, developing a sensible securities arrangement, and agreeing a long-term contract that covers most of the commercial lifespan of the aircraft.

Who is investing in long-haul aircraft?

The range of investors in widebodies is quite diverse. The smaller operator base for these, and potentially complex cabin modifications when switching operators, mean that the aircraft type must be selected with even more care. Widebodies with good marketing potential – generally comparatively small designs such as the Airbus A330 or the Boeing 787 – can represent a solid investment with a well-balanced risk-return profile.

What is the right size for an aircraft fund?

If I were investing in aircraft, I would go for a portfolio (i.e. different aircraft types and airlines) over a single investment every time. An investment volume of at least 200 million euros is required for a diversified strategy. That would get you four to five narrowbodies. The KGAL APF 1 currently includes 23 aircraft with a total value of around 800 million euros.

What does an aircraft fund offer the investor in contrast to other asset classes?

Long-term lease contracts allow the investor to enjoy steady returns over a long period. At the same time, it's an investment in a global market with impressive growth figures.

But isn't the aviation industry also subject to cyclical fluctuations?

In the short term there can be blips, like after 9/11, during the financial crisis or during the SARS pandemic – but the long term growth trend continues unabated. Cyclical fluctuations can also be mitigated with long term lease contracts with different termination dates.

What type of hedging is available – if airlines go bankrupt for example?

On the basis of the mobility of the assets, there is an excellent chance that the aircraft can also be effectively marketed in such an event. An aircraft used by an airline in Europe for example, can also be leased in Asia. This does not pose a problem if your investment is closely monitored by active asset management; the investor is less dependent on regional factors than the global market trend.

Operating lease

An operating lease is a contract which stipulates that the financial opportunities and risks of ownership lie with the lessor.

Part-out

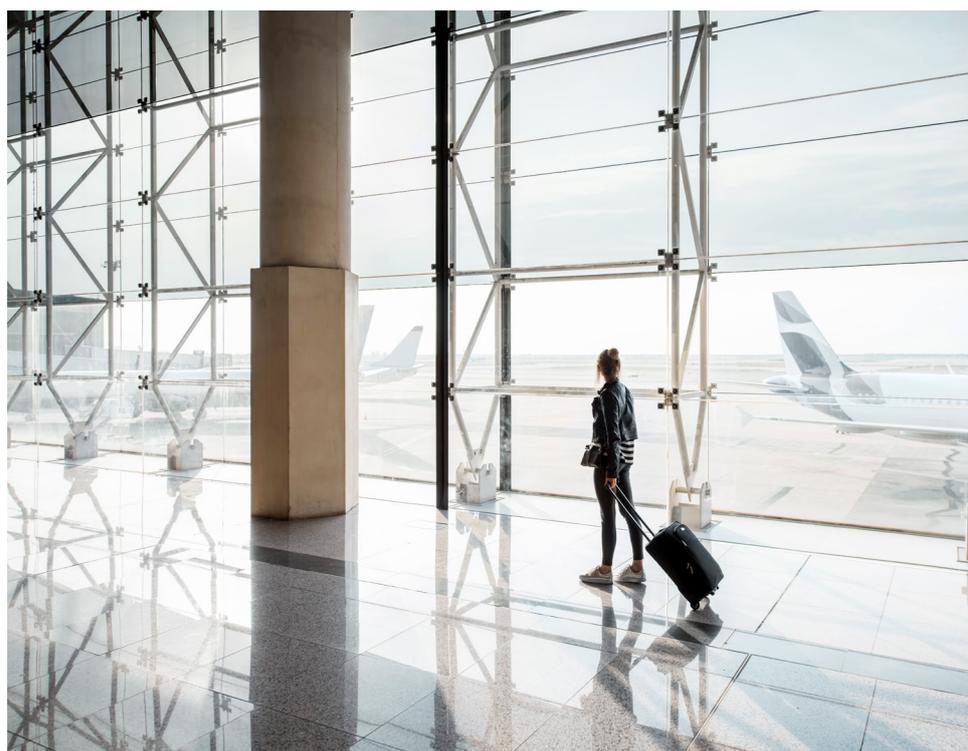
Part-out is the disassembly of an aircraft into its constituent parts, and the subsequent sale of these parts. Investors in a part-out model purchase an aircraft which has reached the end of its commercial lifespan, at the end of the lease term. It is often leased for just a short period and then disassembled as planned.

Regional aircraft

Regional aircraft normally have fewer than 100 seats. They are often used as commuter aircraft.

Widebody

A widebody is an aircraft with several centre aisles, and is normally used on long-haul routes.



Contact

Jochen Hörger

Aviation Asset Class Managing Director
KGAL Investment Management GmbH & Co. KG
Tölzer Straße 15, 82031 Grünwald
Germany
Email: jochen.hoerger@kgal.de

KGAL Group

To date, the aircraft fund investment volume realised by KGAL Group totals more than €7.4 billion. Since the initial aircraft fund in 1979, KGAL has concluded transactions for more than 800 aircraft, 81 private placements and other investment models, as well as 58 mutual and three institutional funds. KGAL Group is a leading, independent investment and asset manager with an investment volume of €22.7 billion. The investments focus on long-term capital investments for institutional investors in the real estate, infrastructure and aircraft asset classes.

Source information:

IATA Airline Industry Economic Performance June 2018:

<https://www.iata.org/publications/economics/Reports/Industry-Econ-Performance/IATA-Economic-Performance-of-the-Industry-mid-year-2018-report-final-v1.pdf>
<https://www.iata.org/publications/economics/Reports/Industry-Econ-Performance/Central-forecast-mid-year-2018-tables-v1.0.pdf>

U.S. Energy Information Administration (referring to the oil price graph):

https://www.eia.gov/dnav/pet/pet_pri_spt_s1_d.htm

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