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Aircraft as an Investment

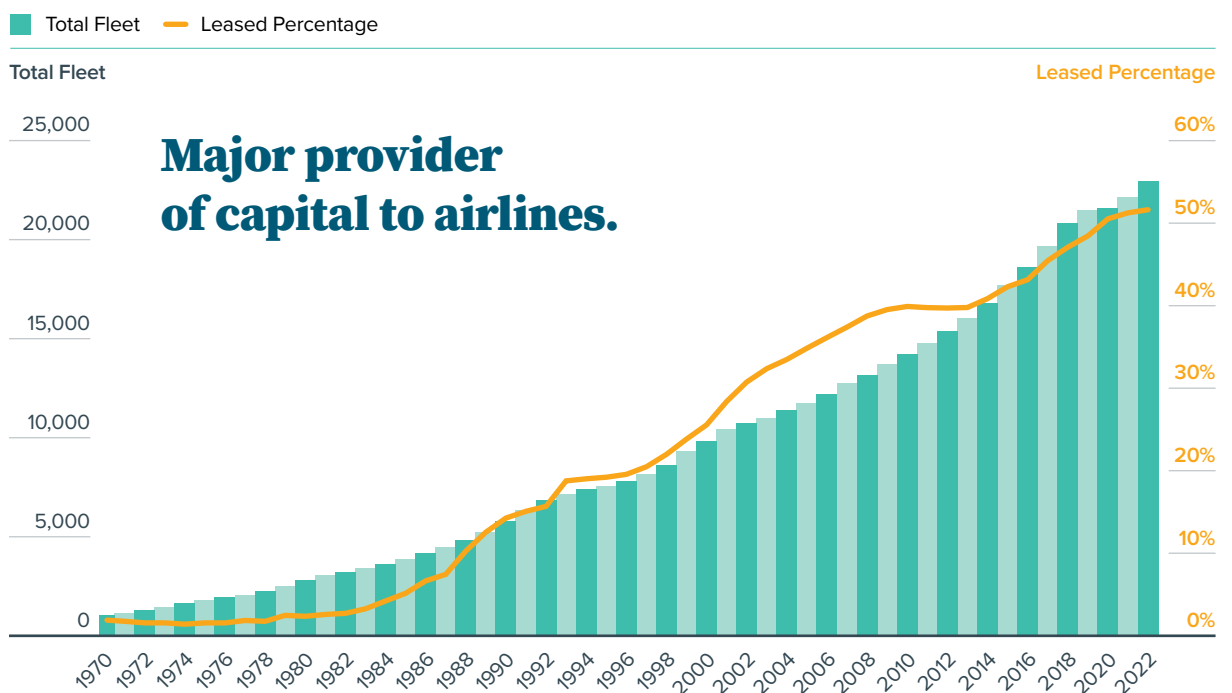
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Strategic and Market Analysis

Introduction

As the size of the leasing market has continued to grow, we have seen new institutional investors enter the market as primary aircraft owners. In this paper, we will examine some of the key liquidity issues that a new investor should consider when investing in aircraft. We will also compare aircraft returns to other asset classes that an institutional investor might own as part of a balanced portfolio. All analysis has focused on Western manufactured jets with a seat count above 100 seats.

Aircraft leasing has come a long way since the pioneering days of GPA (*Guinness Peat Aviation*) and ILFC (*International Lease Finance Corporation*) in the 1970s. The global fleet of commercial aircraft and the percentage of that fleet that is owned by aircraft lessors has grown considerably over the last four decades. Since 1980, the world fleet of commercial jet aircraft has grown at an annual rate of over 5%, and today stands at over 23,000 aircraft. About half of those aircraft are owned and managed by lessors - in 1990, this was just 10%. Aircraft are expensive assets to acquire and lessors have been a major provider of capital to airlines to fund their growth and expansion.

Figure 1: Leased fleet



Source: Cirium Fleets Analyzer

Why airlines lease

Table 1: Airline's benefits of leasing aircraft

Benefit to airline of leasing aircraft	Comment	Medium Term Outlook
Operational Flexibility	<ul style="list-style-type: none"> – Typical 5-12 year lease terms keep fleet planning options open – Keeps fleet young and at leading edge of technology 	Stable
Availability	<ul style="list-style-type: none"> – Allows airline to respond quickly to market forces – Lessors frequently offer earlier delivery slots than OEMs 	Positive
Funding	<ul style="list-style-type: none"> – Generally available even when debt markets are constrained – Potential to exceed 100% financing for some – May benefit from lessor's buying power – Often cheaper than airline's cost of funds 	Positive
Conserve cash	<ul style="list-style-type: none"> – Low level of advance payments required – 2-3 months security deposits – Keeping capital as a cushion and to develop business 	Positive
Weaker credit rating	<ul style="list-style-type: none"> – The asset is the primary risk, not the airline 	Stable
Manage asset exposure	<ul style="list-style-type: none"> – Lessors are more expert at taking residual risk than airlines – Airline can concentrate on the core business 	Positive
Cost-effective	<ul style="list-style-type: none"> – Net cash cost over term usually no more than for term financing – Demand driven by hard economics, not simply aircraft shortages 	Stable

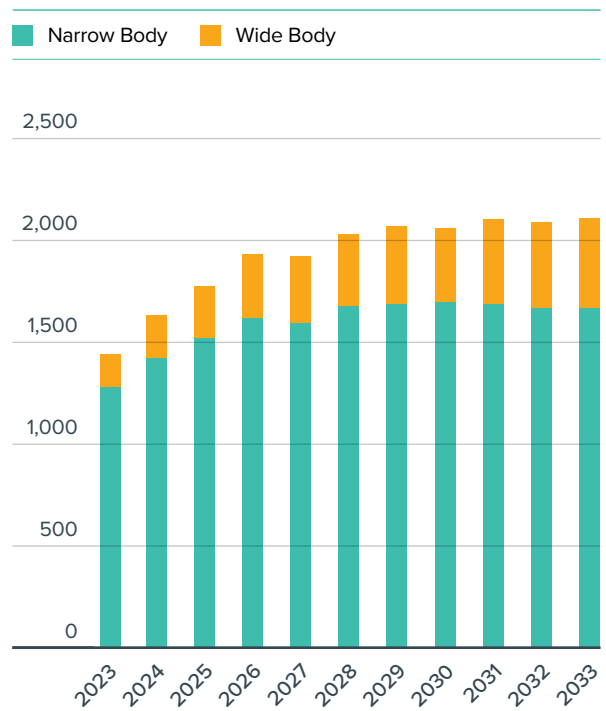
Airlines choose to lease aircraft for a variety of reasons. Accessing the capital to fund the purchase is one of the primary drivers. Much like renting or buying a property, it's often more affordable, especially for start-up airlines to lease an aircraft from a lessor than to purchase one outright from Airbus or Boeing, allowing them to focus their cash on the operation of the business. Aircraft are also typically available from the lessor sooner than going directly to the manufacturers and placing a new order, which could have a lead time of over 6 years. At the end of the lease term, the airline either returns the aircraft to the lessor or negotiates an extension. These factors give the airline far better operational and fleet flexibility, and leaves the residual value risk to be managed by the lessor.

We expect that these drivers are unlikely to change significantly in the future, meaning aircraft leasing will remain an important source of finance for the industry.

Demand for finance is expected to remain strong as manufacturer production levels increase and over the next 10 years, deliveries will average ~1,900 per year equivalent to an annual ~\$145bn financing requirement.

We would expect about 50% of this finance will be provided by lessors either via Sale-Leaseback (SLB) or from lessor order books.

Figure 2: Total deliveries (Units)



Source: SMBC Aviation Capital Fleet Forecast

What aircraft types get leased

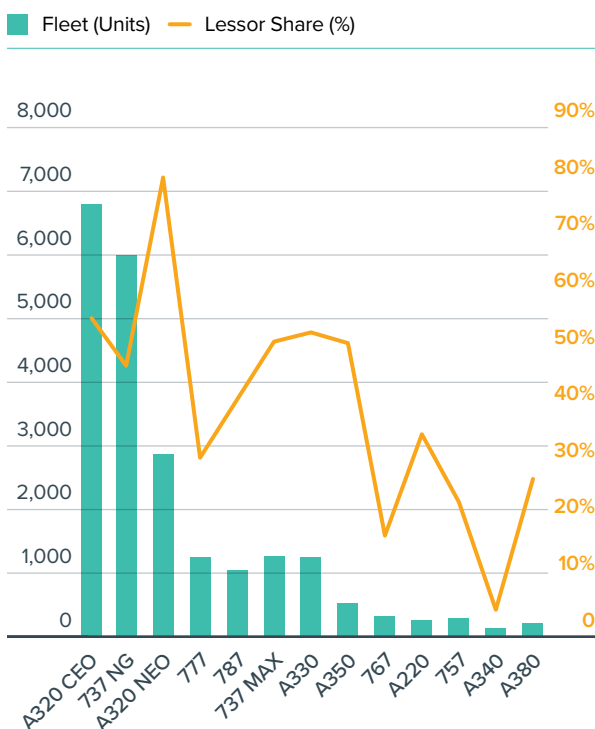
Some aircraft types prove to be more popular with the lessor community than others. In general, as can be seen in Figure 3, these have been narrowbody aircraft which have large fleets and deep operator bases.

Narrowbody aircraft are the workhorses of the industry and have much larger fleets and order backlogs than even the most popular widebody aircraft, which means more options for the lessor when it comes to finding a second lessee. This gives narrowbody aircraft a liquidity advantage, which mitigates re-lease, credit and residual value risk.

Engine options are also a consideration as airlines tend to prefer operating a single engine type. While the 737 family is exclusively powered by CFM, the A320 family has two engine options, CFM and P&W. The A330ceo has 3 engine suppliers which fragments the operator base further while its successor, the A330neo as well as the A350 has a sole engine supplier.

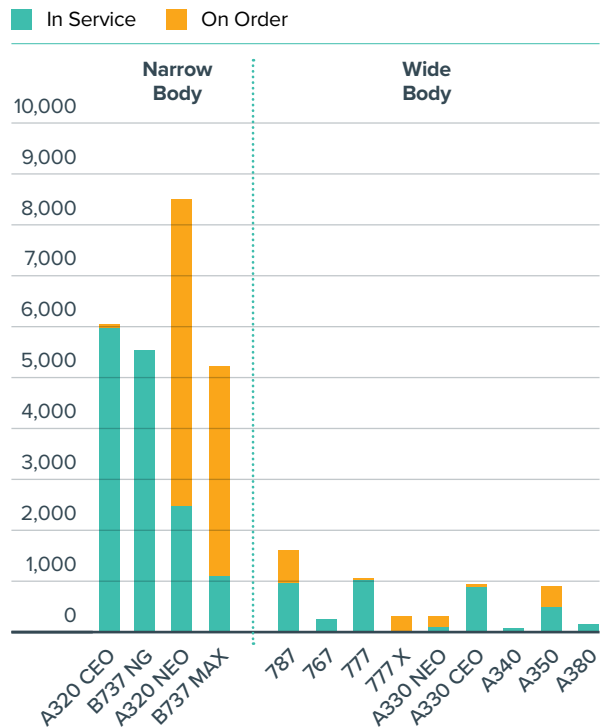
We strongly believe that high levels of asset liquidity are an absolute requirement for a new investor. This liquidity should not only be measured in terms of absolute fleet size (Figure 4) but also in terms of customer base (Figure 5).

Figure 3: Most popular lessor aircraft



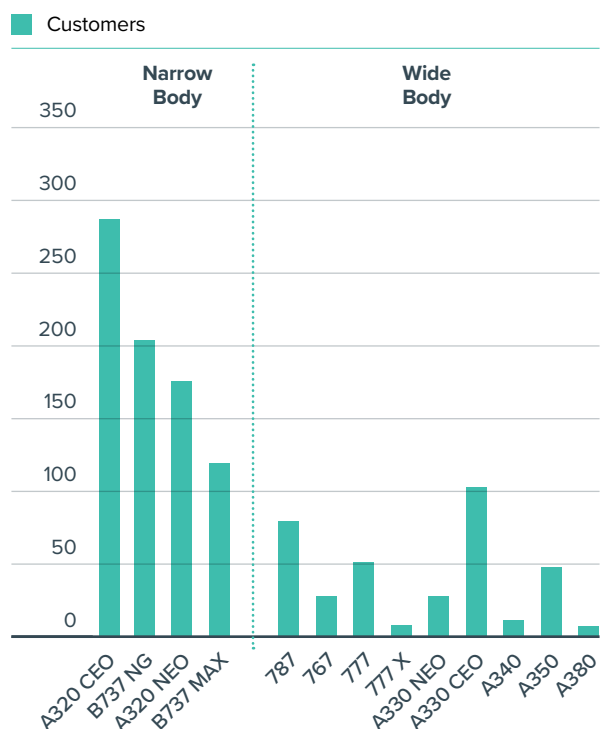
Source: Cirium Fleets Analyzer

Figure 4: Fleet size



Source: Cirium Fleets Analyzer

Figure 5: Customer base



Source: Cirium Fleets Analyzer

Longer lease terms

For the most part, lease terms for a first lease have been getting longer. Two decades ago, the average lease term of a 737-800 was around 9 years. Today, the average has increased to around 12 years. This is a positive for investors.

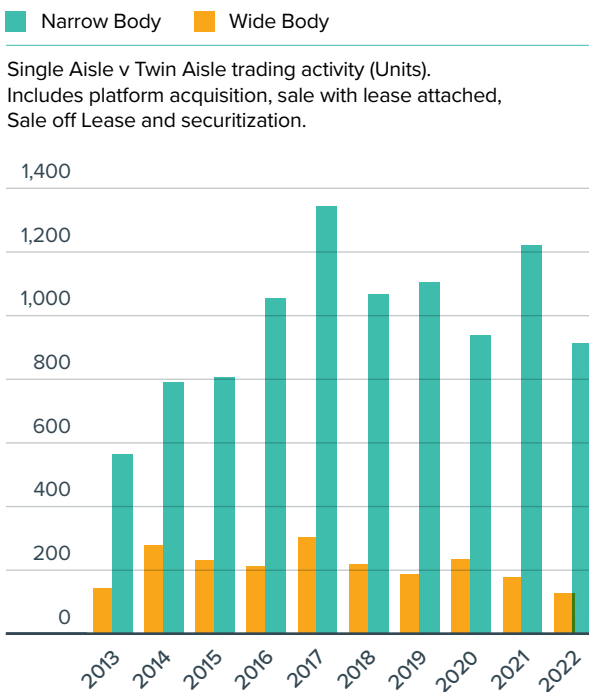
Although at least 1/3rd of leases are extended, this can vary considerably in any given year and can be very airline specific, with some airlines more likely to extend than others. That said, it's likely that a leased aircraft will be with its second operator by the age of 16.

Aircraft trading

On average around 12% of the global leased fleet trade in any given year. As figure 6 shows, narrowbody aircraft trade 5 times more often than widebody aircraft and account for the bulk of trading activity.

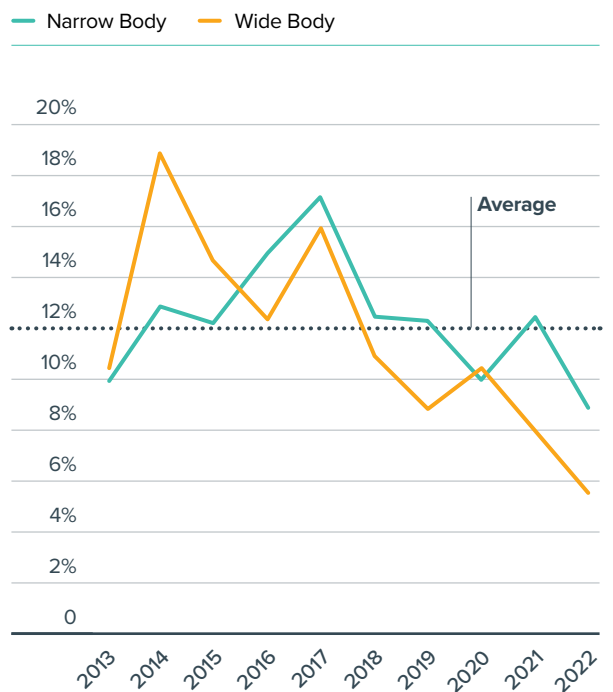
Although many more narrowbodies trade versus widebodies on a unit basis, as a percentage of their fleets the difference becomes less stark. However, the narrowbodies still trade more frequently, especially in the last three years.

Figure 6: Trading activity (Units)



Source: Cirium Fleets Analyzer

Figure 7: Trading activity (% of leased fleet)



Source: Cirium Fleets Analyzer; SMBC Aviation Capital Analysis

Aircraft returns

Unlike more traditional assets, there is currently no market standard benchmark index that measures aircraft returns. We have therefore examined historical market lease rates and valuation data from Cirium-Ascend back to 1980, to see which aircraft types have provided the best returns to investors and how investing in aircraft compares to alternative forms of investment.

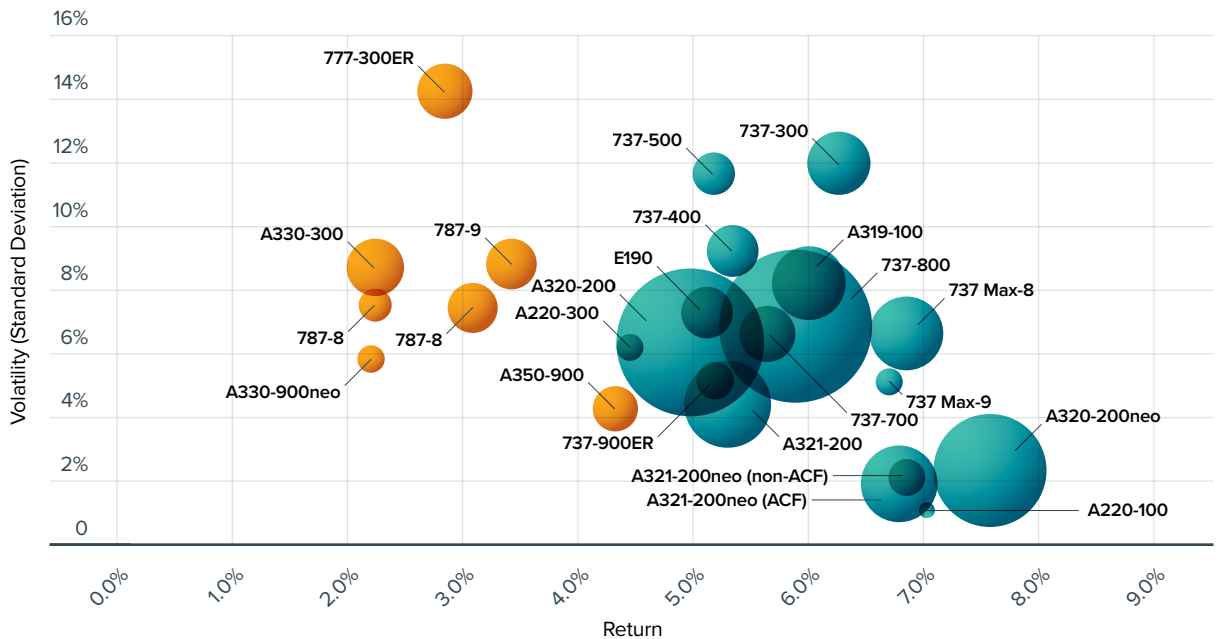
The methodology is relatively straight forward.

- We firstly identify all aircraft that are owned/managed by lessors for each given year.
- We then assume that all aircraft managed by lessors are purchased in that year.
- They are then held for one year, lease rents collected for one year and then sold the following year.
- As income is an important part of the calculation, lease income is earned only on the aircraft which are on lease at the start of the year.
- We have assumed full life market values for the purchase and sale which captures year on year maintenance value inflation.
- We have looked at measuring the risk/volatility of these returns using standard deviation.

Figure 8: Asset Returns and Volatility

Increased risk and/or lower returns as aircraft age

Please Note: The size of the bubble relates to the in-service fleet size



Source: SMBC Aviation Capital Analysis of Ascend Values

Aircraft returns (continued)

The analysis, which is summarised in Figures 8 through 10, shows that narrowbody aircraft provided better returns with less volatility than widebodies. New tech widebody aircraft were returning c.5% on average pre-Covid and have begun to recover following a two-year slump, we expect that recovery to continue in the short-term.

Widebody aircraft operators have a greater proportion of higher credit grade network carriers than narrowbody operators, which may offer lower returns but also lower risk. Investment risk can be mitigated by disciplined credit focus and a diversified portfolio which includes widebody aircraft.

In addition, we can see in Figure 9 that the blue coloured younger aircraft provided superior returns and / or volatility to the older golden aircraft.

While we fully recognise that, in reality, aircraft are not leased for one year, the benefit of this methodology is that it allows us to track the returns for every year up to 2023. As returns are realized when the aircraft is sold, a longer lease term results in an absence of data for the most recent years. However, we have also run a sample dataset on select asset types over five-year terms. The results were broadly comparable in terms of return, but with a not surprising lower volatility.

The reason for higher volatility with the one-year term is that you are generally buying/renting/selling during the same stage of the asset value cycle. With a five-year term, for example, you may purchase and rent the aircraft on a downcycle but five years later you may sell in the upcycle.

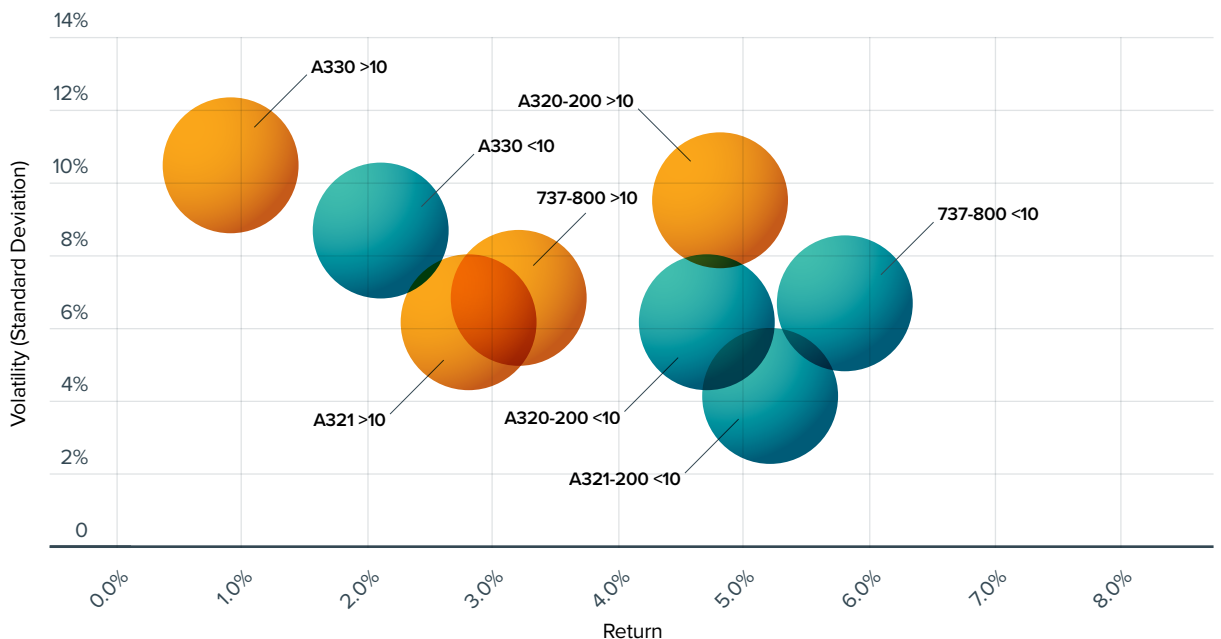
Using the 2023 numbers from the same dataset, we ran some IRR calculations to see how they would compare. New tech narrowbodies average 7%, versus 5.5% on new tech widebodies. Current tech narrowbodies averaged 6%, versus 7.5% on current tech widebodies.

Aircraft have proven to be an attractive asset for investment for a number of reasons.

- They are a hard asset, resilient to inflation, with long economic lives and are typically denominated in US\$.
- They are mobile assets with steady predictable lease cash flows.
- Unlike property, the secondary lease can be in a completely different jurisdiction allowing the owner to better track global rather than local supply and demand patterns.
- They are also liquid; on average an aircraft will trade between two and three times over the course of its lifetime.

Figure 9: Asset Returns and Volatility by Age

Increased risk and/or lower returns as aircraft age



Source: SMBC Aviation Capital Analysis of Ascend Values

Aircraft returns (continued)

For these reasons, aircraft ownership provides a competitive risk / reward combination relative to other major asset classes (Figure 10), and thus has the potential to play a useful role in wider portfolio diversification, also given low correlations with equities, real estate and treasury bonds (Table 2).

Investors also need to consider whether they want to manage the assets themselves or hire a specialist asset manager to monitor the credit and technical risks of the portfolio and manage the remarketing and trading of aircraft.

We would note that for an investor with a small fleet it is optimum to engage the services of an asset manager rather than to invest directly in establishing a platform themselves.

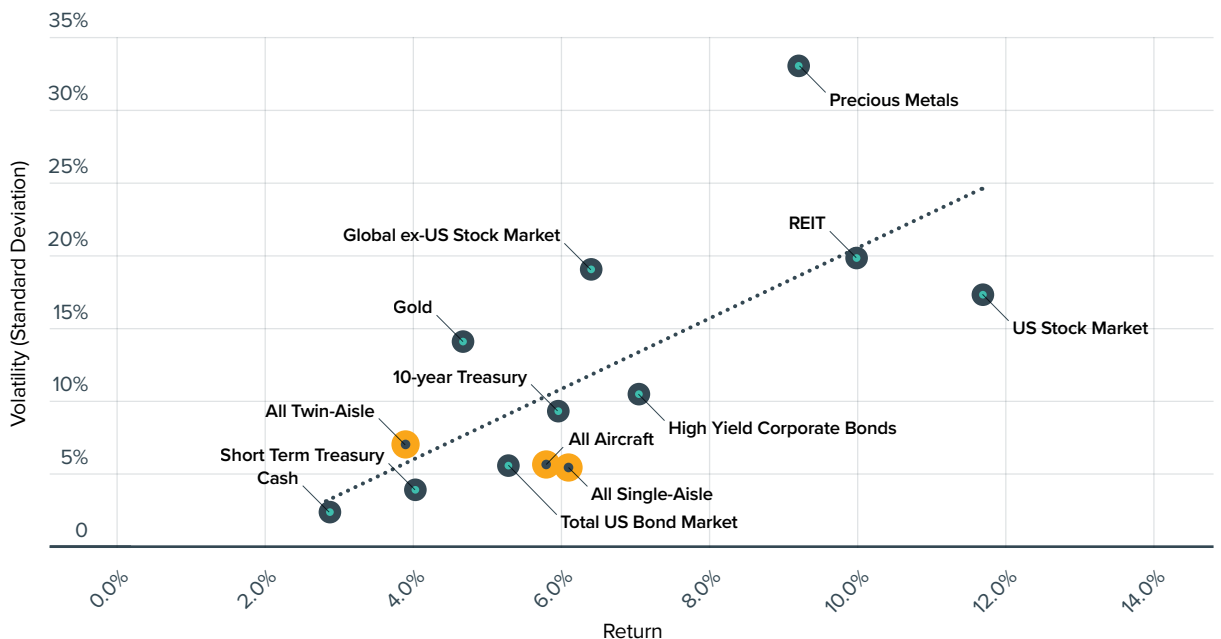
Table 2: Investment Correlations

	All Aircraft	All Single Aisle	All Twin Aisle	US Stock Market	10-year Treasury	High Yield Corp. Bonds	IATA Airline Margin	REIT
All Aircraft	1.00	0.97	0.88	0.29	-0.16	0.16	0.59	0.25
All Single Aisle	0.97	1.00	0.74	0.33	-0.16	0.09	0.49	0.30
All Twin Aisle	0.88	0.74	1.00	0.11	-0.29	0.22	0.66	0.12
US Stock Market	0.29	0.33	0.11	1.00	-0.16	0.74	-0.07	0.54
10-year Treasury	-0.16	-0.16	-0.29	-0.16	1.00	-0.29	-0.19	-0.05
High Yield Corp. Bonds	0.16	0.09	0.22	0.74	-0.29	1.00	0.11	0.74
IATA Airline Margin	0.59	0.49	0.66	-0.07	-0.19	0.11	1.00	0.09
REIT	0.25	0.30	0.12	0.54	-0.05	0.74	0.09	1.00

Source: Portfolio Visualizer

Figure 10: Comparison with other asset classes

Comparable Investment Risk Vs Return



Source: SMBC Aviation Capital Analysis of Ascend Values & Portfolio Visualizer

Conclusion

- Outlook for leasing remains robust and opportunities to invest are good
- Leasing will remain attractive to airlines for a variety of reasons and will maintain its 50% share
- Demand for finance is expected to remain strong as manufacturer production levels increase over the next 10 years. Deliveries will average ~1,900 per year equivalent to an annual ~\$145bn financing requirement.
- Lease terms have increased over the last two decades and now stand at around 12 years for the initial lease resulting in longer more predictable lease cash flows
- Narrowbody aircraft offer a liquidity advantage over widebody aircraft mitigating re-lease, credit and residual value risk.
- Narrowbody aircraft also provided better returns with less volatility than widebodies, although new tech widebody aircraft continue to recover. In addition, younger aircraft provided superior returns and / or volatility.
- Denominated in US\$, aircraft as an investment class are mobile assets allowing the owner to track global supply and demand patterns. Aircraft are liquid hard assets which on average will trade between 2 and 3 times over the course of its lifetime
- Aircraft ownership provides a competitive risk / reward combination relative to other major asset classes and thus has the potential to play a useful role in wider portfolio diversification given low correlations with equities, real estate and treasury bonds.

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Glossary

Current Market Value

The International Society of Transport Aircraft Trading (ISTAT) defines “Market Value” as follows: Market Value or Fair Market Value (or Current Market Value or Current Fair Market Value, if the value pertains to the time of the analysis) is the Appraiser’s opinion of the most likely trading price that may be generated for an aircraft (or other aviation-related asset) under the market circumstances perceived to exist at the time in question.

Current Market Lease Rate

This relates to an operating lease rate, this is specifically a “net dry operating lease” rate. The lease of an aircraft whereby the lessor takes all of the risks and rewards of ownership, and the lessee takes all of the risks and rewards of operation.

Full-Life

The term “full-life” assumes that the airframe, engines, (propellers, blades, gearboxes where relevant) landing gear, APU (Auxiliary Power Unit) and all major components are either new or have just undergone a major overhaul, inspection or performance restoration as appropriate; with engine LLPs (Life Limited Parts) having 100% of their certified lives remaining.

Operating Lease

From a financial reporting perspective, a lease that has the characteristics of a usage agreement and also meets certain criteria established by the FASB. Such a lease is not required to be shown on the balance sheet of the lessee. The term also is used to refer to leases in which the lessor has taken a significant residual position in the lease pricing and- therefore- must salvage the equipment for a certain value at the end of the lease term in order to earn its rate of return.

Original Equipment Manufacturer (OEM)

Companies involved with the design, manufacture and assembly of aircraft e.g. Boeing, Airbus, CFM, P&W and Honeywell.

Return

For this particular analysis, Return is the yield on a percentage basis from purchasing an aircraft at Current Market Value, earning rent for one year at the Current Market Lease Rate and selling at year end for the then Current Market Value.

Sale-Lease Back

A transaction that involves the sale of equipment to a leasing company and a subsequent lease of the same equipment back to the original owner who continues to use the equipment.

Volatility

Volatility is measured by calculating the standard deviation of the annualized returns over the time period from entry-to-service of the asset type until 2023.

About the authors

Shane Matthews

Shane is Head of the Strategic and Market Analysis Team leading a team of six analysts who have responsibility for SMBC Aviation Capital's proprietary models, databases and market analysis. He joined the company in 2005 as a credit risk analyst covering customers in Asia Pacific. Shane spent 10 years as an equity analyst covering airlines with NCB Stockbrokers and HSBC Securities in Singapore. He holds a Bachelor of Commerce Degree and a Masters in Business Studies in Banking and Finance from University College Dublin.

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Darren joined SMBC Aviation Capital in 2004 as a Residual Value Risk Analyst before joining the credit risk team covering airlines in Europe and North Africa. In 2014 he joined the Strategic and Market Analysis team with responsibility for industry analysis, forecasting and portfolio risk management. Prior to joining SMBC Aviation Capital, Darren worked in the semiconductor industry and has an Engineering Degree and an MBA from Trinity College Dublin.

David Griffin

David is VP Strategic and Market Analysis. He initially joined SMBC Aviation Capital in 2021 as a member of the Commercial Analysis team, with responsibility for assessment and evaluation of all company transactions including asset acquisitions, placements and trading before joining the SMA team in March 2023. Prior to joining SMBC Aviation Capital, David was a Valuation Consultant with Ascend by Cirium. David holds a Bachelor's Degree in Aeronautical Engineering and a Master's in Business Management, both from the University of Limerick. He is also an ISTAT Certified Appraiser.

Queries

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