

AIRCRAFT AND ENGINES DAY

18TH ANNUAL GLOBAL
AIRFINANCE CONFERENCE **DUBLIN 2016**

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What is an Ideal Aircraft Asset



A SUBSIDIARY OF: Mitsubishi UFJ Lease & Finance

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What is an Ideal Aircraft Asset

Agenda:

- I. Characteristic of an Ideal Aircraft Asset
- II. Aircraft Residual Value Retention Factors
- III. Value Cycles & When to Invest



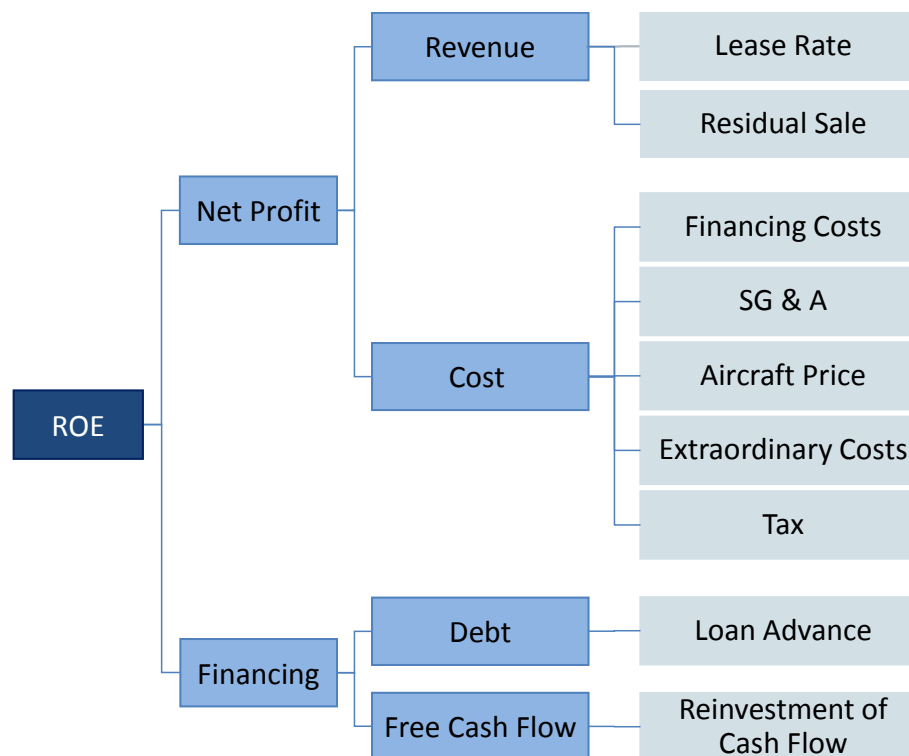
Characteristics of an Ideal Aircraft Asset

From an investor perspective, an ideal aircraft is one where:

- ✓ The aircraft has robust market liquidity owing to:
 - competitive market share,
 - large customer & lessor base, and
 - robust geographical spread
- ✓ The aircraft is **easily financeable** and **cost effectively** transferred from one operator to another in an active, liquid and global market
- ✓ The value of the aircraft does not decline substantially given a key component of the overall economic return is the **residual value**.

Residual Value Retention Factors

Components of overall economic return – investor perspective



The **residual value** is a key component of an investor's overall economic return. If residual values do not meet projections :

- the net present value of the transaction can be diminished
- equity investors can potentially lose a portion of their investment

Residual Value Retention Factors

Most of the inputs to overall economic return are **determinative**.

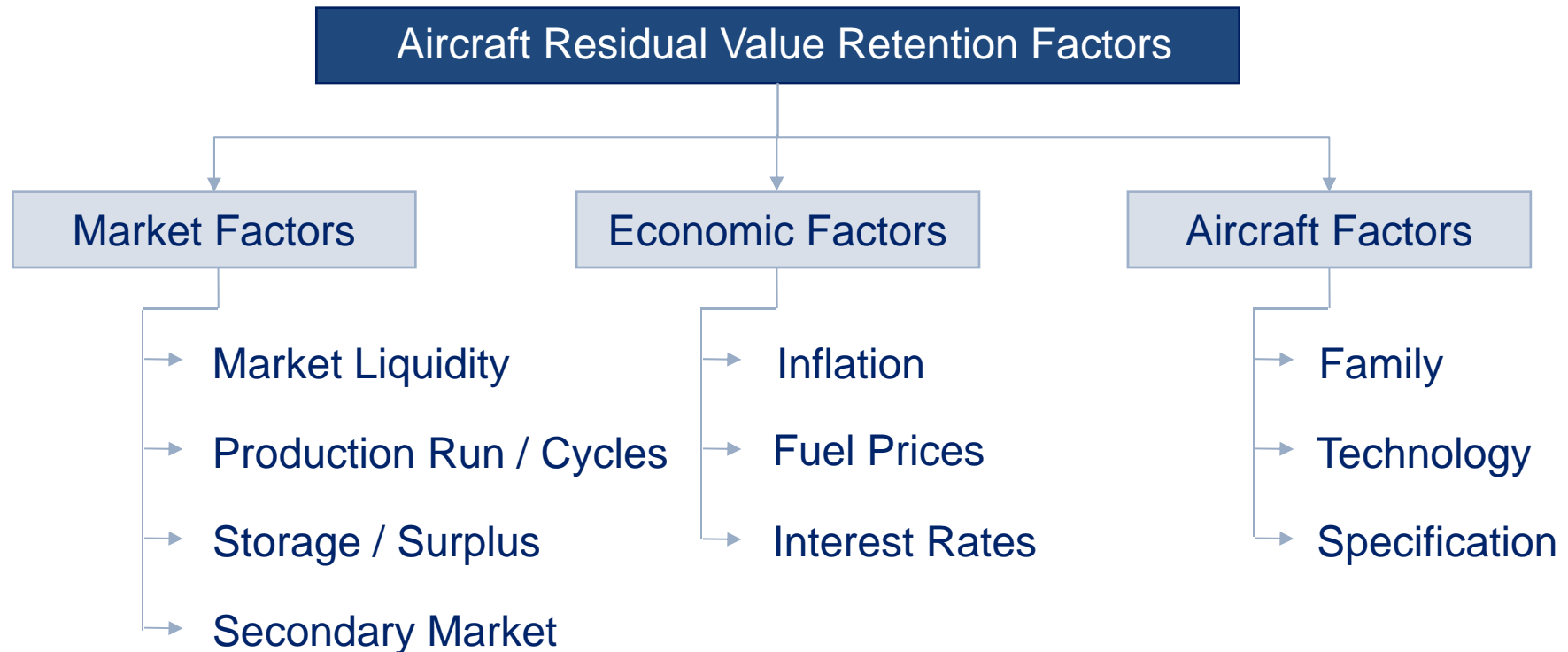
However :

this does not apply to **residual values** - future residual values are forecasted and subject to variability, uncertainty & **RISK**.

But we can mitigate this RISK by :

forming a policy to analyze those **factors that influence an aircraft's residual value over time**.

Residual Value Retention Factors



Residual Value Retention - Market Factors

Market Liquidity is composed of an aircraft's: A.) **Order Book**, and B.) **Market Penetration**.

- ✓ Market liquidity represents one of the largest influences on value retention.

A. Order Book reflects the number of **firm orders** broken down by : a.) firm backlog, and b.) deliveries.

- ✓ Order book serves to highlight the **market share** an aircraft has achieved

B. Market Penetration consists of the **number of customers & lessors**, and their associated **geographical distribution**

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Residual Value Retention - Market Factors

Example : 737-800 Market Liquidity

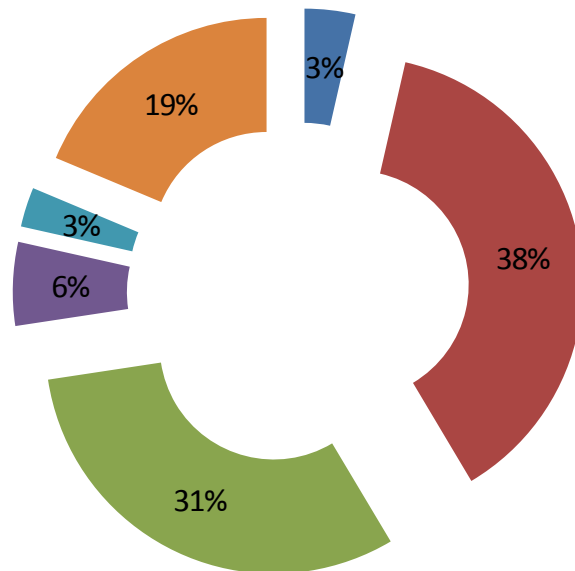
Firm Orders
4,891

Deliveries
3,799

Firm Backlog
1,092

Customers
150 +

Lessors
40 +



Region	Fleet
Africa	153
Asia Pacific	1,236
Europe	1,088
Latin America	275
Middle East	113
North America	886

Source: Ascend as Jul-2015

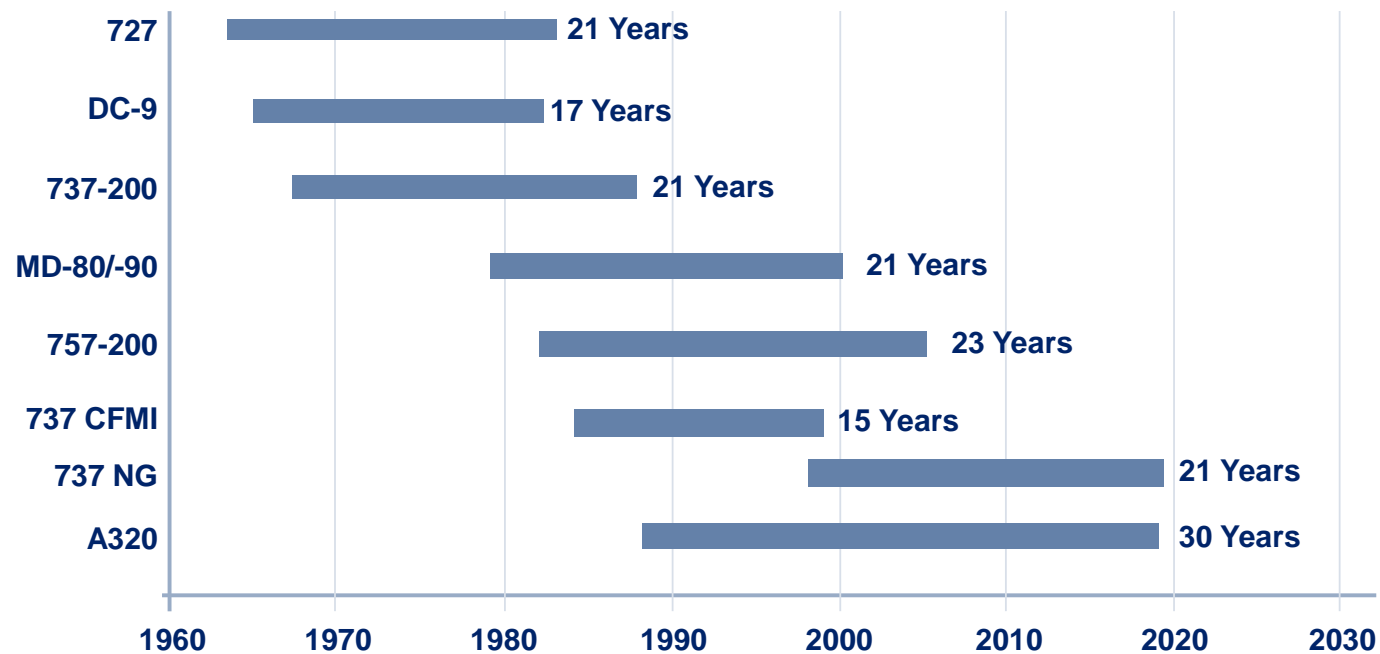
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Residual Value Retention - Market Factors

Aircraft with **long production runs** have greater value retention compared with shorter product life cycles.



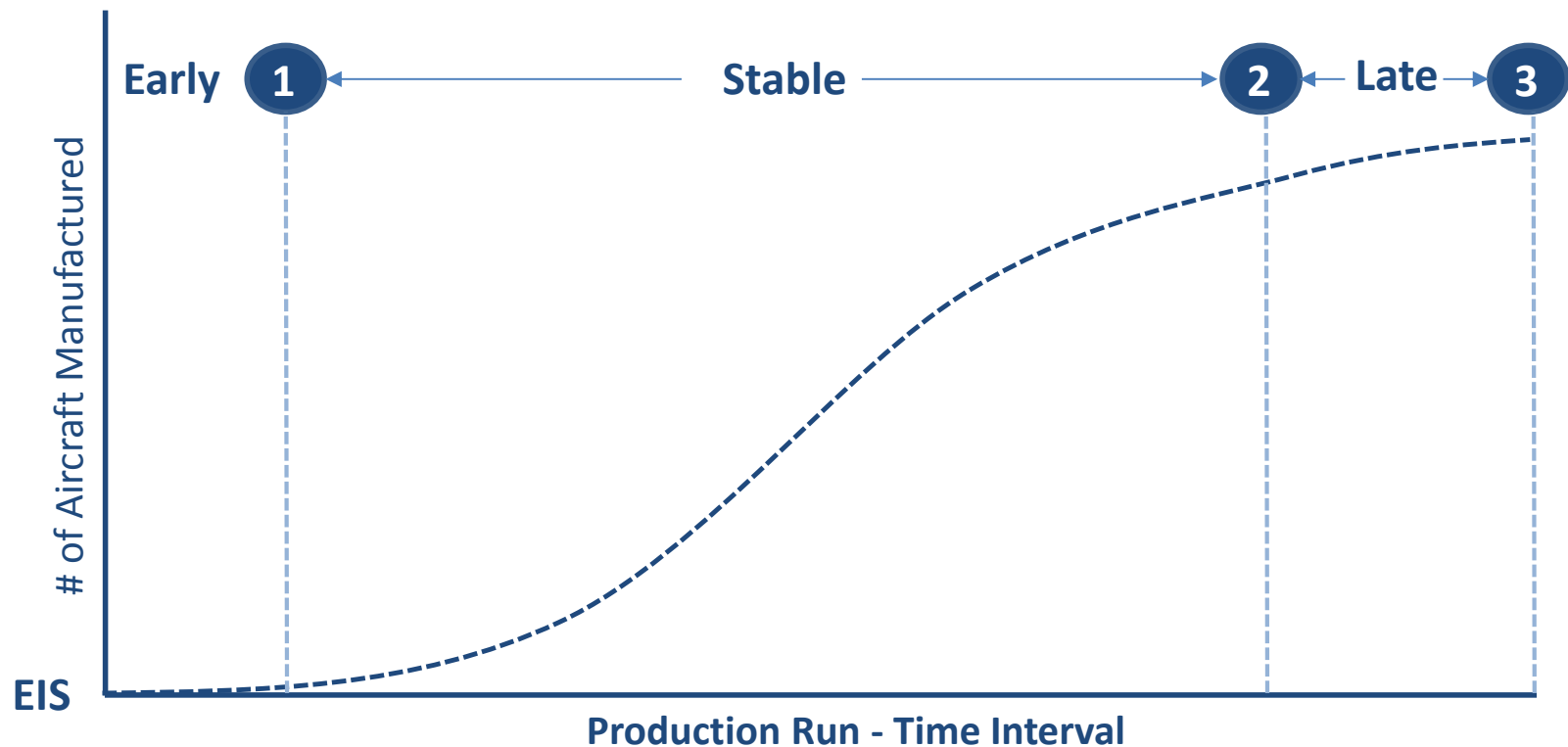
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Residual Value Retention - Market Factors

Aircraft's position in the **production cycle** influences value retention



Residual Value Retention - Market Factors

Key Observations:

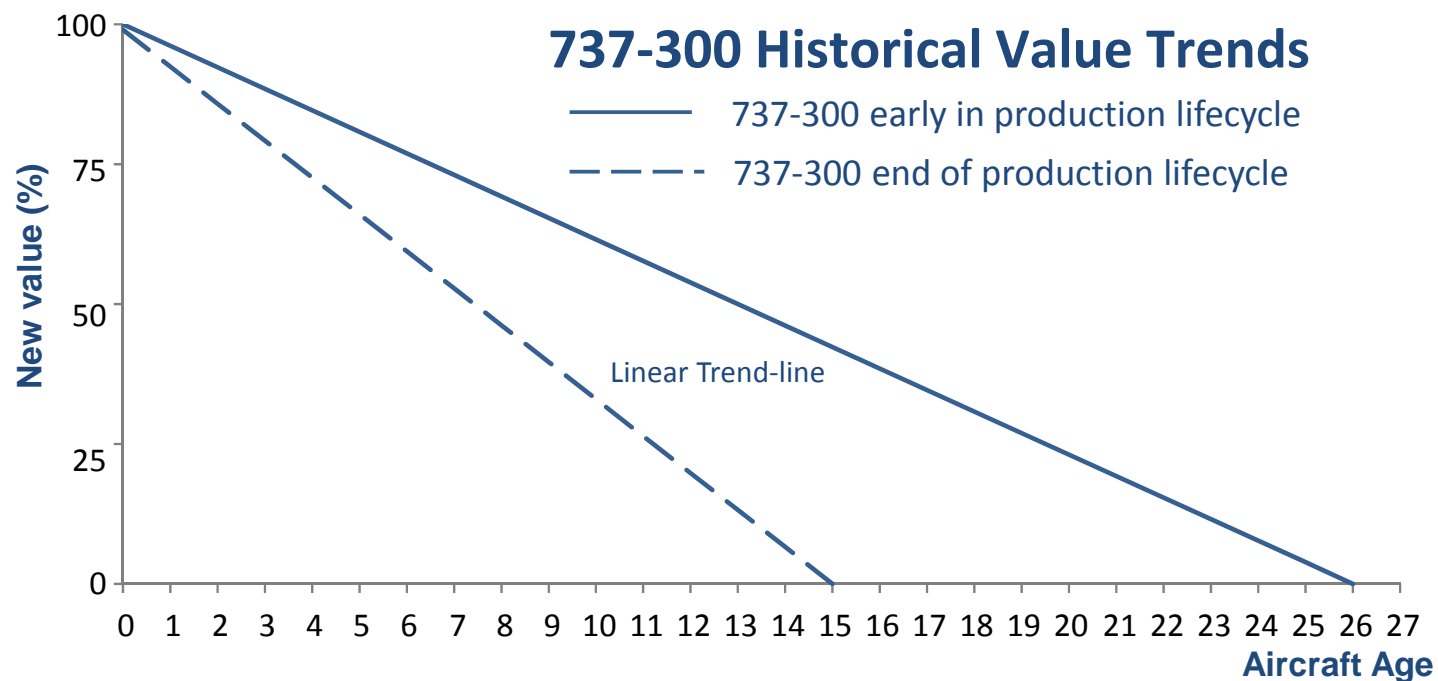
Early production units can experience value volatility as they tend to be heavier, have lower operating weights & incur higher operating costs. **However**, these units are often the beneficiary of competitive OEM pricing.

Stabilized production units tend to have production issues resolved and thus experience stable declines in values

Late production units often experience higher declines in values given they are competing against newer technology units offering improvements in operating efficiency. **However**, these units are often the beneficiary of competitive OEM pricing.

Residual Value Retention - Market Factors

Aircraft built at the **end of production lifecycle** depreciate more quickly than earlier vintages, and are often **heavily discounted**.



Residual Value Retention - Market Factors

Other Production Observations:

During an aircraft's production run it's important to track **conversions rights** (e.g. A320 to A321) as this serves as a barometer to future guidance

An aircraft's **production rate** is a leading determinant of capacity growth, with impact on market penetration.

- ✓ Investors tend to have concerns over high production rates, which they view as creating an oversupply leading to volatility in lease rates & values.

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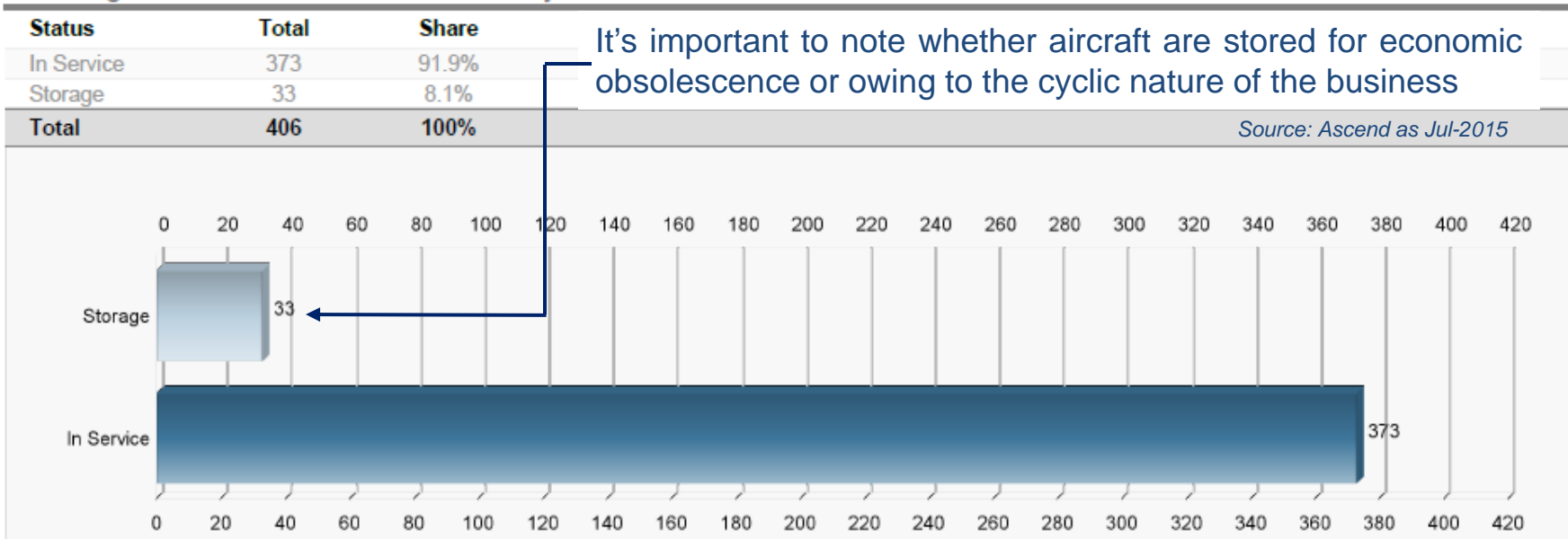


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Residual Value Retention - Market Factors

The number of **stored aircraft** is often used as an indicator of aircraft surpluses; in valuation terms, surpluses push values down.

Boeing 777-200ER Order Book Fleet by Aircraft Status



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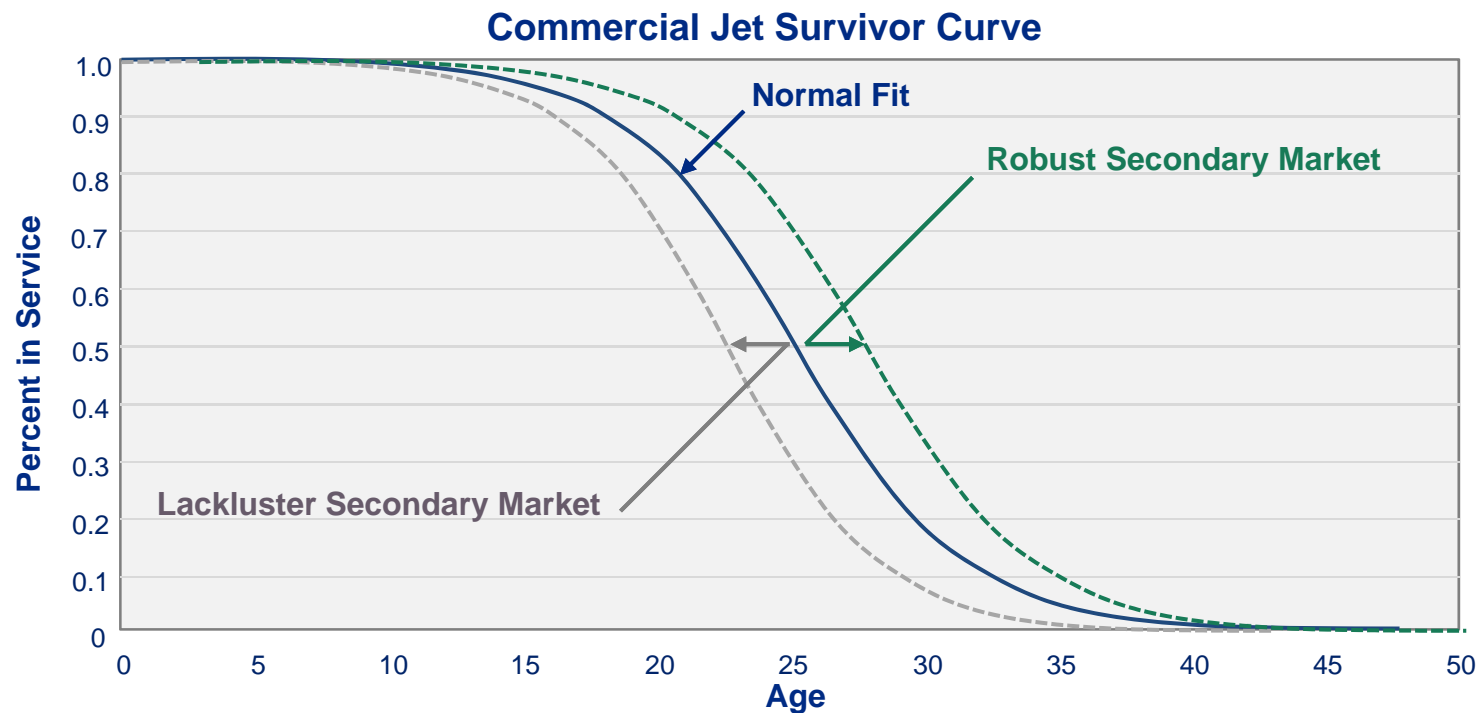
Residual Value Retention - **Market Factors**

There are several viable **secondary markets** that exist for older aircraft, key among them:

- ✓ Lease to second and/or third tier operators
- ✓ Passenger-to-freighter conversion, and
- ✓ Part out for engine and other rotatable components

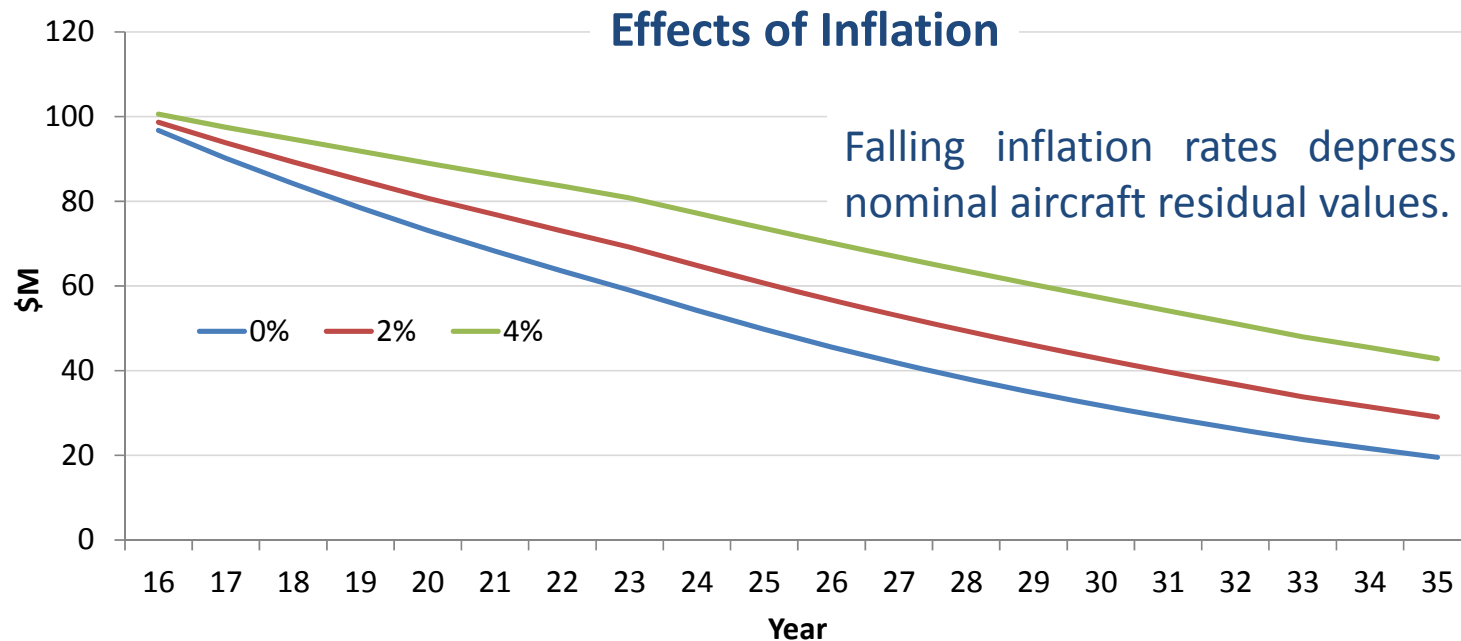
Residual Value Retention - Market Factors

Secondary market influence on aircraft economic lives



Residual Value Retention - Economic Factors

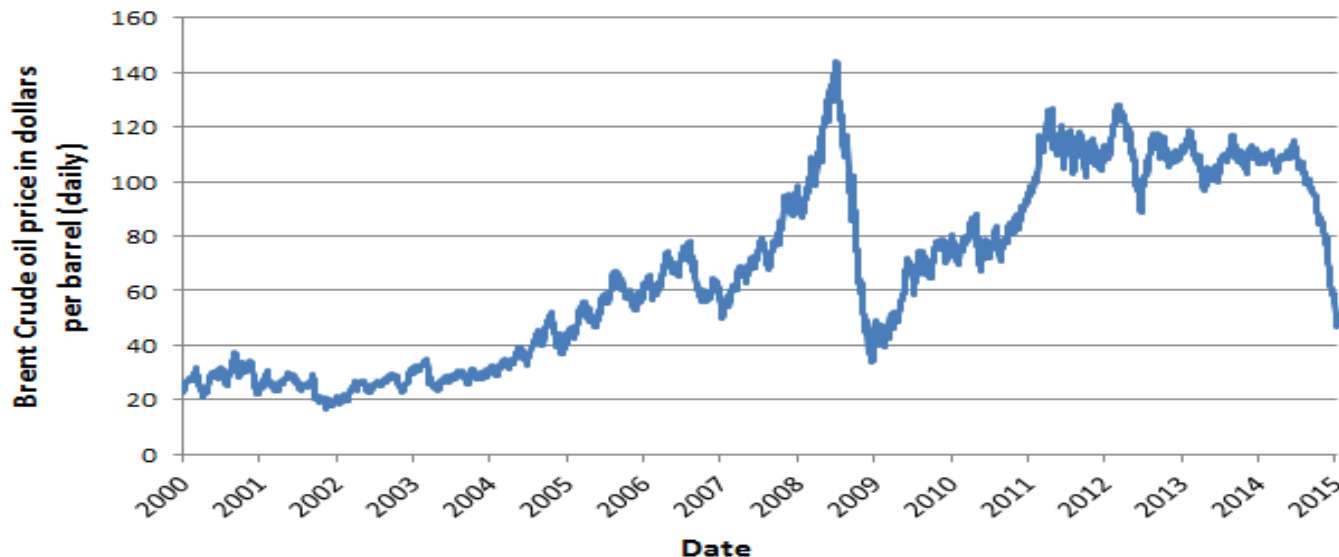
The **role of inflation** should also be considered by aircraft investors. The residual value of an aircraft is a function of “real” future asset value and the rate of inflation over the given period.



Residual Value Retention - Economic Factors

Fuel prices are now an added layer of complexity to aircraft residual values.

- ✓ Sustained low fuel prices, all else equal, are likely to support demand for older aircraft at the expense of certain newer types.



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Residual Value Retention - Aircraft Factors

Aircraft are offered with **optional features** such as engine models, operating weights, avionics, winglets, brakes, & interior layouts.

Options with the greatest influences on aircraft values consist of:

- ✓ Engines & Thrust Options,
- ✓ Operating Weights, Winglets,
- ✓ Cabin Layout & Crew Rest Area

Aircraft equipped with **generic & higher specification** features tend to retain their values better & are more marketable relative to those with unique features.

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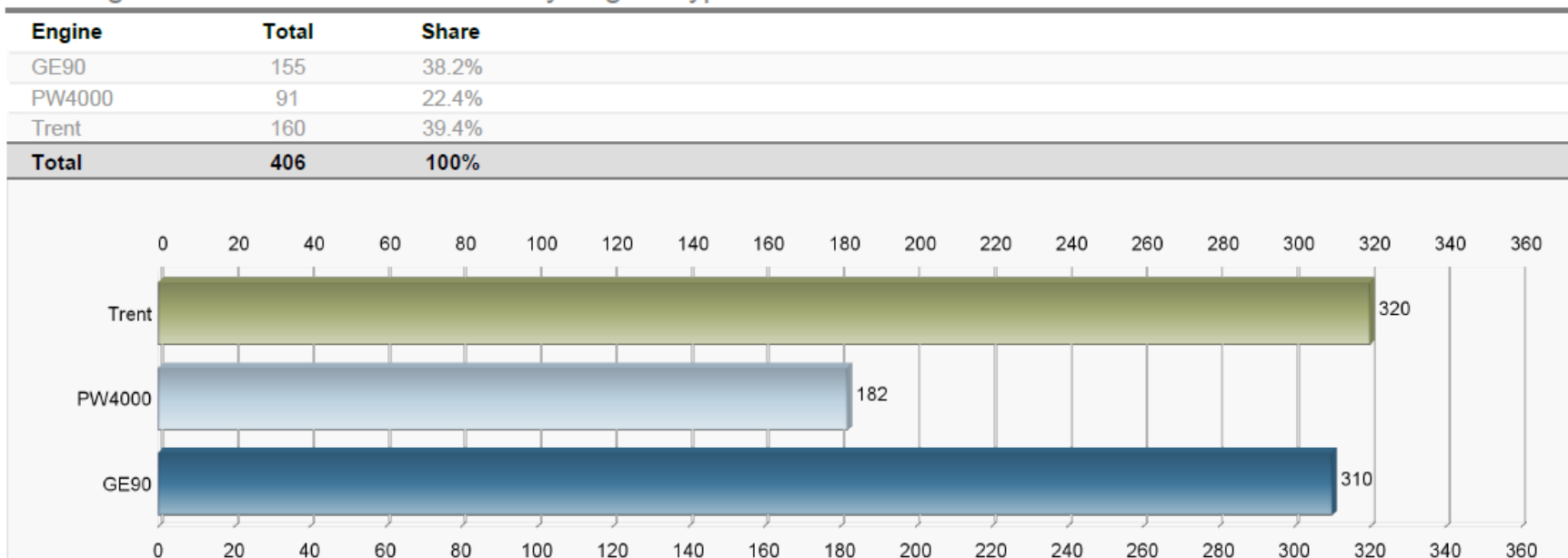


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Residual Value Retention - Aircraft Factors

Fragmentation among multiple engine manufacturers tends to make remarketing more difficult (Example 777-200ER)

Boeing 777-200ER Order Book Fleet by Engine Types



Residual Value Retention - Aircraft Factors

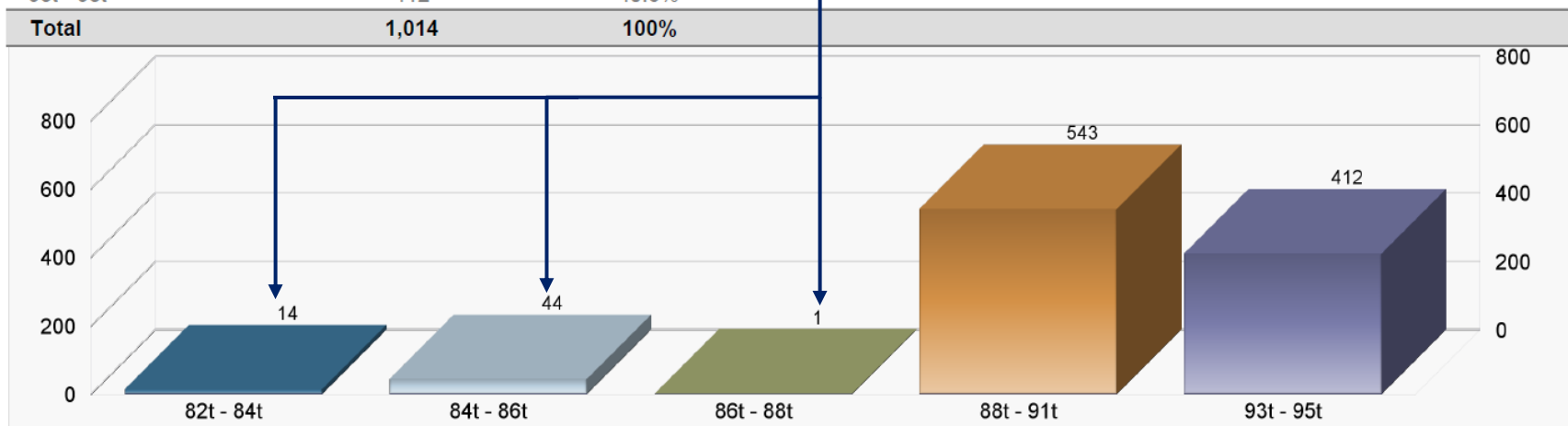
Higher operating weights – particularly **MTOW** - enhance an aircraft's utility and marketability (Example A321-200)

Airbus A321-200 (5B/A5) In Service Fleet by Aircraft MTOWs

MTOW (tons)	Total	Share
82t - 84t	14	1.4%
84t - 86t	44	4.3%
86t - 88t	1	0.1%
88t - 91t	543	53.6%
93t - 95t	412	40.6%
Total	1,014	100%

Lower MTOW models are generally unpopular, and require costly weight upgrades to convert them to higher standards.

Source: Ascend as Jul-2015

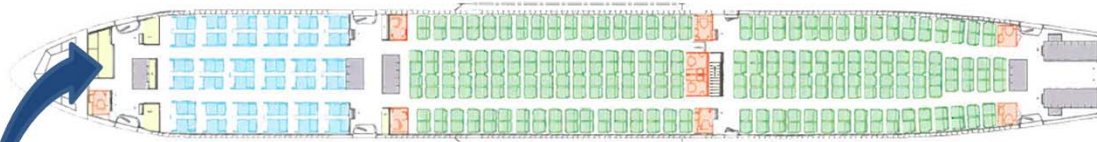


Residual Value Retention - Aircraft Factors

Standard configurations are easier to lease, and have higher resale value. The rule for cabin specification is **“generic is good, and unique is bad”**.

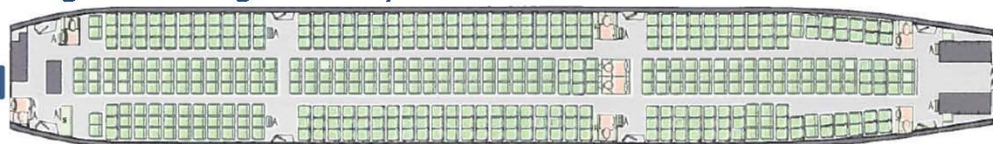
A330-300

Two-class basic : 300 seats



Transition cost from high-density to basic two-class : \$8M-\$12M

Single-class high density : 440 seats



Changes in cabin configuration can be an expensive proposition, often requiring many man-hours of work, several weeks or months of down-time, and expensive cabin hardware.

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Residual Value Retention - Aircraft Factors

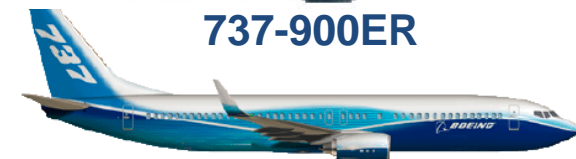
Customers operating a **family of aircraft** such as the A320 & 737NG incur lower investment in parts, equipment, & training.

737NG Family

- 100% Engine commonality
- 100% Flight deck commonality
- Common ground support equip
- Common ground handling
- 98%-100% common airframe spares



737-900ER



737-800



737-700

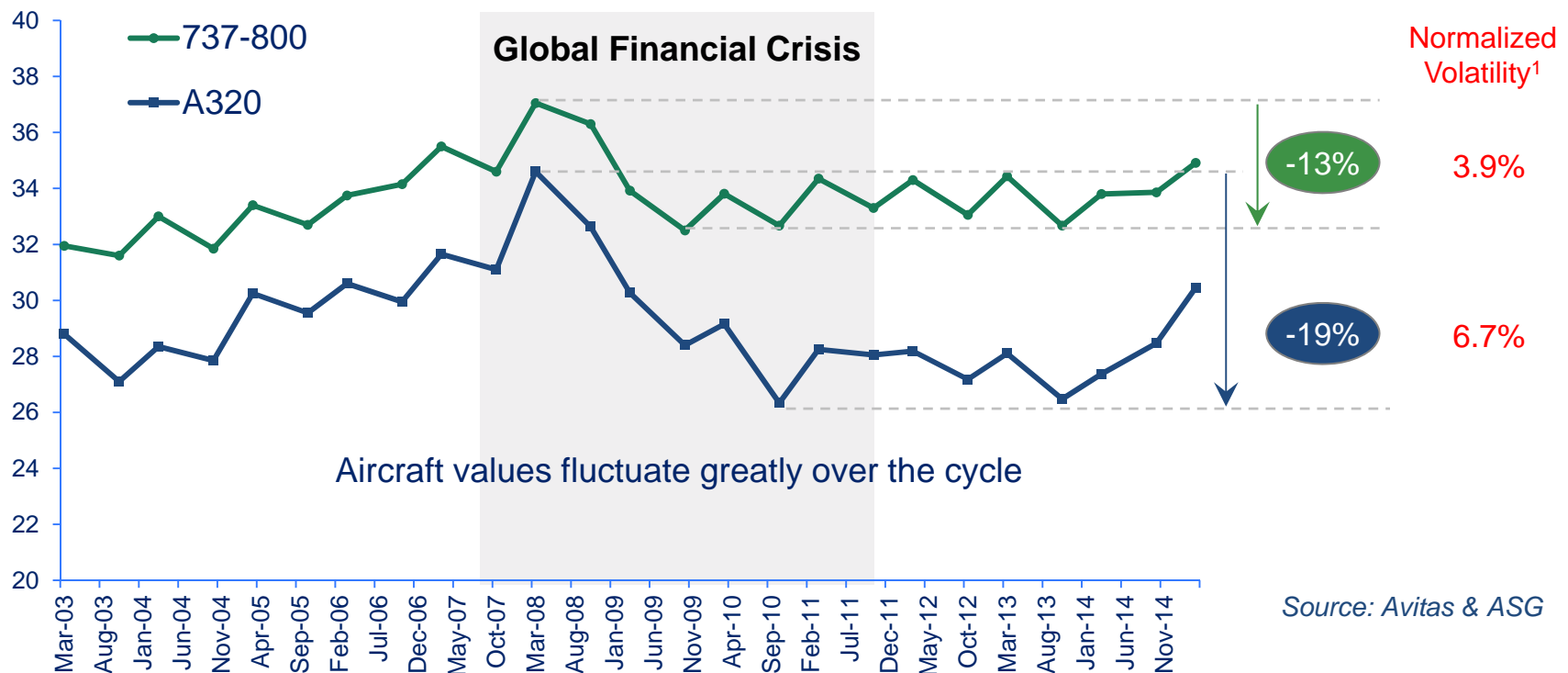
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Aircraft Value Cycles & When to Invest

Constant age historical half-life CMVs for 5-yr Old 737-800 & A320



1. Normalized Volatility measure given by standard deviation divided by the mean (given in %)

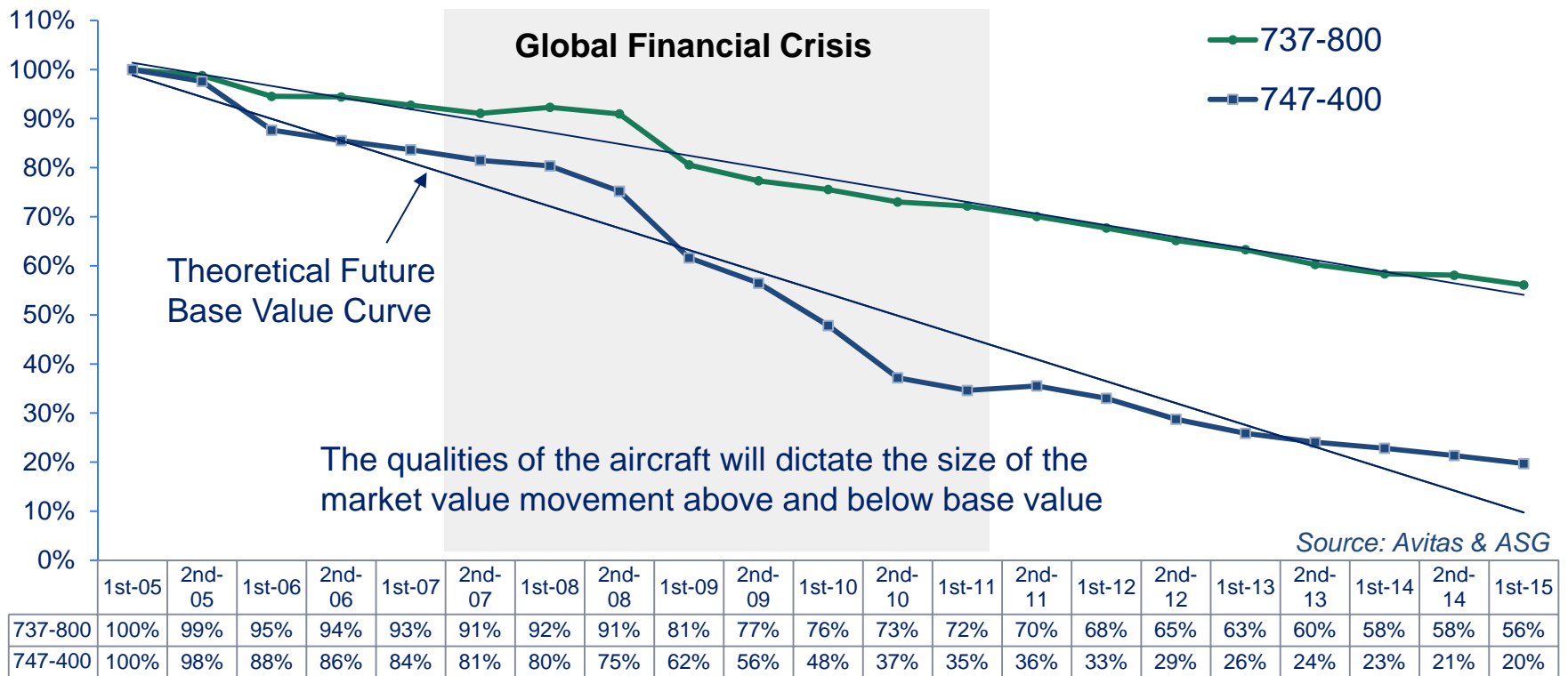
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Aircraft Value Cycles & When to Invest

Relative half-life CMV performance through the cycle



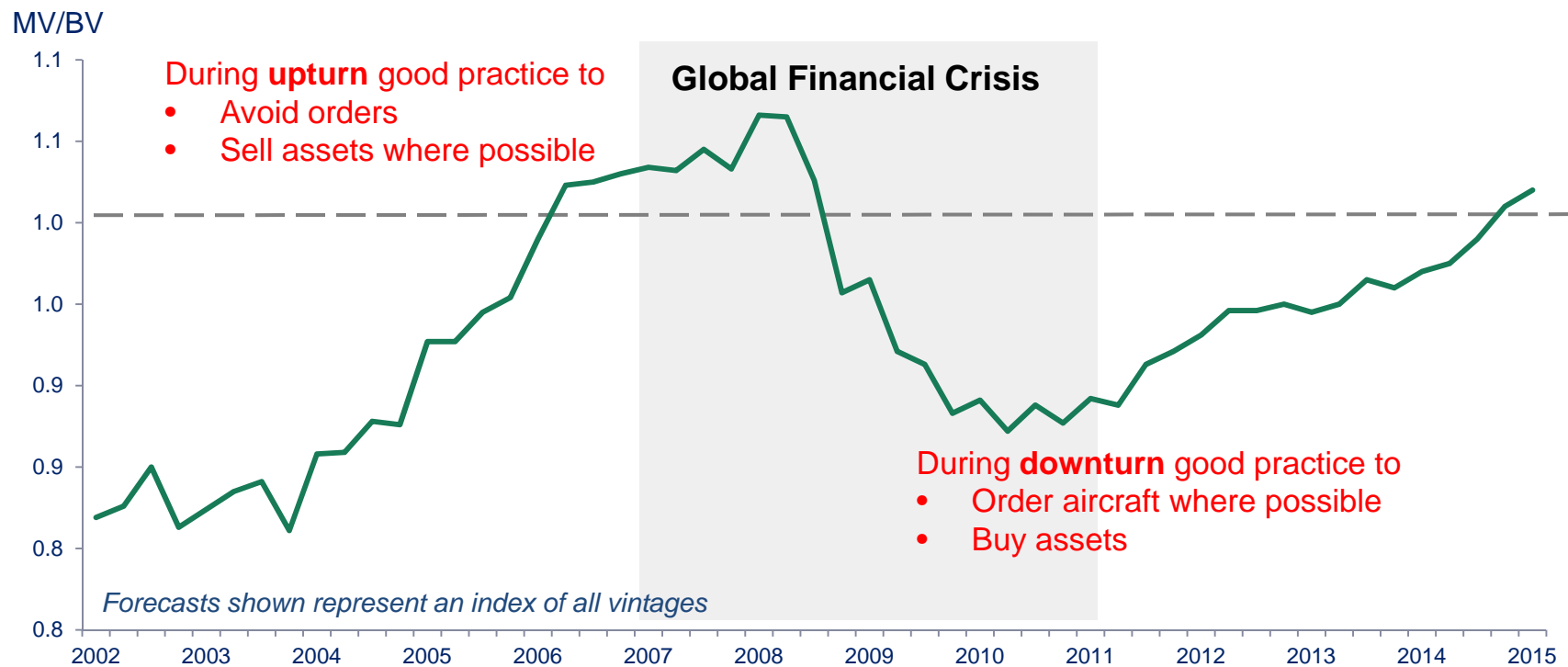
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Aircraft Value Cycles & When to Invest

When aircraft market **values rise above intrinsic base values**, it indicates market is reaching cyclical peak



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Aircraft Value Cycles & When to Invest

Rule # 1: Most economic events prove to be cyclical

Rule # 2 : Some of the greatest opportunities for gain and loss come when other people forget rule number one

Thank You