# Funding the Future

## Matching The Demand For Aircraft With The Supply Of Capital

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AVOLON

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Dick Forsberg has over 40 years' aviation industry experience, working in a variety of roles with airlines, operating lessors, arrangers and capital providers in the disciplines of business strategy, industry analysis and forecasting, asset valuation, portfolio risk management and airline credit assessment. As a founding executive and Head of Strategy at Avolon, his responsibilities include defining the trading cycle of the business, primary interface with the aircraft appraisal and valuation community, industry analysis and forecasting, driving thought leadership initiatives, setting portfolio risk management criteria and determining capital allocation targets. Prior to Avolon, Dick was a founding executive at RBS (now SMBC) Aviation Capital and previously worked with IAMG, GECAS and GPA following a 20-year career in the UK airline industry. Dick has a Diploma in Business Studies and in Marketing from the UK Institute of Marketing is a member of the Royal Aeronautical Society and also a Board Director of ISTAT (The International Society of Transport Aircraft Trading).

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## Introduction

The aviation industry will take delivery of $3.5 trillion of new commercial jets aircraft over the next 20 years, with an average of $125bn of funding required over the next decade alone. This paper summarises the supply and demand drivers underpinning the growth of commercial aviation, sets out Avolon's forecast of future deliveries and examines the main sources of financing supporting the airlines, lessors and manufacturers now and into the future.

The paper examines the scale of the financing challenge and suggests how the various funding channels will develop over the next ten years. The paper also identifies the requirement for new funding sources, describes their likely characteristics and sets out the case for substantial investment in, and funding of, operating lessors by global financial institutions such as pension funds and insurance companies, which will be a crucial element of the future financing mix for the industry.

The current level of new aircraft deliveries creates a requirement for $100bn annually, more than 75% of which is, and will continue to be, financed by a combination of commercial banks, aircraft lessors and export credit agency support.

Despite large parts of the commercial banking sector facing regulatory and budgetary constraints since the financial crisis, secured lending remains a core part of the overall aircraft financing mix, with new lenders in emerging markets playing an increasingly significant role. Avolon expects commercial debt to account for around $40bn a year of new aircraft delivery finance over the coming decade.

The export credit agencies, which provided essential market support through the financial crisis, have subsequently remained extremely active, however, despite the development of new structured products to support them, ECA activity is expected to decline over the coming years to less than 15% of total delivery funding.

Conversely, the lessor channel is forecast to increase its top-line share of new aircraft financing from around 40% to close to 50% within ten years, with up to 50% of total lessor liquidity being sourced internally, from their own balance sheets or "true" shareholder equity.

The capital markets have grown rapidly to take up to 10% of the delivery financing market through a combination of EETC, securitisation and bond products, with further growth potential to double their volume contribution to over $20bn a year by the end of the decade.

An additional deep pool of new capital residing with fixed income funds and other global investment managers is starting to be tapped by lessors, whose business models can offer attractive returns consistent with the objectives of such investors. Their buy-in to the aviation sector represents a key inflexion point for the next phase of commercial aviation development and Avolon expects that, in ten years time, up to $10bn of "new money" will be invested annually, as awareness and commitment to the sector develops.

## Key Findings

- More than 35,000 new aircraft will be delivered over the next 20 years, requiring $3.5 trillion in financing including over $100bn next year and an average of $125bn annually over the next decade
- Aircraft lessors will increase their share of new delivery financing, from close to 40% today to 50% by the middle of the next decade
- Collectively, the lessors fund half of their capital requirements internally, with half of this sourced from "true" investor equity, the other half from their balance sheets or those of their parents.
- Lessors will become more reliant on external funding channels in order to achieve their future growth potential and new sources of liquidity will be required.
- Investing in aircraft, particularly through the medium of a full service leasing platform, can be demonstrated to generate attractive, low volatility returns through the cycle. These characteristics lend themselves to global investors such as fixed income funds that to date have not taken any significant "metal" positions in the sector.
- An active trading strategy layered onto a lessor portfolio of young and highly liquid aircraft types further enhances the earnings characteristics and risk profile of the enterprise. Such business models will be at the forefront of what is expected to be a substantial influx of new investment, providing up to 7.5% of the total requirement for new aircraft financing within ten years

## Funding The Future

**1. Drivers of Demand**

If the past decade has taught us one thing, it is that we should not be overly concerned about the sustainability of the airline industry. In 2012, despite an average oil price in excess of $110 per barrel, the world's airlines earned a collective operating profit of almost $15bn and net profit of $7.6bn. Even where profits remain elusive, cost and efficiency improvements and structural changes continue to improve airline bottom lines and airlines are now much more capable than heretofore of dealing with expensive fuel, which can represent up to 50% of their operating costs.

The demand for air travel and consequently also for aircraft supply is closely and consistently linked to global and regional macro-economic activity. Passenger traffic, measured by RPKs[1], has increased at an annualized average rate of 5.7% since 1972, whilst world GDP grew on average by 3.2% a year[2]. This represents a GDP growth multiple of 1.6x, a figure that typically has ranged between 1.5x and 2.0x over the past 40 years (Figure 1), with a high degree of correlation between the two sets of values sustained through successive economic cycles. A simple statistical analysis of GDP and RPK indices since 1972 produces an almost perfect $R^2$ correlation of more than 0.99 and, even when the data are restricted to the period since 2001, the relationship remains extremely strong, with an $R^2$ of 0.989.

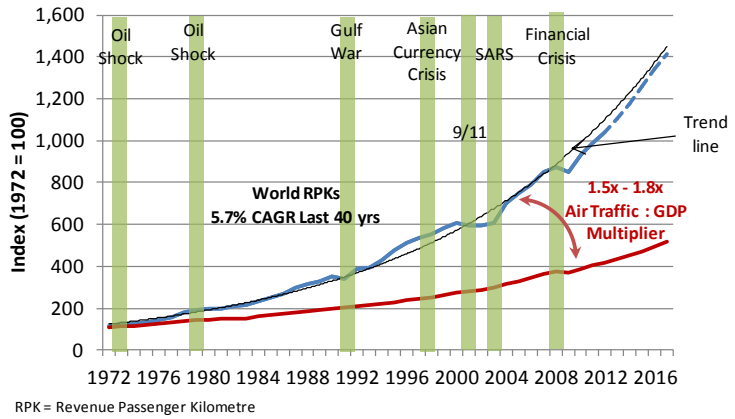
[1] RPKs (Revenue Passenger Kilometres) are the product of the number of passengers carried multiplied by the distance travelled

[2] World GDP measured in constant US dollars (Source: IMF)

One important element of global GDP is the contribution made by trade and since 1972 the value of world trade has increased at an average rate of 6.2%. A similarly significant correlation exists between the growth in world trade and airline passenger traffic and, although combining GDP and world trade data does not improve the statistical fit for traffic growth, such an analysis confirms not only that there is a close relationship between the three elements, but also that this relationship is extremely robust and sustainable through economic cycles and despite changing global conditions.

The persistent reversion of airline traffic growth to the underlying trend line seen in Figure 1 also strongly supports the thesis that, whilst traffic can be suppressed by severe exogenous events, the demand is not permanently "lost" but is recovered over time. Many of the driving forces for this to occur can be found in the dynamic changes in regional economic activity which are also reflected in air traffic demand and airline activity.

**Figure 1 – GDP and Traffic Growth Trends**




*Source: IMF, Airline Monitor, Company (forecast)*

Commercial airlines provide essential infrastructure links in many of the world's fastest-growing economies and are a key component of that growth. The dynamics of supply and demand for aircraft and their associated financing are expected by a wide cross-section of industry analysts to accelerate over the coming years, driven by economic and demographic changes in emerging markets.

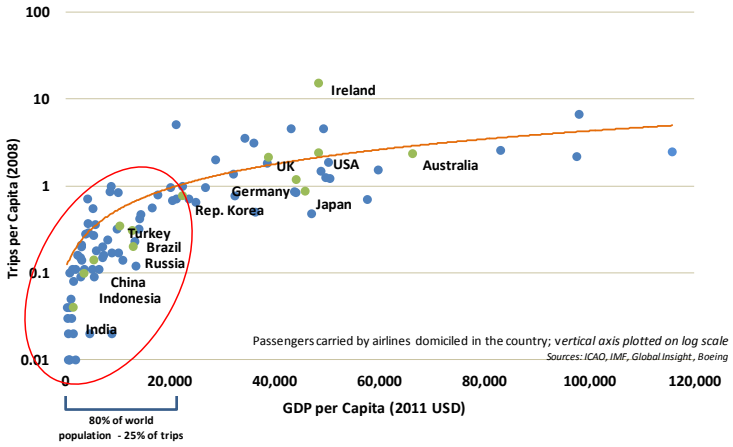
All of the long-term industry trends, from traffic growth in emerging markets and the shift of regional influences to the development and delivery of future generations of commercial aircraft and the deep pools of capital looking for secure risk-adjusted returns, suggest that we are entering a "Golden Age" of aviation, for which the past 20 years have been a mere warm-up act.

Over 56 million people globally are now employed in aviation and related tourism industries; if aviation were a country, it would rank 19th in terms of GDP; by 2026, the Air Transport Action Group ("ATAG") forecasts that the industry will contribute US$1 trillion to the world economy. Aviation has proven to be highly resilient to economic stress, with only three years in the past 40 when passenger traffic has declined in absolute terms.

The demand for air travel is increasingly underpinned by the dynamics of emerging markets, as air travel in the mature western economies grows more slowly. The strength of emerging markets can

be linked to a number of factors – economic, demographic, geographic and political. Many of the fastest growing economies are seeing a rapid increase in their middle-class populations, where a relatively small increase in personal disposable income triggers the ability to utilize air travel for the first time. In Figure 2 below, which tracks the correlation between disposable income and the propensity to travel by air, it can be seen that 80% of the world population lives in countries that currently have only 25% of air services, situated around the steepest part of the growth curve, where relatively small improvements in personal economic status can trigger large increases in air travel.

**Figure 2 – Traffic and The Propensity to Fly**




*Source: ICAO, IMF, Global Insight, Boeing*

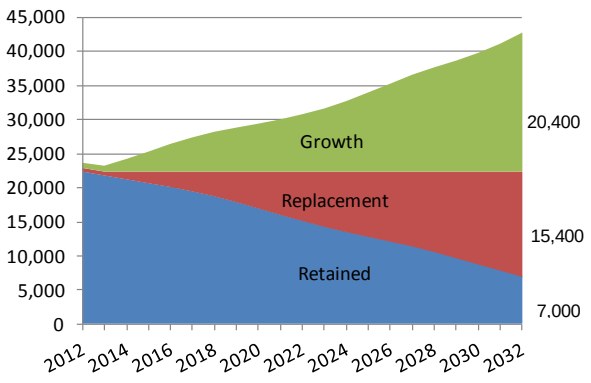
Coupled with large absolute populations and, in many cases, geographies that give significant advantages to air travel over surface alternatives (island nations, undeveloped road or rail infrastructure, long distances), the growth potential in some of the largest and most rapidly growing countries (such as China, India, Brazil and Indonesia) will support substantial commercial air transport expansion over the coming decades. The emergence of new airline business models, most notably low cost airlines, provides the means to deliver affordable air travel in these markets, whilst market deregulation and liberalization provide further accelerants to growth.

Over the next 20 years, these developments will rebalance the regional distribution of air travel and capacity away from the traditional dominance of North America and Europe towards emerging markets, with the Asia Pacific region becoming dominant with up to 40% of global air travel.

**2. Supply side growth**

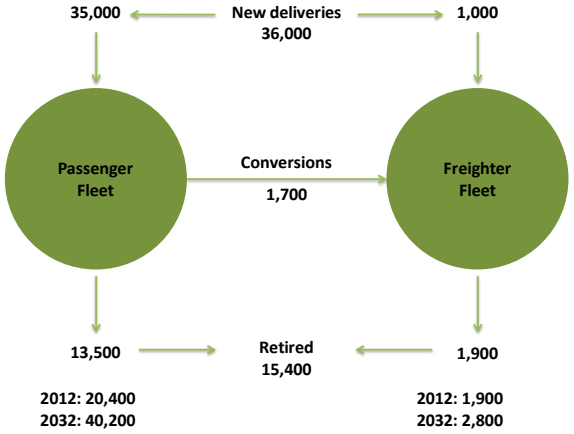
On the supply side, Avolon is forecasting that more than 35,000 new aircraft will be delivered over the next 20 years, over 40% of which will be used to replace the rising number of older and less efficient aircraft currently in service and approaching their retirement age. The remaining deliveries will be used to satisfy the requirements for market growth (Figure 3). As a result, Avolon expects the world commercial jet fleet to double in size from 22,000 to 43,000 aircraft by 2032 (Figure 4).

**Figure 3 – 20 Year Delivery Forecast**



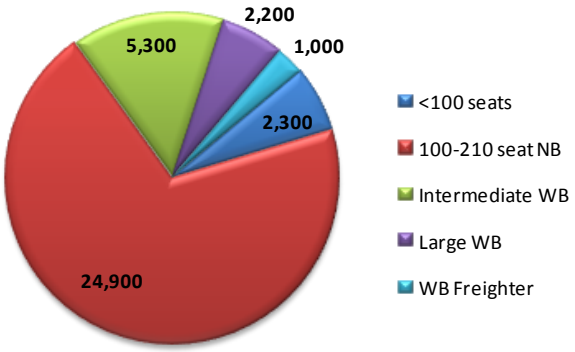

*Source: Company forecast*

**Figure 4 – 20 Year World Fleet Forecast**




Much of the capacity growth will be met through deliveries of single aisle aircraft, which Avolon anticipates will account for almost 80% of future production and 50% of delivery value. Almost half of the total, and 2/3rds of narrowbodies, will be in the 160-180 seat category, which includes A320s, 737-800s and their replacements (Figure 5).

**Figure 5 – 20 Year Future Deliveries Forecast by Category**



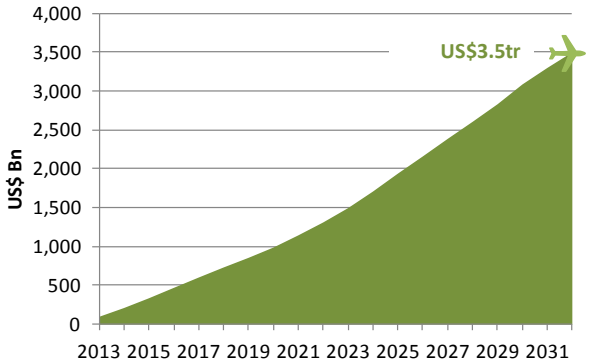

*Source: Company forecast*

Almost 50% of single aisle deliveries will be utilised to replace ageing fleets of less efficient aircraft, compared to closer to 40% of twin aisle aircraft, where the installed fleets are both smaller and, on average, younger. Twin aisle deliveries will also be boosted over the rest of this decade by the pent-up demand for new generation models such as the A350 and 787, which have performance and efficiency characteristics that appeal to a wide range of operators and, equally, market liquidity characteristics that are attractive to investors and lessors. Avolon forecasts that 15% of deliveries (5,300 aircraft) will be intermediate widebodies (A330s, A350s, 787s, etc) and 6% (2,200 aircraft) will be large widebodies (747s, 777s, A350-1000s, A380s). The majority of aircraft delivering into the future will meet the strict investment liquidity criteria applied by many lessors, creating further impetus to the growth of operating leasing as a financing tool.

The cost of those 35,000 aircraft deliveries over the next 20 years will exceed US$3.5 trillion in delivery dollars, with the annual cost of new deliveries reaching $100bn for the first time in 2013 and

an average of $125bn required in each of the next ten years (Figure 6) to finance the delivery of more than 15,000 new aircraft.

**Figure 6 – Cumulative Delivery Financing Requirement for $3.5tr Over 20 Years**




*Source: Company forecast*

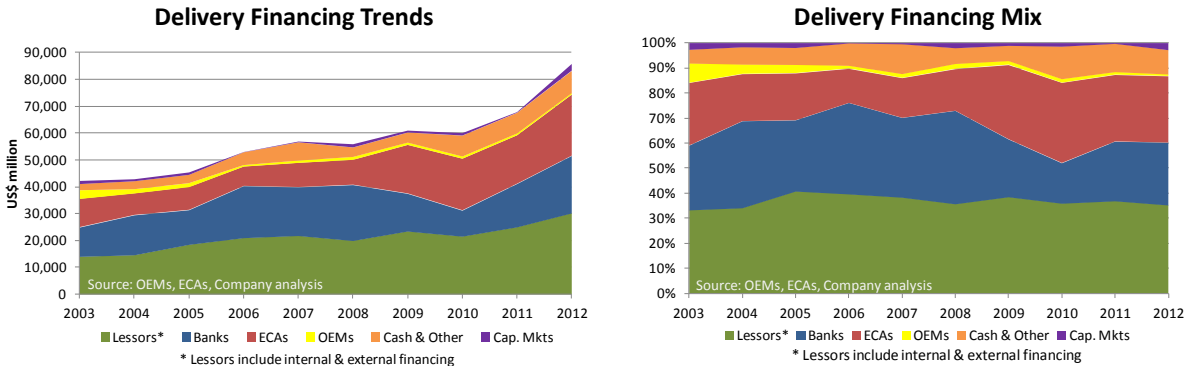
**3. The Financing Challenge**

Despite the many challenges faced over the past decade, there are few examples of aircraft failing to deliver due to lack of financing. As liquidity has become more scarce and commercial terms more onerous and selective towards better credit quality borrowers (the "flight to quality"), alternative funding sources have been found to bridge the financing gap and creative solutions developed to ensure that products remain both competitive and accessible.

Most new aircraft are financed through three "mainstream" funding channels - commercial bank debt, export credit support and operating lessors - in more or less equal shares over the past decade. Figure 7 highlights not only the steady rise in delivery funding requirements over time, but also the dynamic nature of the key moving parts as they respond to the broader economic cycle. The rapid expansion of commercial bank activity in the middle of the last decade is evident, as is their sharp contraction following the financial crisis and the sluggish nature of their subsequent re-engagement. The lessor segment, on the other hand, followed a more stable growth trajectory through the decade, with a plateau after 2008 as a number of their parent companies suffered from capital constraints or more serious structural issues, but showing a robust recovery in the past two years. The ECAs, as has been widely reported, stepped into the post-2008 funding gap with great enthusiasm, fully able to support deliveries through a combination of strong budgetary support from their respective governments and competitive pricing under the then-prevailing ASU rules further enhanced in many cases by discounts available to Cape Town Treaty signatories. Indeed, the ECAs did exactly what they were designed for during this period, thus avoiding a build-up of unfinanced white-tails and also relieving the OEMs of what would otherwise have been a significant increase in their balance-sheet utilisation.

Whilst contributions to delivery financing from capital markets products, including securitisations and EETCs, can be substantial, they have historically been limited to the stronger phases of the cycle, with the ABS market opening infrequently (no material activity since 2007) for relatively short periods of time and minimal EETC capacity outside the US until very recently. A surge in bond activity has provided a substantial and welcome recent boost to overall funding capacity.

**Figure 7 –Delivery Financing Trends and Shares**

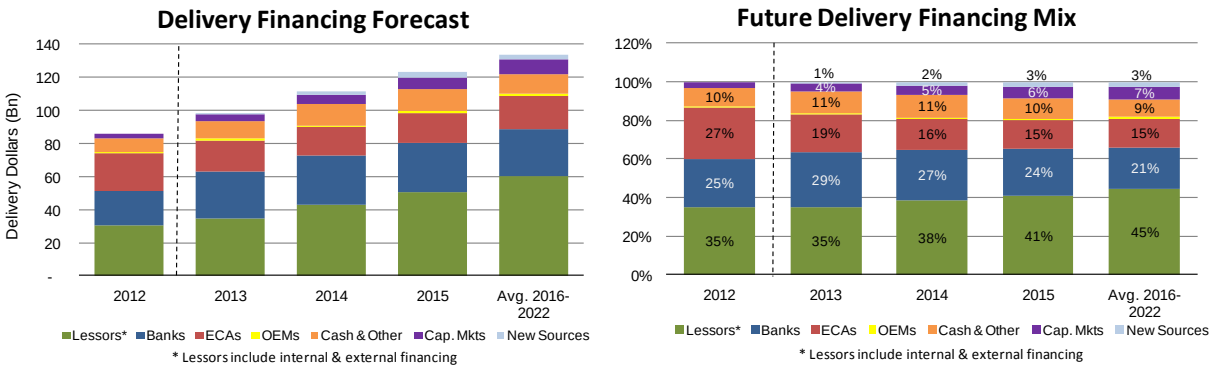



*Source: OEMs, ECAs, Company estimates*

**4. Financing the next 10 years' deliveries**

Avolon expects the three sector mainstays of aircraft financing to retain their dominant role over the coming decade, although their relative and absolute levels of contribution will evolve from where they sit today. The operating lessors are well placed to significantly increase their participation, whilst export credit will play a much smaller role and secured lending will also see a reduction in market share. As shown in Figure 8, these three channels will continue to finance more than 80% of new aircraft deliveries over the next 10 years, amounting to $1 trillion. The balance of over $250bn will be financed by a combination of capital markets products, cash from retained airline earnings and other, new sources of liquidity that tap into deep pools of global investment capital such as the fixed income funds held and deployed by insurance companies and pension managers. The OEMs' balance sheets are not expected to play a significant role going forward although they will continue to participate as financiers of last resort.

**Figure 8 – Ten Year Delivery Financing**




*Source: OEMs, ECAs, Company estimates*

***4.1. Return of the bankers***

The resurgence of secured lending from traditional aviation banks that has occurred since the start of 2013 is welcome and reflects their underlying confidence in the characteristics of the sector. New lenders are also entering the market, with more regional banks ready to expand their roles beyond local relationship lending and existing participants are upping their game, particularly in respect of the leasing sector, where they recognise the value of having aligned interests in asset management.

The eastward shift in the aviation centre of gravity will accelerate and more Asian banks will take equity as well as debt positions in commercial aircraft. However, most emerging financial markets will remain insufficiently developed to support significant expansion of local bank engagement in aircraft financing, too often hampered by restrictive regulatory and fiscal contraints on capacity, term and intereest rates.

Stricter bank regulation and more stringent capital requirements have already obliged a number of Western lenders to reduce or even eliminate their exposure, giving rise to justifiable fears that full implementation of Basel III could result in commercial lending becoming a marginalised channel for aircraft finance, at least for Western banks. Avolon believes that such concerns are over-stated, but tougher capital adequacy tests and tighter leverage and liquidity limits will result in higher bank funding costs and lower budgetary limits, adding impetus to the growth of capital markets, where the same regulatory and cost factors do not apply.

Avolon expects that commercial bank lending will continue to be an important source of delivery financing, but with a more globalised profile. Direct bank lending will stabilise in a relatively narrow range around $30bn per annum over the next ten years, whilst market share will decline slowlyfrom almost 30% to close to 20%. Bank lending to lessors has considerable scope to increase within their total volume and bank ownership of leasing platforms will also expand further as an alternative route to growing balance sheet exposure to the sector, creating very powerful business models where metal and money come under one roof.

### *4.2. The outlook for Export Credit*

Long after the financial crisis had peaked, the export credit agencies were supporting very significant volumes of new deliveries. Market pressure arising from a sense that they had become mainstream capital providers instead of lenders of last resort brought about a series changes to the rules and terms under which they operate. The new 2011 Aircraft Sector Understanding (“ASU”), which was implemented on 1st January 2013, differs from the earlier ASU in several key aspects, notably i) elimination of aircraft categories and their respective rules, ii) an increase in the minimum premia payable and iii) requirement for additional risk mitigants for weaker credit borrowers.

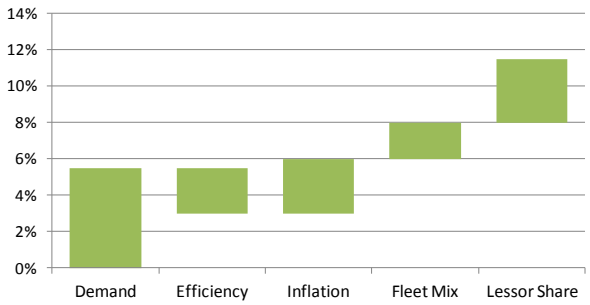
Consequently, accessing ECA support is now more expensive and has more restrictive conditions than heretofore - however, there has been little evidence of a slowdown so far. Low interest rates are helping to keep the overall cost competitive, as are newly developed ECA and Exim bond products, which already account for around 15% of ECA volume. The Cape Town Treaty also plays a supporting role, with premium discounts of up to 10% available for borrowers in signatory jurisdictions. Nevertheless, demand for ECAs is expected to decline from recent levels and thereafter remain flat in dollar terms at a around $20bn per annum, which represents a material decline in funding share, from peak levels of more than 30% to 15% by the middle of the decade.

### *4.3. The expanding role of lessors*

Since 2007, as a result of the turbulence in the financial markets, the lessors have seen their share of delivery financing fall from a peak of 40% to the mid-30% range, but have still been providing US$25 - $30 billion of liquidity a year. Avolon expects this volume to reach $35bn in 2013 and over $40bn in 2014, levels that are equivalent to the industry's total funding requirement from all channels a decade ago

Over the medium term, Avolon is forecasting that funding through the lessor channel will grow on average by more than 10% per annum, as illustrated in Figure 9. This will be achieved through a combination of capital supply and demand factors. On the demand side are overall traffic growth averaging >5% per annum, offset by airline operating efficiencies, plus underlying aircraft price inflation and a market trend towards larger capacity, and therefore more expensive, aircraft. On the supply side, lessors will take up a disproportionate share of new liquidity attracted by the quality of the risk-adjusted returns available.

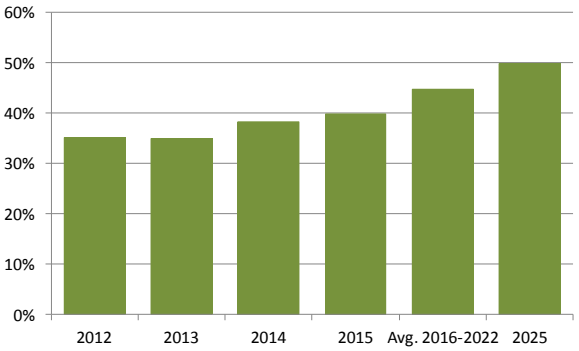
**Figure 9 – Annual Growth Potential of the Lessor Channel**




*Source: Company*

Taken together, the lessors' share of new aircraft deliveries is forecast to increase by an average of 10% - 12% per annum to reach between 45% and 50% of all new delivery financing by the middle of the next decade (Figure 10).

**Figure 10 – Lessor Share of Commercial Jet Delivery Financing**




*Source: Ascend, Company analysis*

### *4.4. Capital markets*

The EETC, still the most prolific capital markets instrument utilised in aircraft financing, remains largely confined to the US market. EETC issuance exceeded $4.3bn in 2012 and is on track to double that figure in 2013, with over $7bn closed by mid-October. In addition to financing new deliveries, EETCs are widely used by US airlines to refinance used aircraft, accounting for around 50% of such transactions over the past ten years.

Until recently, EETCs have been almost exclusively a US product, with only four EETCs issued outside the US - Air France in 2003 and the Iberia Airlines “Iberbond” transactions of 1999, 2000 and 2004. This began to change in 2012, when Doric launched the first of what are to date three funds secured by Emirates A380s. In mid-2013, BA closed a $927m EETC financing of 14 aircraft (A320s, 787s and 777-300ERs) into a JOLCO structure. The latest international offering, in October 2013, was from Virgin Australia, in an $800m enhanced equipment note (a form of EETC) secured by a collateralised pool of 24 aircraft currently in their fleet.

The economics offered by specialist funds such as Doric Nimrod help to explain why this has the potential to develop into a much more substantial source of liquidity for the industry. Doric Nimrod One (the first of their funds) raised £40 million from investors in 2010 after listing on the London SFM market, then added $122 million of debt to acquire a single A380 which was leased to Emirates for 12 years. The debt is structured to amortise over the life of the lease at which point the fund will own the aircraft outright. With net sales proceeds to be added to dividends paid during the course of the lease term, this investment proposition should be capable of replication to support significant inflows of capital for mainstream aircraft types.

One of the essential elements needed to make EETC-type structures acceptable outside the US is ratification of the Cape Town Treaty by the relevant jurisdiction. An EETC enhances the credit of a traditional equipment trust certificate ("ETC") secured by lease receivables and the leased aircraft in three ways: i) the EETC issuer is bankruptcy remote; ii) the EETCs are tranched to reflect levels of access to the expected residual value of the aircraft; iii) a liquidity facility is provided to cover continued interest payments for a period in the event of a lessee default. In the USA, the liquidity facility relies on the ability to repossess an aircraft from a bankrupt lessee under Section 1110. The principal difficulty in EETC securitizations with non-US airlines is the availability of Section 1110 equivalent repossession rights, i.e., the ability to repossess and remarket the leased aircraft in a time frame comparable to that allowed by Section 1110.

More governments are now getting behind the Cape Town initiative and making the appropriate treaty ratifications, with Canada and Ireland amongst recent adopters. The extension of EETCs beyond the US will be a key facilitator of global airline financing, offering the combined attractions of deep pools of capital, freedom from the vagaries of banking market regulation and security based on asset quality rather than airline credit quality.

Portfolio securitisations represent a smaller and more cyclical element of the capital markets that, when open for business, provide another attractive channel for lessors to access the public markets. A portfolio securitization relies on a diversified portfolio of aircraft on operating leases to a number of airlines, both in the U.S. and in other countries. Rather than enhancing a single corporate credit,

the ratings of the debt securities issued in a portfolio securitization are based on the global leasing market and the projected residual values of the aircraft in the portfolio. The actual levels of the rating depends on a number of factors, including the age, initial value and diversity of the aircraft in the portfolio; the diversity (both individually and geographically) of the lessees of the aircraft and, to a lesser extent, their credit quality; the quality of the servicer and the initial level of lease rentals.

The securitisation market was dormant from 2007/08 until early 2013, when GECAS closed a $650m, 26 aircraft ABS transaction (actually a quasi term loan). In mid-October 2013, Avolon launched US$636 million of Fixed Rate Asset Backed Notes for Emerald Aviation Finance, which will use the proceeds to acquire 20 aircraft from Avolon. More lessor ABS transactions are expected to follow, although the relative paucity of portfolio securitizations relative to EETCs will continue to reflect the greater difficulty, time and resource involved in such transactions. A single entity owning a portfolio with the right mix of aircraft is required, as well as sufficient marginal benefit in the reduction of borrowing costs to warrant the time and expense involved in doing the transaction, with timing also a critical factor at the mercy of short-term movements of the markets.

In addition to the growth in ABS activity, there has been a marked increase in usage of the unsecured bond market by airlines and lessors. Around $6bn of unsecured bonds have been issued to airlines over the past 18 months, much of which has been, or will be applied to financing fleet deliveries as well as re-financing assets already in their fleets. Lessor activity in the bond market has seen a similar surge, including first time issues for AerCap and ALC and repeat business for AWAS, Aircastle, ACG and ILFC. More than $9bn of unsecured notes were issued in 2012, with a further $4bn in the first five months of 2013, the majority of which will be applied to financing new deliveries. This sharp rise in bond activity has been spurred by a combination of the contraction in the secured debt market, more expensive ECA funding and a resurgence of interest from the wider high yield market – total US and European bond issuance exceeded $2 trillion in 2012, the highest level since 2009, and 2013 has been running at the same rate. The competitive advantage to lessors in having access to funding that can be applied flexibly as investment opportunities arise, versus financing specific assets, will drive significant further growth in this area, with more lessors seeking corporate ratings to allow them to tap into the bond market in contrast to having only a single rated lessor during earlier cycles.

However, this channel comes with a health warnng. The bond market is sensitive to a range of macro factors, including fiscal policy, interest rates, inflation, the underlying performance of the economy and the strength of the equity markets, all of which have been supporting the run up of bond activity, but could also reverse the trend at some point as the global economy moves into a stronger recovery phase.

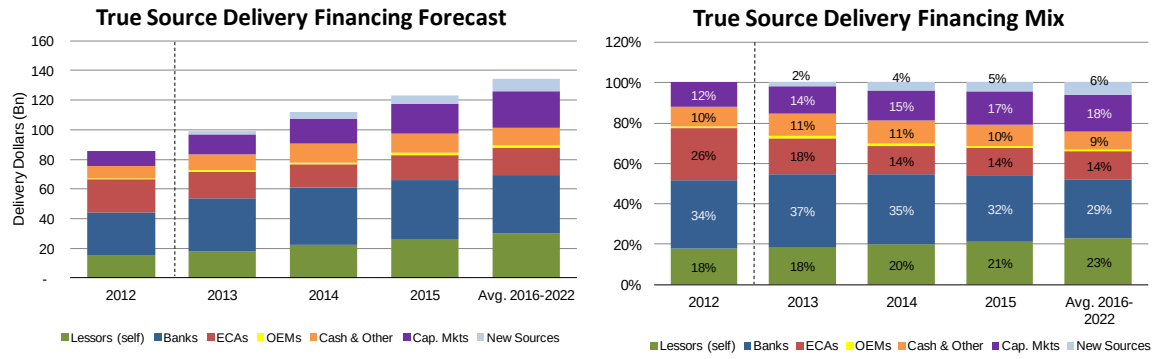
### *4.5. True sources of liquidity*

The foregoing analysis considers each of the financing channels as a discrete source of capital in its own right. In fact, of course, banks lend to lessors as well as airlines, investors participate in financial instruments as well as physical assets and many lessors are not funded exclusively from their own balance sheets or equity investors, but tap into a variety of external liquidity sources, including banks, ECAs and the bond markets. When delivery funding is re-allocated to the true sources of

liquidity, as shown in Figure 11, the actual scale of the role played by the banking sector can be seen to be even more significant – up to 35% larger than is apparent under the previous methodology. Equally striking is the true scale of capital markets activity when bond issuance, particularly to lessors, is added back –already accounting for well over 10% of total new delivery funding.

The current mix of lessor ownership profiles and financing strategies results in 50% of all lessor funding being sourced internally from a combination of equity, retained cash flow and, in the case of those with financial institution parents, internal balance sheets. Within the total equity requirement, half is "true" equity from investors and shareholders, with the other half coming from in-house or parent company balance sheets. Sourcing of the external component has broadened over the past decade from a heavy reliance on commercial loans to a dynamic blend of funding that takes in banks, ECAs and capital markets products. The pure self-funded element of the operating lessors presently accounts for just under 20% of all new delivery financing.

**Figure 11 – "True" Delivery Financing**




*Source: OEMs, ECAs, Company estimates*

Avolon's outlook for the next ten years, using the "true sources" methodology, suggests that the commercial banks will broadly plateau in volume terms from 2014 onwards, funding around $40bn of new business annually, which represents a declining share of the total from over 35% to less than 30% after ten years.

The ECA share will still decline steeply over the coming decade, from 26% to 14%, despite the support of the evolving structured bond products. ECA volume will remain steadier, but decline from recent levels of well above $20bn into the mid- to high-teens.

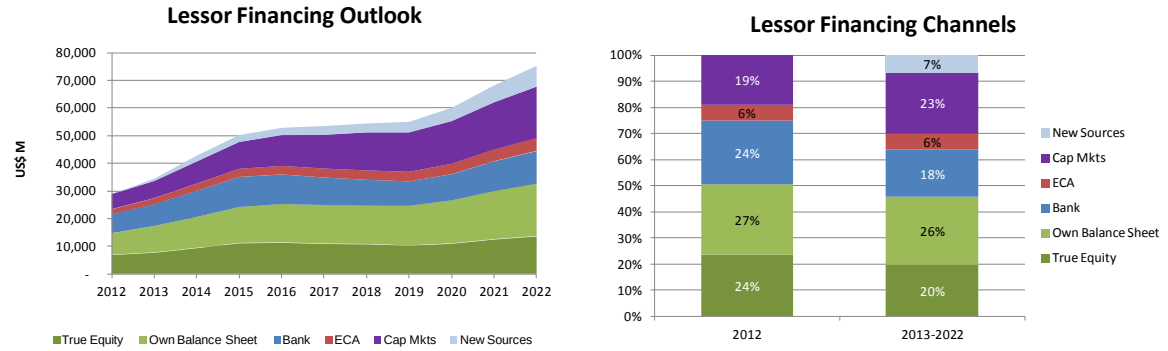
Capital markets will exhibit strong underlying growth, boosted by an expansion in international EETC activity, further ABS securitisations and an appetite for airline and lessor bond issuance, with more lessors in particular seeking to secure corporate ratings. Capital markets financing is expected to exceed $20bn per annum by the end of the decade.

A critical growth segment identifiable in Figure 11 is "new sources", which Avolon expects will support up to 7.5% of delivery financing within ten years – potentially $10bn a year by 2022. New pools of capital from institutional investors will increasingly find their way into the aviation space as the risk adjusted investment returns and their attractiveness relative to other asset classes become more widely recognised. Most of this new capital will be directed towards the operating lessors, as

their asset management capabilities deliver significant value enhancement and essential risk mitigation for investors.

As the lessor channel expands from 40% to 50% of total financing, all of the elements that make up their funding will increase in volume terms (Figure 12). The lessors' "true" equity and internally funded components will each more than double in volume over then next decade, but will represent a smaller share of the total lessor mix as new sources of funding grow in significance. This shift will also reduce the commercial banking element of lessor financing, which will increase by up to 50% in dollar terms, but decline as a share from 24% to 17% over the decade. ECAs will continue to provide a modest 6% of the total on average, with capital markets tripling in volume and increasing their share above 20%. New financing sources, such as fixed income funds, will grow steadily to account for 10% of the lessor total by 2022, providing up to $8bn in annual funding.

**Figure 12 – Lessor Financing Mix**




*Source: OEMs, ECAs, Company estimates*

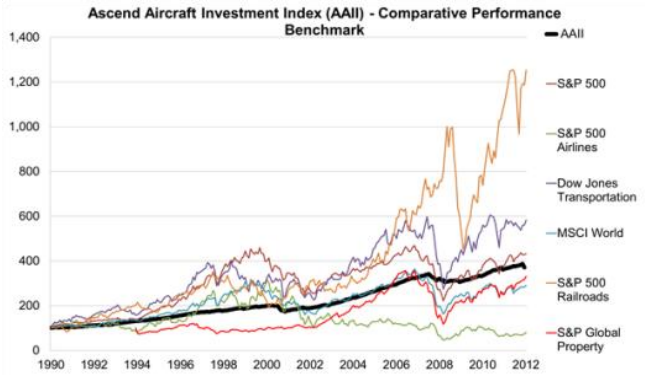
## Aircraft as investments

Investment in commercial aircraft managed by lessors can tick a number of important boxes for global financial institutions - attractive net income margins (NIM), returns on equity (ROE) and returns on assets (ROA) relative to other asset classes, with lower volatility; long term industry fundamentals that are strong and growing; an opportunity to deploy significant amounts of capital, all backed by mobile assets and diversified globally; provides a hedge to the equity markets.

Although the wider airline industry has exhibited substantial volatility over the past 20 years, investment in aircraft leasing has delivered remarkably stable returns. Historically, returns from aircraft leasing have shown low correlation with those reflecting the wider economy. On a risk-adjusted basis, these returns have outperformed many other asset classes including equities, shipping and property.

The returns profile for a generic, unlevered leasing portfolio of "average" aircraft types of an "average" age managed under a passive investment strategy (i.e. no trading to refresh portfolio age or capture cyclic value benefits) is shown in Figure 13. It is benchmarked against a range of alternative asset classes including equities, rail, property and airlines and its low relative volatility and consistent mid-range returns can be clearly seen, even at this unsophisticated portfolio level.

**Figure 13 – Index of Generic "Average" Aircraft Portfolio Returns**




*Source: Ascend AAII*

Tuning the portfolio to contain exclusively young (0-5 years) highly liquid assets and applying an active, through the cycle investment strategy further reduces volatility and significantly increases return margins relative to the baseline leasing scenario, as asset quality, age and an experience-based active approach to trading are all positive value enhancers.

The nature of the returns profile for this lessor business model is well-suited to the requirements of fixed income funds, having low volatility and low/mid-teens through-the-cycle margins. These deep global pools of as yet untapped investor capital represent a natural development for the next growth phase of aerospace capital.

Over the next five years, aircraft lessors will acquire $250bn of assets, requiring more than $50bn in true equity capital. Whilst private equity and the public markets will continue to be active supporters, new sources of capital will also need to be brought into the frame.

A small number of fixed income funds have already invested in the sector, including three Canadian pension funds, Ontario Teachers (with a 10% stake in Aircastle), Omers and CPPIB (both invested in AWAS), whilst Investec attracted three Australian superannuation funds into their Global Aviation Fund five years ago. Leasing companies are now starting to actively target insurance companies, pension funds and other long term investors and fund managers in a more concerted manner, to build awareness and interest in an investment story with the potential to generate significant contributions to their external funding needs.

## Conclusions

- Commercial aviation provides essential infrastructure links and is a key component of economic growth
- Strong fundamentals underpin demand for air travel, which has demonstrated a high degree of resilience to external shocks
- The dynamics of supply and demand are set to accelerate over the coming years, driven by economic and demographic changes in emerging markets
- More than 35,000 new aircraft will be delivered over the next 20 years, requiring $3.5 trillion in financing including over $100bn next year and an average of $125bn annually over the next decade
- The three “mainstream” funding channels of commercial banks, aircraft lessors and export credit agencies currently finance over 80% of new aircraft deliveries – in broadly equal shares
- Capital markets are taking an increasing share of the total, through EETCs, securitisations and bond issuance, currently meeting over 10% of all funding requirements for new deliveries
- Market and regulatory forces will constrain the level of future participation by commercial lenders and the export credit agencies, whilst aircraft lessors will increase their share of financing, from approaching 40% today to 50% by the middle of the next decade
- Collectively, the lessors fund half of their capital requirements internally, with half of this sourced from “true” investor equity, the other half from their balance sheets or those of their parents.
- Whilst lessors are expected to grow to take half of the market for new aircraft financing, they will also become more reliant on external funding channels. In order to achieve their future growth potential, significant new sources of liquidity will be required.
- Investing in aircraft, particularly through the medium of a full service leasing platform, can be demonstrated to generate attractive, low volatility returns through the cycle. These characteristics lend themselves to global investors such as fixed income funds that to date have not taken any significant positions in the sector
- An active trading strategy layered onto a lessor portfolio of young and highly liquid aircraft types will further enhance the earnings characteristics and risk profile of the enterprise. Such business models will be at the forefront of what is expected to be a substantial influx of new investment, providing up to 7.5% of the total requirement for new aircraft financing within ten years