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FINANCING THE 777: DVB DISCUSSES THE FAMILY'S MERITS

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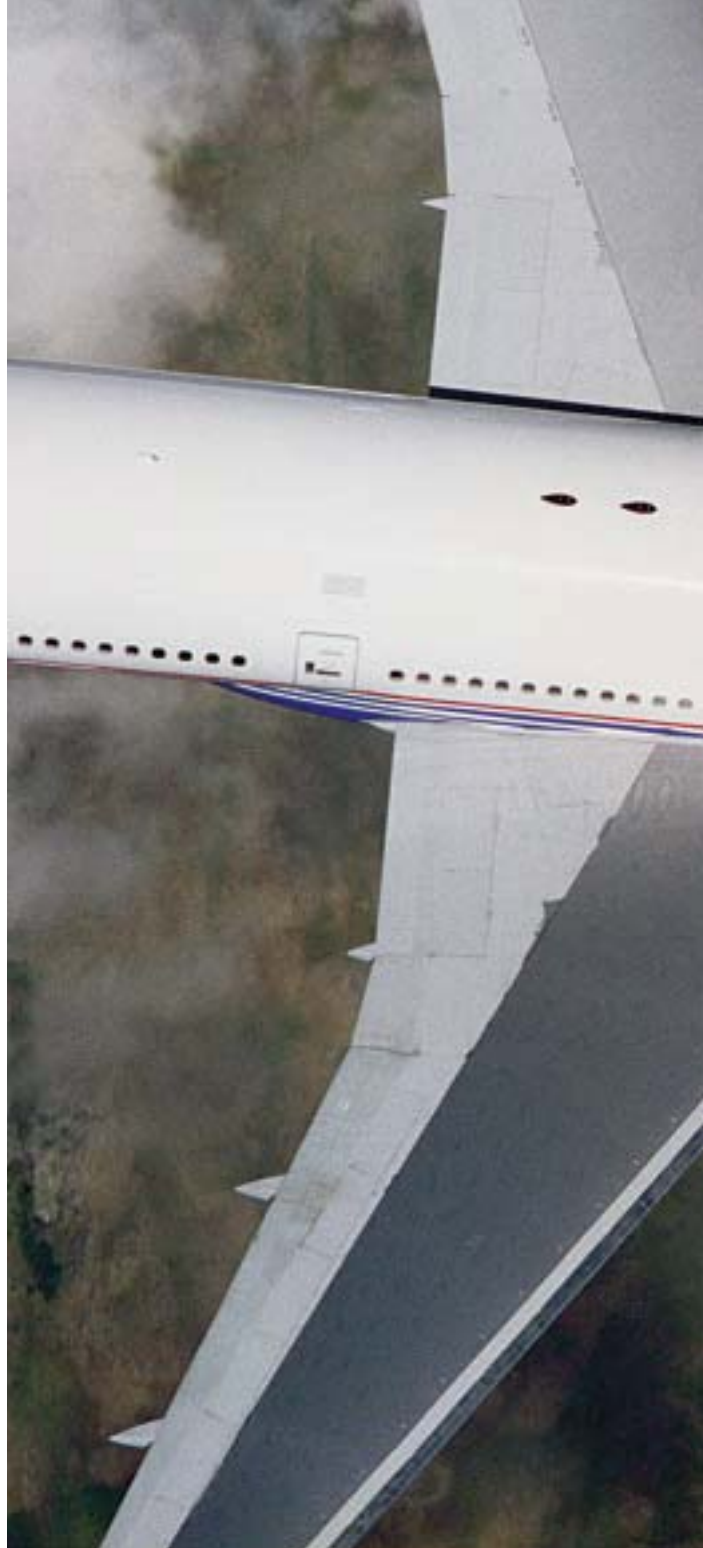
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TRADING, LEGAL & FINANCE: 777

Few large aircraft programmes have enjoyed the fairytale success of the 777. Over time, various airlines commented that the 747 was “too big” or that the 767-300ER was “too small”. So in the late 1980s, the industry welcomed the prospect of a new aircraft type that was – in true Goldilocks tradition – ‘just right’. But finding favour from airlines is not enough – they must win over the financial and investment community if they are to command good liquidity and value in the market. Simon Finn, SVP, aviation finance at DVB Bank gives his detailed financial analysis of the aircraft type.



FOR FINANCIERS OF COMMERCIAL AIRCRAFT, THERE ARE important differences between financing smaller, more prolific aircraft – such as the 737 or A320 Family – and larger, more expensive aircraft – like the A330, A340, A380, 747, 767, 787 and 777. The majority of airline routes are served using smaller jets as passengers are typically airborne for under two hours. Also, schedules are built around a frequency of service primarily designed to appeal to the business traveller, which dictates the use of smaller aircraft so load factors remain high enough to generate satisfactory yields. A notable exception is when serving high densities of traffic between two major destinations. Such city-pairs are best served using widebodied aircraft.

Ascend indicates that there are around 1,600 operators of today's 22,700 commercial aircraft. While over 17,000 are single-aisles operated by more than 1,400 operators, there are only 5,000 widebodied aircraft flown by fewer than 500 operators. Once subdivided by aircraft size, one might reasonably conclude that the market for widebodied aircraft is considerably less liquid as there are fewer remarketing opportunities.

The principal risk of financing such aircraft is that a default may occur. IATA believes that airlines worldwide lost \$9.9bn in 2009, made \$16bn in 2010, and will see this reduced to around \$8.6bn in 2011. As a result, it is generally perceived that the risk of airline default has diminished compared to two years ago.

It can be argued that widebodied aircraft operators have increasingly better credit, meaning there is less chance of default and more stability in aircraft values. However, the high capital cost, high transition costs and reduced remarketing opportunities associated with widebodied aircraft suggest that the severity of any default would be much greater for a single-aisle type. Appraisers' base and market values implicitly assume an aircraft in half-life maintenance condition is 'market-ready', but it is important that financiers and investors do not underestimate the up-front costs of maintenance and cabin reconfiguration required to achieve this 'market-ready' status. The value of the aircraft is one thing, but the value to the seller may slide by many millions of dollars because of these transition costs.

Competitive position

The 777 would become remarkable for being the first twin-engine aircraft capable of serving routes over 7,000nmi. However, Boeing had to compete with two major aircraft manufacturers – Airbus and McDonnell Douglas. All manufacturers believed the market needed an aircraft capable of seating around 300 passengers in three classes to replace and expand the market at that point served by the ageing DC-10 and L-1011 tri-jet.



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Airbus split the market into long-range and regional widebody offerings. The result was the A330-300 and A340, which shared the same fuselage cross-section as the preceding A300/A310 Family of widebodies. However, wing, systems and engines were all new, giving the new aircraft the range and efficiency required to enter the new market segment with the MD-11.

Airbus believed that twin-jet economics suited widebodies for flights that averaged 3,000 to 4,000nmi, a surprising conclusion given the consortium's A300/A310 development history. For the long-range market, Airbus selected a traditional four-engine solution. Hindsight suggests that this was not the optimal decision but it is easy to forget that airlines and regulators were unconvinced by the use of twin engine aircraft for long-range flights. Also, by choosing the CFM56-5C to power the A340, Airbus believed it had calculated a weight advantage over the twin-engine solution. However, the A340's climb performance and cruise speed would eventually prove to be a competitive disadvantage and four-engine

maintenance costs would also have their effect on the aircraft's operating economics.

Although Boeing's board had authorised the 777 programme in 1989, the competing aircraft had entered service while Boeing was still determining the design. Boeing had planned to deliver two variants of the initial 777 series, followed by a longer-range development. The first of the two variants was to supply what Boeing called the 'A market' and would replace DC-10-10 and L-1011-1 aircraft, as well as satisfy growth demand. The 'B market' demand would be for an A340 competitor in the long-range market. In the early 1990s, Boeing had already spoken publicly on the possibility of stretching its A market aircraft for its Asian customers. Unlike the competitors, the 777 would be an all-new design – new fuselage, new wings (offered with a folding wingtip option never selected by the airlines), new General Electric (GE), Pratt & Whitney (P&W), and Rolls-Royce powerplants and Boeing's first commercial implementation of a fly-by-wire flight control system.

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These features and the essential certification for Extended Twin Engine Operations (ETOPS) would make the 777 an expensive development programme but ultimately these decisions would reward Boeing with strong overall market share.

There is further competition. Airbus offers the A350XWB type. The -900 series will offer long-range capability for 314 passengers and the -1000 version will be smaller than the largest 777 series aircraft but with arguably better economics. Boeing has postulated another 787 series called the -10, which would be approximately the same size as the 777-200 Series and might also therefore, bleed market share away from the 777. In fact, given the considerable efficiencies of the new 787, even the smaller 787-9 may offer seat-mile costs that make it a competitor to the 777-200ER.

The 777-200

The 777-200A was the original name for the A market 777 offering, now known as the 777-200. It entered commercial service with United Airlines in June 1995. Boeing marketed this initial offering with either two-class seating for 375 passengers or three-class seating for 305 passengers. A variety of weight schedules was developed with the lowest schedule offering a maximum take-off weight (MTOW) of 506,000lb for a range of 4,100nmi and the highest MTOW of 535,000lb giving a range of up to 5,210nmi.

To date, relatively few 777-200 aircraft have been remarketed – a process that is further complicated by Boeing's decision to offer engines from all three major manufacturers on the initial 777 Family. The fleet of just 87 777-200 aircraft with only 12 operators would be a tough remarketing prospect but as operators of one original equipment manufacturers' (OEM) engines are usually unwilling to accommodate the expense of introducing a second OEM's product, sellers are left targeting a market that is split between the three OEMs, not all of which operate the same engine type. Otherwise, they may try to expand the operator base by attracting a new operator.

Boeing's 777-200 Increased Gross Weight (IGW) was envisaged to serve the B market and offer competition against the A340-300 and MD-11. If the design choices for the 777 may have hindered its success in the A market against the mid-range A330-300, the all-new wing, engines and fuselage seemed to lend a long-term advantage to the 777 once the long-range markets were the target.

Boeing presented an aircraft capable of seating 301 passengers in three classes. The IGW variants featured MTOWs ranging from 580,000lb to 632,500lb with corresponding variation in range from around 5,800nmi to 7,300nmi. Later developments of the 777 wing and structure led to further evolution of the weight schedules, until an ultimate MTOW of 656,000lb was offered, extending the range of the aircraft to over 7,700nmi. Boeing subsequently renamed all versions of the 777-200 featuring an MTOW of 580,000lb or more as the 777-200 Extended Range (ER). This enormous variation of weights and capabilities highlights the flexibility of the 777s design. The new weights also demanded more powerful engines to facilitate runway and aircraft climb-out performance.

Today, with most orders for the 777-200ER seemingly placed, Rolls-Royce appears to have won the engine OEM market share battle from GE, with P&W having the smallest share. Operating lessors were more confident of 777-200ER liquidity and BOC Aviation, GECAS and ILFC have all ordered the type over the course of its programme.

Very few MD-11 passenger aircraft are listed in the table above, as following the merger of McDonnell Douglas and Boeing, operators lost confidence in the type and market values collapsed. The majority of the MD-11 fleet was converted to freighters. From DVB's perspective, passenger configured MD-11s are the least liquid of the types shown. For all their efficiency and flexibility, remarketing of the 777-200ER suffers from the decision to offer a tri-source engine supply from each of the major manufacturers. This disadvantage must be weighed against the greater popularity and perceived efficiency of the 777-200ER fleet, of which few are stored and for which a small order backlog still exists.

Many banks have withdrawn from the sector and many that remain prefer to contemplate business on a credit basis. In better times, an asset-based lender would prefer to finance the 777-200ER than the A340-300, as many Airbus operators are thought to be examining fleet replacement plans. With fuel prices escalating, the economics of the 777-200ER make it less vulnerable to early retirement. Clearly, some care over the airframe-engine combination is advisable as there are so few operators. This will present something of a challenge for remarketing. Avoiding too much exposure to a single operator's large fleet is desirable.

The 777-300

In March 1993, Boeing was rumoured to be in talks with Cathay Pacific to switch some of its orders from the shorter A market 777-200 to a new larger or stretched 777. Boeing was thought to have held further discussions with ANA, JAL and Thai Airways International. The talks resulted in the launch of the 777-300 Series featuring a fuselage stretch that increased the marketed three-class seating capacity to 368 passengers or 451 passengers in a two-class layout. A commensurate increase in belly hold cargo also came, which pushed the maximum optional MTOW to 660,000lb giving the -300 a range of just over 6,000nmi. As with the shorter -200 Series, all three engine OEMs offered power for the 777-300 but, airlines selected only the PW4098 and Trent 895, deeming the GE90 unsuitable.

The precedents for high-capacity regional aircraft are mostly from the Asian market. It was unlikely that the 777-300 would attract broad market acceptance, nor did it. Today, just seven airlines (all operating into Asia) carry the small global population of 60 777-300s. Ascend data shows that ILFC, BOC Aviation and Pembroke collectively own eleven Rolls-Royce-powered 777-300 aircraft. While the specifics of the transactions are not known, it is unlikely that there is significant residual value risk for the lessors who, rather like a bank, are likely to rely on the credit of the lessee and the integrity of the long-term lease revenue.

The 777-300 is unusually difficult for its small operator base to replace. The niche nature of high-capacity regional services does not encourage manufacturers to build aircraft specifically for such range and 'misusing' long-range aircraft is theoretically unattractive as operating costs are sub-optimal for the airlines. While harbouring no illusions regarding the liquidity or resale value of the 777-300 fleet, it seems the aircraft remains financeable largely due to its airline operators. Without this, the aircraft would rely on its asset characteristics alone and as the market indicates, these are not sufficient to qualify the 777-300 for pure asset-based finance. Finally, while it has been possible to compare other 777s with competitors on the basis of relative seat-mile costs, comparable seat capacity and range capability, when measured in this way, the 777-300 has no competition.

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In June 1999, Boeing announced it was studying longer range derivatives of the 777 and on February 29, 2000 the board approved the launch. To achieve the additional range, the aircraft would feature aerodynamic improvements in the form of 6.5ft raked wingtips to reduce takeoff field length, increase climb performance and reduce fuel burn. A new and improved gear was required to cope with the heavier weight schedules and a semi-levered gear would enable the 777-300ER to takeoff from fields with a limited runway length. In a departure from its previous position on the 777 Family, Boeing gave GE sole engine supplier status on the second generation aircraft, upsetting airlines that had selected P&W or Rolls-Royce on first generation versions but gaining a formidable risk-sharing partner for the longer-range 777 programme. For its part, GE developed a new version of its GE90 able to supply either 110,100lb or 115,300lb thrust depending on airframe requirements.

The first of this new generation, the 777-300ER entered service with Air France on April 29, 2004. The 777-300ER offers a three-class seating capacity of 365 passengers and a range of up to 6,240nmi for the basic version and up to 7,930nmi for the version with the maximum optional weight schedule.



It seems overly generous, based on today's data, to describe the comparison as competition. One unkind (and unnamed) commentator was moved to describe the A340-600 as "road-kill". While undoubtedly harsh, it is hard to deny the dominance of the 777-300ER. The picture may change given the A350XWB programme and the undefined nature of the A350-1000. However, Boeing and GE have worked hard to achieve this dominance and are likely to introduce ongoing improvements to maintain the competitiveness of the 777-300ER. Without the complication of a multi-source engine supply, the 777-300ER has much greater remarketing potential than any preceding 777 Family member and thanks to a significant fuel burn advantage over the A340-600, its sales volume has been sufficiently robust to suggest better-than-average residual value retention going forward. As well as depth, the 777-300ER market is also broad with 34 operators having this version either in service or on order. With 101 777-300ER orders, Emirates' fleet concentration may be an issue for financiers. Some caution over advance levels may also be advisable, as pricing seems to have been highly variable depending on the nature of customers and their orders activity.

The 777-200LR

The 777-200 Long-range (LR) is marketed by Boeing with a three class seat capacity of 301 passengers and a range of up to 8,240nmi for the basic version and up to 9,450nmi for the version with the maximum optional weight schedule. The 777-200LR entered commercial service with Pakistan International Airlines in February 2006.

Perhaps it pales in contrast to the larger 777-300ER but somehow the orderbook for the 777-200LR variant disappoints. The payload/range performance results from incorporating the structural changes made for the -300ER to the shorter airframe of the -200 Series. But unsurprisingly, airlines were already pleased with the performance of the very flexible -200ER and while many did not feel the need for the additional range or belly-freight payload advantage of the -200LR, relatively few routes demanded the performance of the new 777-200LR. Using the -200LR on routes that can also be served using the -200ER is another 'no-no' as the LR's extra structure and weight mean that the -200ER may be more economical.

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Another complication is that more routes support use of the larger 777-300ER and as long-range routes offer limited opportunity for frequency (airport slot timing is often key), demand for the -200LR looks likely to remain constrained. Airbus' competitor offering – the A340-500 – found a similar indifference for ultra-long-range capability but also suffered more noticeably in the financial crisis as some airlines cancelled orders or realised that their requirement for the A340-500 no longer remained. Neither of these is easy to finance on the basis of the asset alone but the A340-500 suffers from four-engine economics in an increasingly environmentally conscious world, whereas the 777-200LR benefits from its association with the overall success of the twin-engine 777 Family. As with the A market versions of the original 777 Family, the 777-200LR is not considered suitable for pure asset-based finance but may be considered in combination with an appropriate airline/lessor credit. Further pressure will come from the A350-900 and 787-9 which are expected to offer seat-mile costs that will be very competitive for the -200LR. Lastly, the 777-200LR may have

more potential for a life-extending role-change to cargo usage in the future provided that market appetite for conversions does not dwindle in the long-term and provided Boeing's conversion costs can be economically attractive.

The A market 777s are an entirely different proposition. These aircraft are generally not suited to pure asset-based finance as they rely on strong market conditions for their liquidity and value. In a weak market, the aircraft's ongoing appeal to investors and financiers is largely dependent on the creditworthiness of the counterparty. The smaller quantity of A market 777 sales, condensed over a shorter period also suggests that the A market versions will have a shorter serviceable life than the more popular and long-range versions. As the quality of the operator base is so crucial to maintaining widebodied aircraft values, the older average age of the A market fleet is already prompting some of the original operators to divest numbers of these aircraft from their fleets. The resulting value volatility may well reduce the level of advance in financings and prompt more conservative residual value assumptions for lower balloon positions at the end of the loan term.

So thanks to the 777-300ER in particular, the 777 Family's fairytale continues and while dark murmurings about the possible impact of the A350-1000 have begun, whether or not the fairytale eventually becomes 'Grimm' will depend on Boeing's ability to protect the Family with technological advancements and by ensuring that the 777-300ER and future derivatives maintain their competitiveness. For today's long-range markets though, the 777-300ER blend of range and capacity remains 'just right' and the aircraft is a firm favourite with financiers of larger aircraft.

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