Morgan Stanley

MORGAN STANLEY RESEARCH
EUROPE

Morgan Stanley & Co. International Limited

Scott Babka, CFA
Scott.Babka@morganstanley.com
+44 (0)20 7425 8750

September 5, 2006

Stock Rating
Overweight

Industry View
In-Line

EADS

The A380 Debate

A380 success or failure – that's the €10 billion question for EADS shareholders. In our base case, which assumes 30 A380 deliveries/year, we peg Airbus' value at €18.5bn. Based on one expert's outlook, this figure rises to €23.7bn; based on another's, it falls to €14.6bn. In our view, EADS shares are already discounting in the A380 bear-case, but offer 60% upside if the super-jumbo is a success. Among suppliers, Goodrich, Rolls Royce, and Safran are most levered to the A380's success.

Two experts state their case for and against the A380. In our view, the current A380 production delays are obfuscating the most important question investors must ask when considering an investment in EADS–will the 555-seat super jumbo be a long-term commercial success? Given the A380's importance, and the widespread disagreement on the matter, we have asked two noted experts – with diametrically opposite views on the subject – to explain why they think the aircraft will, or will not be, a financial success.

Philip Lawrence sees demographic trends and superior technology driving the success of the A380. He argues that rapid urbanisation in Asia, coupled with the rise of a new middle class, is fueling strong demand for air travel between the world's growing mega-cities. The airports at these cities are getting increasingly congested, and he thinks the A380 can provide much-needed relief. He expects the super-jumbo to dominate Boeing's 747-8, which he argues is based on old technology. He expects Airbus to deliver 380 A380s by 2015, with another 500 by 2025.

Richard Aboulafia believes the A380 is a tremendously expensive way to address a small and shrinking market. Given the A380's excessive weight, he thinks it can be operated profitably on only a small number of routes. He thinks demand for international travel will be better served by Boeing's two-engine 777 and 787, and Airbus's A350XWB family. He expects Airbus to deliver only 200 A380s by 2015, with another 200 by 2025.

Key Ratios and Statistics

Reuters: EAD.PA Bloomberg: EADS NA
Aerospace & Defence / France

Price target	**€30.00**
Shr price, close (Sep 4, 2006)	€23.08
Mkt cap, curr (mn)	€18,464
52-Week Range	€35.42-16.75

Fiscal Year (Dec)	**2005**	**2006e**	**2007e**	**2008e**
ModelWare EPS (€)*	**1.73**	**1.94**	**2.39**	**2.50**
P/E	**18.4**	**11.9**	**9.7**	**9.2**
Consensus EPS (€)	**1.91**	**2.21**	**2.39**	**2.59**
Div yld (%)	2.1	3.0	3.1	3.3

* = Please see explanation of Morgan Stanley ModelWare later in this note.
e = Morgan Stanley Research estimates

Investment Case

The A380 Debate–Two Experts State Their Case

The A380 aircraft is arguably the highest profile and most expensive industrial product launch in history. In our view, the recently announced production delays are obfuscating the most important question investors must ask when considering an investment in EADS: will the 555-seat super-jumbo be a financial success over the next 20+ years? While the current delays do affect Airbus' near-term earnings, it is this aircraft's ability to secure a steady stream of demand, with improved pricing and reduced production costs, that will have the most significant impact on Airbus' long-term earnings power, as well as that of scores of aerospace suppliers that have invested heavily in the A380's development.

Given the A380's importance, and widespread disagreement within industry and the financial community on the programme, we have asked two noted experts (who have diametrically opposed views on the subject) to argue why they believe the A380 will or will not be a commercial success. It is our intention is to allow you, the investor, to evaluate the experts' arguments and form your own conclusion. We are, however, confident in our outlook for 30 A380 deliveries per year and a gradual improvement in A380 operating margins, which supports our €30 price target for EADS. Further, it is our view that the stock is already pricing in the bear-case for the A380, and offers up to 60% upside if it proves to be more of a financial success than we forecast. This supports our Overweight rating on the stock.

- In support of the A380 is **Professor Philip Lawrence**, Director of the Aerospace Research Centre at UWE, Bristol. He is an aerospace/defence consultant and adviser to a number of European governments and prime companies, who has written eight books on security, defence and aerospace issues, and is a fellow of the Royal Aerospace Society, the Royal Society of Arts and the NATO Atlantic Council. He holds a Ph.D. in Economics, as well as Master's degrees in Political Science and Aerospace Engineering. He argues that rapid urbanisation in Asia, coupled with the rise of a new middle class is fueling strong demand for air travel between the world's growing mega-cities. The airports in these cities are becoming increasingly congested, and he sees the A380 providing much-needed relief. He expects it to dominate Boeing's 747-8, which he argues is based on old technology. Prof. Lawrence expects Airbus to deliver 380 A380s through 2015 with an additional 500 from 2016-2025, and benefit from improved pricing and reduced manufacturing costs as production rates rise.

- Arguing the opposite position is **Mr. Richard Aboulafia**, Vice President of Analysis for the Teal Group. He writes and edits Teal Group's World Military and Civil Aircraft Briefing, a forecasting tool covering over 135 aircraft programs and markets, and serves as an advisor to numerous aerospace companies. He has a Masters degree in War Studies from King's College, University of London and a Bachelors degree from George Washington University. Mr. Aboulafia thinks the A380 is a tremendously expensive way to address a market that's small and shrinking. Given the A380's excessive weight and modest technological advances, he thinks it can be operated profitably on only a small number of routes, and believes it will face stiff competition from the 747-8 in the freighter, and potentially passenger, market. He thinks demand for international passenger travel will be better served by Boeing's two-engine 777 and 787, as well as Airbus' own A350XWB family. Even with significant required improvements, such as a stretched A380–900 version to carry 650/700 passengers, Mr. Aboulafia expects Airbus to deliver only 200 A380s through 2015, with an additional 200 from 2016-2025.

EADS shares are probably fairly valued if Mr. Aboulafia is right, but there is 60% upside if the A380 is as successful as Prof. Lawrence expects.

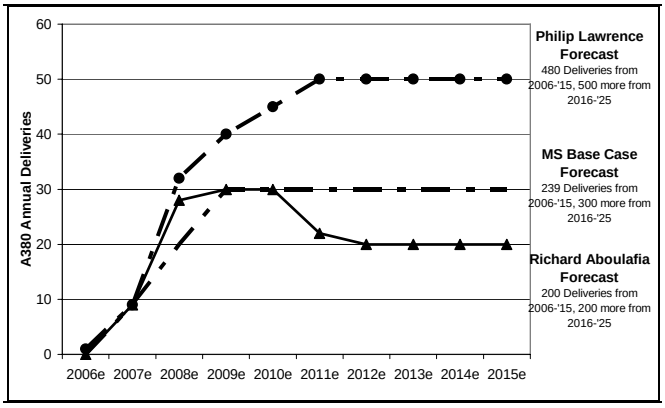
A380 success or failure – that's the €10 billion question for EADS shareholders. The scenarios outlined by our experts would result in dramatically different outcomes for Airbus earnings. To calculate what is at stake, we've plugged each of their estimates for A380 deliveries, as well as their broad expectations for pricing, production costs and further development expenditures into our base case assumptions (see exhibits 11-13). On this hypothetical basis (assuming a long-term USD/EUR rate of 1.30), we arrive at a valuation for Airbus ranging from a low of €14.6 billion to a high of €23.7 billion. Please note that this valuation analysis and earnings forecasts reflect our application of the

scenarios outlined by Professor Lawrence and Mr. Aboulafia, and not their specific earnings forecasts.

As outlined in exhibit 3, our base case price target for EADS, which currently stands at €30, would fall to a low of €25 or rise to €36 depending on which view one takes on the A380. Accordingly, with the stock currently trading at €23-24 (and using our base valuation for the rest of Airbus and EADS defence operations), the stock has already priced in the gloomy outlook for A380 demand articulated by Mr Aboulafia, yet offers 60% upside if Prof. Lawrence proves correct.

Exhibit 1

Our Two Experts Outline Strongly Opposing Outlooks for A380 Deliveries



Source: Company data, Morgan Stanley Research, E= Morgan Stanley Research Estimates

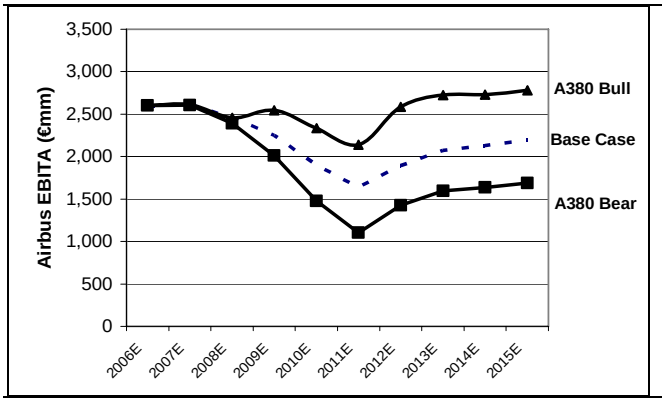
In our base case, we estimate that Airbus is worth €18.5 billion (7.1x 2007e EBITA), based on our terminal (2015e) assumption of €28.3 billion in revenue and €2.2 billion in EBITA, equivalent to a 7.8% terminal EBITA margin. As pricing improves and unit production costs decline, we assume A380 revenues migrate to an incremental EBITA margin of roughly 15% (calculated before unallocated R&D and G&A costs). On this basis, we estimate the A380 contributes €650-700 million in annual EBITA, or roughly 30% of Airbus' total.

If the A380 is successful as Prof Lawrence expects, our base case terminal earnings forecast and FMV for Airbus would prove €5.1 billion (28%) too low, which is worth an additional €6.50 per EADS share. In this scenario, we assume Airbus delivers 50 A380s per year. We assume that strong demand limits discounting and allows Airbus to reduce unit production costs further, which drives A380 incremental EBITA margin up to 18%. The combination of higher deliveries and higher margins drives the A380's annual profit contribution up to €1.3 billion, which pushes Airbus total EBITA up to €2.7-2.8 billion, for a 14% uplift in our long-term EADS consolidated EBITA forecasts.

If demand for the A380 is as muted as Mr. Aboulafia expects, our valuation of Airbus would prove €4.0 billion (27%) too high, which would cause a €5.00 fall in the fair value of EADS shares. In this scenario, we assume Airbus delivers 20 A380s per year, and that weak pricing, higher unit production costs, and further development costs for new derivatives drive the A380's incremental EBITA margin down to 7%. The combination of lower deliveries and weaker margins drives Airbus annual EBITA down to €1.6-1.7 billion, for an 11% fall in our long-term EADS EBITA forecasts.

Exhibit 2

Our Airbus EBITA Outlook Varies Materially Based on What Stance One Takes on the A380. . .



Source: Company data, Morgan Stanley Research, E= Morgan Stanley Research Estimates

Exhibit 3

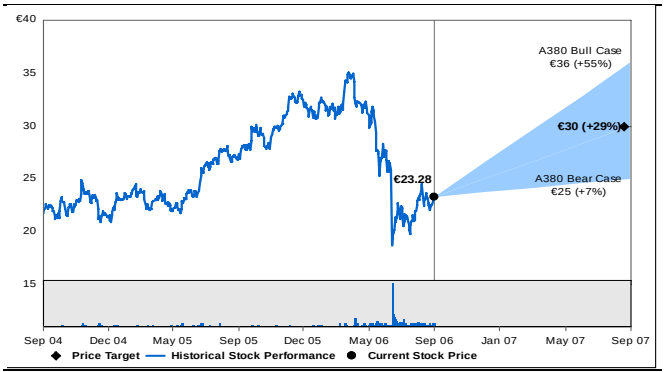
. . .Which Drives a Significant Deviation in the Fair Value of EADS Shares

(in millions €)	EADS FMV/share	DCF-derived Airbus FMV	EV/Revenue 2007e	EV/Revenue 2008e	EV/EBITA 2007e	EV/EBITA 2008e
Bear	€25	14,581	0.6x	0.5x	5.6x	6.1x
Base	€30	18,544	0.7x	0.7x	7.1x	7.5x
Bull	€36	23,686	0.9x	0.8x	9.0x	9.2x

Source: Company data, Morgan Stanley Research, E= Morgan Stanley Research Estimates

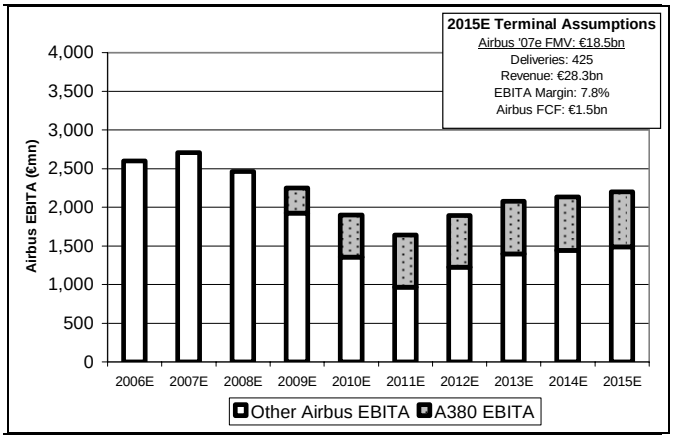
Exhibit 4

EADS FMV of €30 Rises to €36 on Prof. Lawrence's A380 Outlook and Falls to €25 on Mr. Aboulafia's



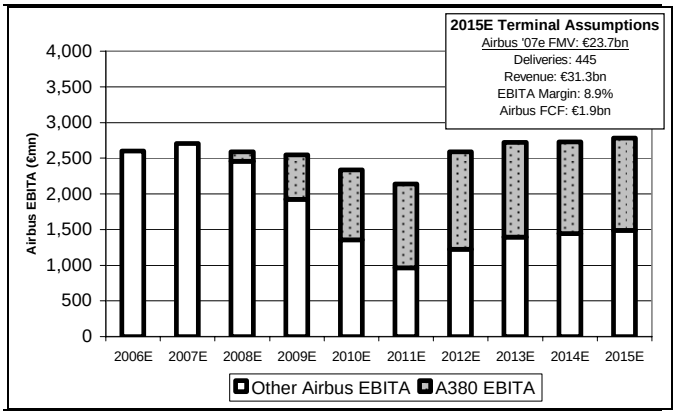
Source: Company data, Morgan Stanley Research

Exhibit 5
MS Airbus EBITA Forecast–Base Case



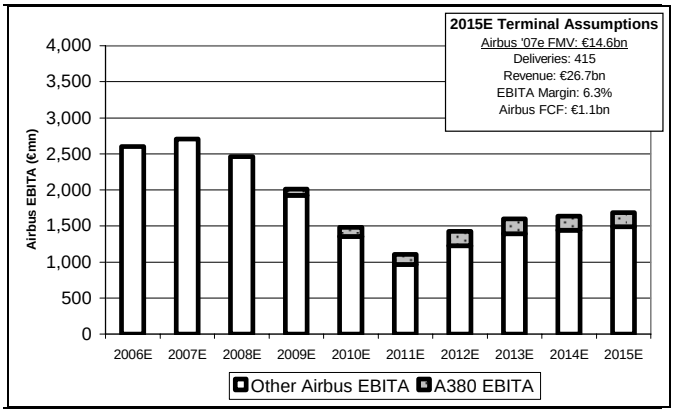
Source: Company data, Morgan Stanley Research E= Morgan Stanley Research Estimates

Exhibit 6
MS Airbus EBITA Forecast–Based on Philip Lawrence's A380 Demand Outlook



Source: Company data, Morgan Stanley Research E= Morgan Stanley Research Estimates

Exhibit 7
MS Airbus EBITA Forecast–Based on Richard Aboulafia's A380 Demand Outlook



Source: Company data, Morgan Stanley Research E= Morgan Stanley Research Estimates

The A380 programme will also have a significant impact on other companies in the aerospace supply chain. In exhibit 8, we outline the revenue and earnings sensitivity of the A380's major suppliers to A380 delivery forecasts outlined by our two experts. We estimate Rolls Royce has the highest absolute exposure to the A380 because of its decision to develop the Trent 900 engine on its own. Assuming the Trent 900 captures 50% of future deliveries, Rolls Royce should generate roughly US$1.1 billion (£600 million) in annual revenue related to A380 engine sales and associated spare parts. This figure could reach as high as US$1.8 billion (£1.0 billion) if deliveries are in line with Prof. Lawrence's expectations, yet fall to US$700 million (£400 million) if demand is as modest as Mr. Aboulafia suggests. In exhibit 9, we've ranked the approximate earnings sensitivity of each suppliers to the two outlooks for A380 deliveries. On this basis, (which takes into account each the supplier's revenue and profit base relative to its A380 exposure), Goodrich has most at stake (with a 5% profit uplift in the bull case) followed by Rolls Royce, Safran, and MTU.

In deriving each company's relative exposure to future A380 deliveries, we have estimated the average value of equipment supplied on each A380. We gross this up to take into account after-market revenue, which is highest for engine manufactures such as Rolls Royce and MTU and lowest for electronic systems providers such as Rockwell Collins and Thales. To calculate each suppliers' EBITA sensitivity to the A380, we've assumed an incremental EBITA margin of 15% for systems suppliers and 10% for engine suppliers (the lower margin for engine suppliers is because profits are entirely weighted in the aftermarket, which will not build until the A380's installed base grows).

Company Description

EADS is the largest diversified aerospace and defence company in Europe. 60% of revenues are contributed by Airbus, which, together with Boeing, shares the market for aircraft of more than 100 seats. Defence revenues are growing as key programmes are moving into production.

Industry View: In-Line

GICS Sector: Industrials

Strategists' Recommended Weight: 7.7%
MSCI Europe Weight: 8.3%

Exhibit 8

Major Suppliers Exposure to the A380

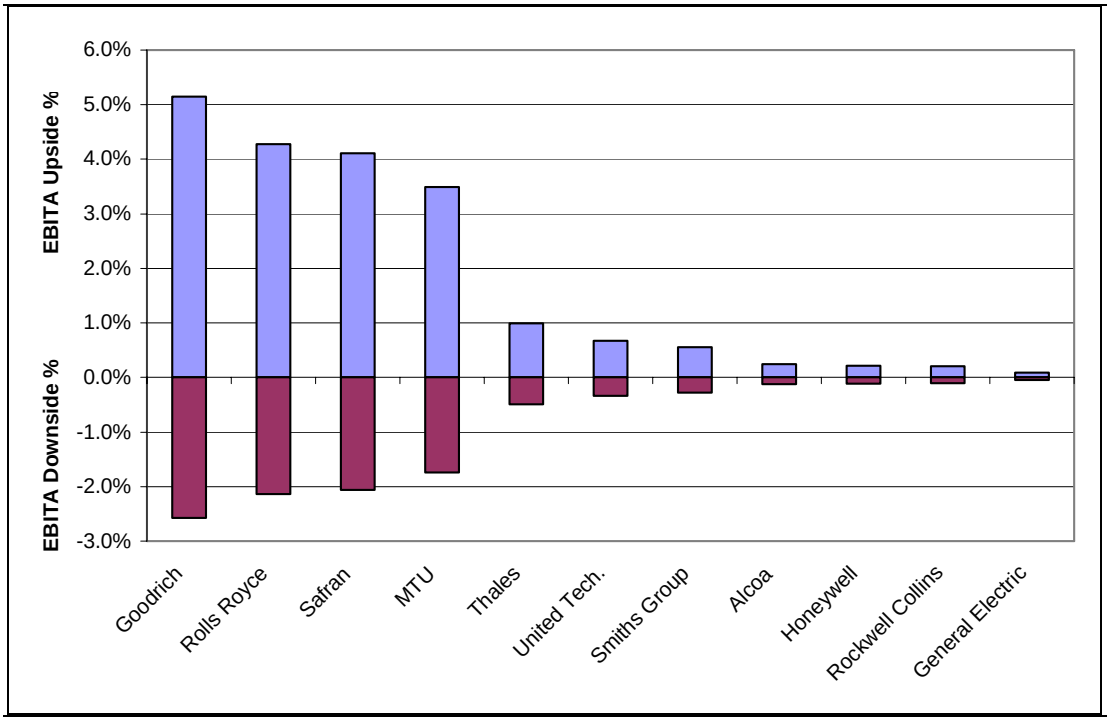
Company	Major Components Supplied	Est. Shipset Value per A380 (USD mm)	After-market Multiplier	Value Including After-market	Annual A380 Revenue			A380 A380 EBIT*			% Impact on Consol. Revenue		% Impact on Consol. EBIT	
					Bull	Base	Bear	Bull	Base	Bear	Bull	Bear	Bull	Bear
Rolls Royce	Trent 900 engine **	18.0	100%	36.0	1,800	1,080	720	180	108	72	4.5%	-2.3%	4.3%	-2.1%
Safran	Nacelles, braking controls, nose landing gear, comm. & data systems; 10% share of GP7200 engine	15.0	50%	22.5	1,125	675	450	158	95	63	2.5%	-1.2%	4.1%	-2.1%
United Technologies	APU (Auxiliary Power Unit), air conditioning system; GP7200 engine (JV with GE)	10.0	80%	18.0	900	540	360	135	81	54	0.7%	-0.3%	0.7%	-0.3%
General Electric	GP7200 engine (JV with Pratt & Whitney) **	9.0	100%	18.0	900	540	360	90	54	36	0.2%	-0.1%	0.1%	0.0%
Goodrich	Landing gear, fight control systems, evacuation systems, cargo loading, aerostructures, engine components	8.0	50%	12.0	600	360	240	90	54	36	3.4%	-1.7%	5.1%	-2.6%
Finmeccanica	4% share of airframe production; air conditioning, humidifaction, insulation systems	5.0	10%	5.5	275	165	110	41	25	17	0.6%	-0.3%	1.1%	-0.5%
Alcoa	Aluminium, fasteners, fuselage sections, fuselage stringers and skins, support structures, fittings	3.5	25%	4.4	219	131	88	33	20	13	0.3%	-0.1%	0.2%	-0.1%
Thales	Cockpit control and displays, In Flight Entertainment (IFE) system, radio altimeter	3.5	25%	4.4	219	131	88	33	20	13	0.5%	-0.2%	1.0%	-0.5%
MTU	22.5% share of GP7200 engine	3.2	100%	6.5	324	194	130	32	19	13	3.4%	-1.7%	3.5%	-1.7%
Honeywell	Flight management system, SATCOM, navigation systems, wheels & brakes	2.5	25%	3.1	156	94	63	23	14	9	0.2%	-0.1%	0.2%	-0.1%
Smiths Group	Actuation, landing gear systems, fabrications	1.5	50%	2.3	113	68	45	17	10	7	0.6%	-0.3%	0.6%	-0.3%
Rockwell Collins	Avionics & navigation equipment, communications infrastructure	0.5	25%	0.6	31	19	13	5	3	2	0.2%	-0.1%	0.2%	-0.1%

** At 15% assumed incremental margin for equipment and components, and 10% for aero engines suppliers.*
*** Assume 50-50 split of engine deliveries to Rolls Royce (Trent 900) and Engine Alliance (GP7200)*

Source: Company data, Morgan Stanley Research

Exhibit 9

Long-term EBITA Sensitivity of Major Suppliers to the A380 Bear and Bull Cases



Source: Company data, Morgan Stanley Research

EADS investment thesis and valuation methodology
Our price target for EADS based on long-term DCF analysis, (which assumes an 8.6% WACC and 2.0-2.5% long-term growth rate), cross-checked by long-term P/FCF valuation analysis. Our 2007e DCF-derived FMV of €31.50 assumes an €18.5 billion valuation for Airbus (which implies a 7.5x 2008e EV/EBITA multiple), in the middle of the €14.6 billion to €23.7 billion range we estimate based on our two experts' outlooks. We then add €10.2 billion for EADS' consolidated defence and space assets (10.0x implied 2008e EV/EBITA) and €2.6 billion for unconsolidated assets. We then deduct €3.0 billion of net debt and pension liabilities, and €3.0 billion of minority interests (related to Airbus and MBDA) to arrive at an equity value of €25.3 billion, or €31.50 per share. As a cross check, we also forecast EADS consolidated FCF/share out to 2012, apply a terminal 16x FCF multiple and discount this value back to the present at a 10% required return on equity. This analysis supports a 2007E fair value of €29.31. The average of both methodologies supports our €30 target.

As our valuation analysis shows, we see considerable upside to fair value in the value the market ascribes to both Airbus and EADS defence portfolio. Even if Mr. Aboulafia's dire predictions for the A380 prove accurate, we see modest upside to fair market value. Specifically, we believe there are five things EADS new management can do to drive the stock toward its intrinsic value: 1) Complete the A380 test programme and articulate a recovery plan to confirm that management's revised delivery schedule is realistic; 2) Proceed with the industrial launch of the new A350XWB in mid-October after locking in at least three launch customers; 3) Continue to lock in additional orders for its current wide-body product offering (primarily A330s); 4) Outline details of further cost savings plan to sustain margins if the EUR/USD remains at 1.35 or higher; 5) Demonstrate continued growth in defence profits, through steady margin expansion, continued milestone completion on the A400M, and additional export wins in the US and Europe.

There are several risks to our long-term estimates and price target. Our forecasts assume a long-term EUR/USD rate of 1.30; a move to 1.35, without any additional cost savings, would cut our forecasts and fair value estimate by 10%. In addition, it is possible that the Airbus A350XWB is delayed beyond its 2012 expected entry into service, and is unable to capture sufficient share (at least 40%) relative to the Boeing 777 and 787 offering. Finally, cost overruns on major programmes (such as A400M), as well as stagnant margin expansion across Eurocopter and Space could limit the value we ascribe to the rest of the EADS portfolio.

Exhibit 10

EADS Consolidated Operating Forecast Sensitivity to A380 Outlook

(in millions €)	2006e	2007e	2008e	2009e	2010e	2011e	2012e
EADS Consolidated							
Revenue	37,767	38,702	41,370	43,053	42,918	42,812	43,495
EBITA (ex. associates)	2,999	3,442	3,453	3,316	3,016	2,793	3,083
EPS	1.94	2.39	2.50	2.50	2.41	2.34	2.64
FCF/share	0.59	1.10	2.06	2.27	1.84	2.00	2.39
A380 Bear Case							
Revenue	37,767	38,702	42,219	42,867	41,620	41,215	41,963
EBITA (ex. associates)	2,999	3,435	3,384	3,082	2,594	2,256	2,618
EPS	1.94	2.38	2.45	2.32	2.07	1.90	2.26
FCF/share	0.59	1.07	2.06	2.12	1.63	1.82	2.01
% Deviation from Base Case							
Revenue (%)	*0*	*0*	*2*	*0*	*-3*	*-4*	*-4*
EBITA (%)	*0*	*0*	*-2*	*-7*	*-14*	*-19*	*-15*
A380 Bull Case							
Revenue	37,882	38,720	42,815	45,011	45,418	45,697	46,642
EBITA (ex. associates)	2,999	3,458	3,581	3,617	3,453	3,291	3,780
EPS	1.94	2.40	2.60	2.74	2.75	2.73	3.19
FCF/share	0.54	1.04	2.19	2.55	2.36	2.71	3.01
% Deviation from Base Case							
Revenue (%)	*0*	*0*	*3*	*5*	*6*	*7*	*7*
EBITA (%)	*0*	*0*	*4*	*9*	*15*	*18*	*23*

Source: Company data, Morgan Stanley Research e= Morgan Stanley Research Estimates

Exhibit 11

A380 Forecast and Airbus Valuation–Base Case

(in millions €)	2006e	2007e	2008e	2009e	2010e	2011e	2012e	2013e	2014e	2015e
Airbus A380 Deliveries	-	9	20	30	30	30	30	30	30	30
Revenue/Delivery	NA	111	120	131	140	145	147	150	152	154
Assumed Discount to List (%)	NA	45	41	37	34	32	32	32	32	32
A380 Revenue	**-**	**995**	**2,408**	**3,916**	**4,195**	**4,354**	**4,419**	**4,486**	**4,553**	**4,621**
A380 Direct Production Costs per A380	NA	113	114	112	112	112	114	115	117	118
A380 Production Costs	-	1,013	2,275	3,374	3,366	3,367	3,410	3,453	3,497	3,542
A380 Contribution Margin %	-	*-2*	*6*	*14*	*20*	*23*	*23*	*23*	*23*	*23*
A380 Direct R&D, Depreciation & Fixed Costs	-	73	134	218	283	311	341	353	366	369
A380 EBITA Contribution	**-**	**(91)**	**(0)**	**324**	**546**	**676**	**669**	**680**	**689**	**710**
*A380 EBITA Margin (%)**	-	*-9%*	*0*	*8*	*13*	*16*	*15*	*15*	*15*	*15*
Airbus Total Revenue	25,101	25,224	26,920	27,998	27,340	26,833	27,114	27,713	28,208	28,297
Airbus Total EBITA	2,601	2,612	2,460	2,246	1,899	1,639	1,892	2,075	2,131	2,198
Margin (%)	*10.4*	*10.4*	*9.1*	*8.0*	*6.9*	*6.1*	*7.0*	*7.5*	*7.6*	*7.8*
Airbus Total Free Cash Flow	885	1,170	1,189	1,202	954	892	1,258	1,376	1,412	1,456
Airbus Fair Value	**18,544**									
Implied EV/Revenue Multiple	0.7x	0.7x	0.7x							
Implied EV/EBITA Multiple	7.1x	7.1x	7.5x							

Source: Company data, Morgan Stanley Research
e= Morgan Stanley Research Estimates
* Before unallocated R&D and overhead costs

Exhibit 12

A380 Forecast & Airbus Valuation Based on Philip Lawrence's A380 Demand Outlook

(in millions €)	2006e	2007e	2008e	2009e	2010e	2011e	2012e	2013e	2014e	2015e
Airbus A380 Deliveries	1	9	32	45	48	50	50	49	48	48
Revenue/Delivery	115	113	120	131	140	145	152	154	156	159
Assumed Discount to List (%)	45	44	41	37	34	32	30	30	30	30
A380 Revenue	**115**	**1,014**	**3,854**	**5,873**	**6,712**	**7,257**	**7,582**	**7,542**	**7,499**	**7,611**
A380 Direct Production Costs per A380	114	110	108	108	108	110	111	112	114	115
A380 Production Costs	114	990	3,469	4,841	5,202	5,481	5,550	5,508	5,465	5,534
A380 Contribution Margin %	0	2	10	18	22	24	27	27	27	27
A380 Direct R&D, Depreciation & Fixed Costs	1	99	257	408	527	602	666	705	747	782
A380 EBITA Contribution	**-**	**(75)**	**128**	**624**	**983**	**1,174**	**1,366**	**1,329**	**1,287**	**1,296**
*A380 EBITA Margin (%)**	-	*-7*	*3*	*11*	*15*	*16*	*18*	*18*	*17*	*17*
Airbus Total Revenue	25,216	25,242	28,365	29,956	29,839	29,718	30,261	30,754	31,138	31,271
Airbus Total EBITA	2,601	2,628	2,587	2,547	2,337	2,138	2,589	2,724	2,730	2,784
Margin (%)	10.3	10.4	9.1	8.5	7.8	7.2	8.6	8.9	8.8	8.9
Airbus Total Free Cash Flow	847	1,119	1,290	1,423	1,370	1,452	1,746	1,831	1,833	1,868
Airbus Fair Value	**23,686**									
Implied EV/Revenue Multiple	0.9x	0.9x	0.8x							
Implied EV/EBITA Multiple	9.1x	9.0x	9.2x							

Source: Company data, Morgan Stanley Research
e= Morgan Stanley Research Estimates
* Before unallocated R&D and overhead costs.

Exhibit 13

A380 Forecast & Airbus Valuation Based on Richard Aboulafia's A380 Demand Outlook

(in millions €)	2006e	2007e	2008e	2009e	2010e	2011e	2012e	2013e	2014e	2015e
Airbus A380 Deliveries	-	9	28	30	22	20	20	20	20	20
Revenue/Delivery	NA	111	116	124	132	139	145	147	150	152
Assumed Discount to List (%)	NA	45	43	40	37	35	33	33	33	33
A380 Revenue	**-**	**995**	**3,258**	**3,729**	**2,914**	**2,775**	**2,903**	**2,946**	**2,991**	**3,035**
A380 Direct Production Costs per A380	NA	111	111	110	110	112	113	114	115	117
A380 Production Costs	-	995	3,094	3,304	2,427	2,232	2,257	2,283	2,309	2,335
A380 Contribution Margin %	-	0	5	11	17	20	22	23	23	23
A380 Direct R&D, Depreciation & Fixed Costs	-	98	232	335	363	403	443	461	487	503
A380 EBITA Contribution	**-**	**(98)**	**(69)**	**90**	**124**	**140**	**203**	**203**	**195**	**198**
*A380 EBITA Margin (%)**		*-10*	*-2*	*2*	*4*	*5*	*7*	*7*	*7*	*7*
Airbus Total Revenue	25,101	25,224	27,769	27,811	26,042	25,236	25,582	26,158	26,630	26,695
Airbus Total EBITA	2,601	2,605	2,391	2,013	1,478	1,103	1,426	1,598	1,637	1,686
Margin (%)	*10.4*	*10.3*	*8.6*	*7.2*	*5.7*	*4.4*	*5.6*	*6.1*	*6.1*	*6.3*
Airbus Total Free Cash Flow	885	1,141	1,190	1,079	791	751	963	1,073	1,100	1,132
Airbus 2007e Fair Value	**14,581**									
Implied EV/Revenue Multiple	0.6x	0.6x	0.5x							
Implied EV/EBITA Multiple	5.6x	5.6x	6.1x							

Source: Company data, Morgan Stanley Research
e= Morgan Stanley Research Estimates
* Before unallocated R&D and overhead costs.

Richard Aboulafia Biography
Richard Aboulafia is Vice President of Analysis at Teal Group Corporation. He manages consulting projects in the commercial and military aircraft field and has advised most prime and many second- and third-tier contractors. He writes and edits Teal Group's World Military and Civil Aircraft Briefing, a forecasting tool covering over 135 aircraft programs and markets, and has written numerous articles in Aviation Week, Aerospace America, and other publications. Frequently cited as an aviation industry authority, he has appeared on numerous television news programs, has spoken at a wide variety of conferences, lectured at the National Defense University and has served as an expert witness in aerospace markets. Before he joined Teal Group in 1990, Richard analyzed the jet engine market at Jane's Information Group, served as an aerospace industry consultant for an international trade advisory company and supported research projects at the Brookings Institution. He has a Masters degree in War Studies from King's College, University of London and a Bachelors degree from George Washington University.

In his capacity within Teal Group, Richard has provided market assessments to both Boeing and Airbus parent, EADS. Neither company represents more than 5% of Teal Group's annual revenue.

Philip Lawrence Biography
Philip Lawrence is the Director of the Aerospace Research Centre at UWE, Bristol. He is also the Founder and President of Lawrence Aerospace Ltd. He holds a Ph.D in Economics, as well as Master's degrees in both Political Science and Aerospace Engineering. He is widely known for his work as an aerospace/defence consultant and he has worked as an adviser to a number of European governments and prime companies. Professor Lawrence has written eight books on security, defence and aerospace issues; these include, Modernity and War, (1999), Aerospace Strategic Trade, (2001) and Deep Stall, (2005). Philip Lawrence is a fellow of the Royal Aerospace Society, the Royal Society of Arts and the NATO Atlantic Council.

Philip has worked with Airbus in the past as a consultant on aircraft engineering and WTO-related issues (World Trade Organisation), he has no current relationship with either Airbus or Boeing.

Growth, Capacity and Technology: Why the Airbus A380 will be a Major Commercial Success

Professor Philip Lawrence, Director Aerospace Research Centre, Bristol

Executive Summary

The Airbus A380 very large aircraft has been developed to fill a demand created by two key dynamics in world economic development. These are urbanisation and rapid economic growth in Asia. By 2020 there will be 16 cities in the world with populations greater than 20 million, 10 of these will be in the Asia-Pacific region. In China 20 million new middle class consumers are emerging every year based in the new urban centres along the east coast.

These dynamics create a powerful synergy, which is increasing demand for air travel. The synergy is evident in the economic impact of a new, urban-based and middle class consumer group in Asian states that wants to spend some of its growing disposable income on both domestic and international air travel. This is manifested in the fact that the world's fastest growing international aviation routes are pan-Asian, Asia-US and Asia-Europe. These new air travellers want to visit major centres of population, such as Paris, London, New York, Frankfurt, Rome, Los Angeles, Amsterdam, San Francisco and other major cities close to airport hubs. They are also highly price sensitive regarding their ticket purchase. The impact of these consumers on the world aviation system is to increase concentration and route density.

A380 makes sense as the air vehicle of choice to handle this new traffic because of its size, range and operating economics. By 2015 just three Chinese cities, where there are major air hubs will have a combined population of 40 million. Looking at US to China travel, these three cities are the destination of choice for 90% of all travellers. Other routes between major hubs are also growing in density. London-Dubai has been the fastest growing route in the world in the last 10 years, but London-Chicago also shows rapid growth. These major global routes are already very congested, but A380 offers the possibility to increase density on these routes without a large and highly problematic increase in flight movements.

Because of these structural dynamics, coupled with congestion in the world aviation system and the superior operating economics of the A380, this report concludes that the market forecast of Airbus for this segment is broadly correct, but probably slightly optimistic on total numbers. The author sees demand in this segment at around 1,450 units. However, Airbus's assumption that it will only take 50% of the segment is highly conservative as the 747-8 is a weak competitor. In the view of the author by 2015 Airbus will have delivered around 380 A380s, with approximately another 500 being produced in the period up to 2025. At current prices and assuming some discounting this amounts to revenue of around US$245bn.

Boeing, despite its point-to-point philosophy, has entered this market segment with the B747-8. But the venerable B747 is now 40 years old. However it is dressed up, the 747-8 is the fifth derivative of a 40-year-old aircraft that will not even have fly-by-wire flight management controls. Modern standards of maintainability and supportability presuppose the modularity of aircraft designs like the 787 and A380, but cannot be applied to the 747-8. In the history of modern aviation, new technology that offers superior cost performance invariably wins the day. This is borne out by both Airbus's A320 family and Boeing's 787. Because of this fact, the A380 is likely to represent about 65-70% of the sales in this segment. Total sales of the 747-8 up to 2025 are expected to be in the range of 450-500 units.

Current production delays and issues such as wake vortex are tangential to the long-term success of A380. The key issues for Airbus and its customers are the maturity of the A380 technology at entry-into-service and dispatch reliability performance. With 234 orders and options already achieved the prospects for the A380 look extremely good. The factors governing the future success of the program are now entirely in Airbus's hands.

Introduction

By the late 1990s, the international aviation system had seen nearly three decades of sustained growth in high capacity, long-range traffic, facilitated by a new generation of wide-body jets and high by-pass ratio turbo-fan engines, developed initially at the end of the 1960s. At the forefront of these was the now venerable Boeing B747, which in the

1970s bought a quantum leap in airliner productivity, with a 300% increase in capacity over its predecessor B707.

Thirty years later in the 1990s a number of airline chiefs and executives at Airbus Industrie were again rehearsing the arguments that gave birth to the B747. Growth in air traffic had slowed to about 5%, but this still meant a doubling of traffic every 16 or 17 years. With air traffic capacity constraints, increasing fuel prices, a strident environmental lobby and severe limits on building new airports or even runways, an obvious problem loomed: how could the prospective growth be accommodated with the existing size, range and performance of aircraft in the world's civil jet fleet? The various answers to this conundrum became the inspiration for Airbus's 550 seat A380, initially known as the A3XX and developed through its concept phase by the Large Aircraft Division of Airbus in Toulouse, next door to Blagnac airport.

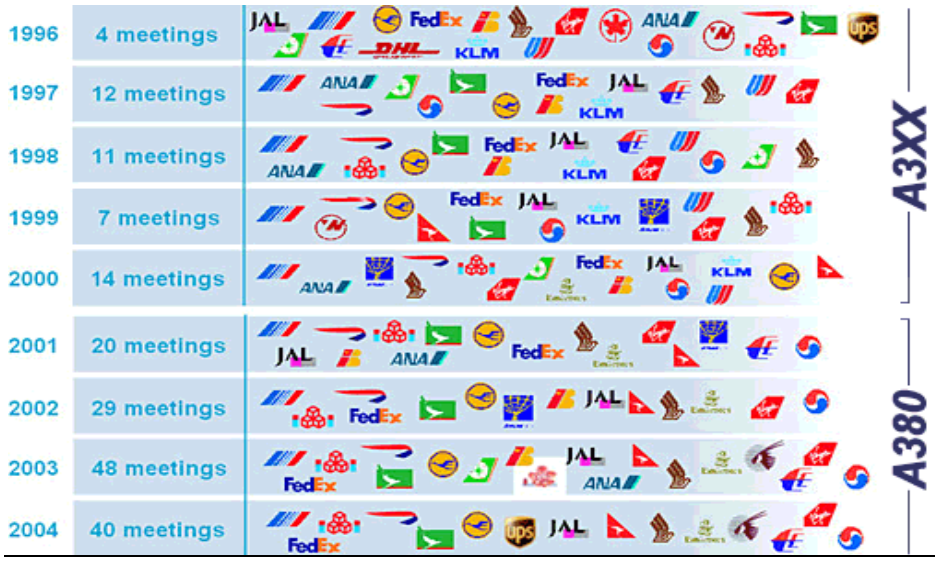
A380 Pedigree, Provenance and Market Analysis

Some reports in the print media have suggested that a recent slow down in sales of A380 is the result of poor or neglected market analysis.[1] However, this is entirely incorrect. From 1996 the A3XX team at Airbus's Large Aircraft Division conducted a series of meetings, workshops and seminars with potential A380 customers, all of whom had expressed a strong interest in seeing a modern, high technology replacement for the ageing B747. These commercial and freight carriers, such as Qantas, Lufthansa, Fedex, JAL and Emirates, also knew that a larger aircraft than the B747 would be needed to accommodate the passenger growth on long, thick routes between the world's major urban centres. Contrary to some of the propaganda, the market analysis and customer consultation process undertaken for A380 has been the most extensive and thorough ever undertaken in commercial aviation. As exhibit 14 indicates between 1996 and 2005 over 200 meetings and seminars were held, normally with at least 16 of the world's leading carriers present.

A380 sales now stand at 159 units and 75 options, ordered by 16 carriers. It is true that there has been a slowdown in orders since the early burst in 2001/2002, but this is for reasons that are entirely explicable and unrelated to market requirements. First, most potential A380 customers are B747-400 operators who have extensive fleets of the Boeing aircraft to retire. These 747s are an expensive asset, worth between US$30mn and US$100mn a copy and the correct financial arrangements for disposal are complex and time consuming to arrange. Older models with the RB211 powerplant are also difficult to sell on in the current market. Potential A380 sales to some blue-chip carriers are dependant on this process being resolved. Secondly, as Max Kingsley-Jones of *Flight International* recently pointed out, there is typically a lull in sales on an aircraft program in the run up to entry-into-service, as potential customers wait to see how the aircraft performs.[2]

Exhibit 14

The A380 Market Consultation Process



Source: Airbus

Exhibit 15
The Current A380 Order Book

Source. Airbus

There is also a possibility that some of the production delays and bad public relations that Airbus has endured in 2006 may have affected customer confidence. But this remains conjecture and certainly airline executives are well used to the trials and tribulations of bringing a new type into service. What stands out as a clear endorsement of A380 is that at Farnborough 2006 Singapore Airlines (SIA) increased the orders and options it has on A380 by another 15 units. The airline commented: 'Airbus has demonstrated to SIA's satisfaction that the design of the A380 is sound'.[3] Singapore Airlines has one of the strongest brand and image reputations in international aviation and is also well known for stringent and efficient financial management. The endorsement of A380 by such an efficient and pragmatic airline augurs well for the program's future.

Hub and Spoke versus Point-to-Point: the Case for A380

As the post-1978 deregulated aviation system emerged a hub and spoke system of aviation transport developed, linking both large hub airports directly and smaller airports routed through the major hubs. This hub focused system is highly efficient because the most effective way of linking remote points on a network is via a central point from which multiple destinations are possible. On a direct point-to-point basis 5 aircraft can link 10 cities. In a hub and spoke system the same number of aircraft can connect 55 destinations[4]. The system is also economically efficient because of economies of scale for the airports and major carriers.

The earlier point-to-point system of the pre-deregulation era resurfaced in the 1980s as liberalisation increased the numbers of direct city pairs and the scope of airlines to fly where they wanted. Two kinds of point-to-point emerged; direct long-haul business links between large and medium sized cities (normally on trans-Atlantic routes) and short-route low-cost operations linking new city pairs. The driver for the first, in the case of the business traveller, was convenience and for the latter cost. However, the re-emergence of point-to-point in the 1980s and 1990s was a refinement to the prevailing hub and spoke system; it did not augur its replacement. The dominant hub and spoke system reflects powerful demographic, economic and political factors, which will shape the aviation system for the next 50 years. The A380 is the right response to those structural factors.

Economic Growth, Demographics and the Aviation System

It is a basic axiom of aviation economics that increasing demand for air travel is closely linked to rising world GDP. As exhibit 16 reveals this is why air traffic is growing so fast

in Asia and on Asia-Pacific, Asia-US and Asia-China routes. Especially in less developed countries, where most individuals have never travelled by air, there appears to be a threshold in real incomes which triggers first, domestic air travel and then, secondly, international travel. In Asia, particularly in China and India, an explosion in economic activity has seen huge growth rates in the last 20 years. Over the last decade growth rates close to 8% have been sustained in both states. As a result millions of new middle class consumers are appearing in Asia who are ready and eager to travel by air. According to Mark Ade, 22 million new Chinese middle-class consumers will emerge annually over the next 20 years creating a dynamic, demand-driven travel market.[5]

Hand in hand with rising GDP in the less developed world comes urbanisation, with millions of individuals flocking to the new mega-connurbations in search of economic opportunity. Thus there is a virtually perfect economic and demographic synergy driving demand for very large aircraft like A380. Millions of new consumers in Asia looking to travel to Europe and the US by air, are increasingly located in the world's largest mega-cities. These consumers want to travel to the major urban centres in the West, not obscure secondary destinations served by point-to point operations.

Globally, urbanisation is one of the most pronounced trends of recent times. In Asia the number of individuals living in cities will have nearly doubled in the time-scale 2000-2025[6]. In China, by 2015 some 40 million people will be resident in Beijing, Guangzhou and Shanghai alone.[7]

With Asia-Pacific, Asia-US and Europe-Asia the fastest growing international aviation routes it is scarcley credible to believe that the resulting traffic can be handled by medium-sized aircraft like the B787.

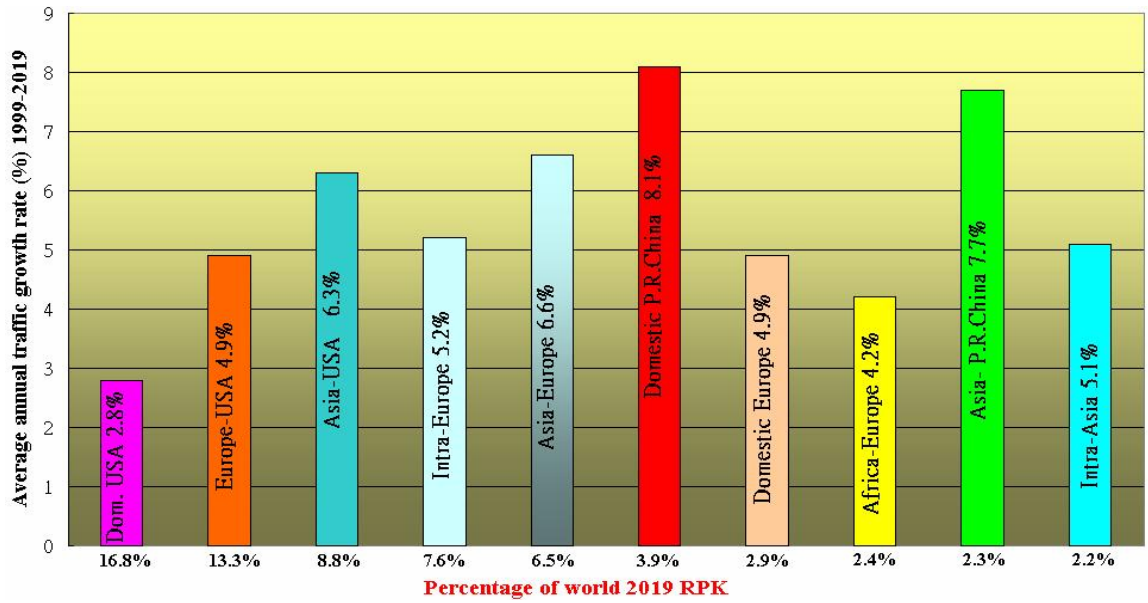
Hub to Hub Concentration

To illustrate the point about hub to hub traffic it is insightful to take the case of China-US routes. Looking at US to China travel, 90% of passengers arrive at just three destinations. Exhibit 16 shows the concentration.

Looking at travel exit points, from the more pluralistic and diverse US, even here 70% of visitors to China depart from just three cities, Los Angeles, New York and San Francisco[8]. With regard to urbanisation it should be noted that the trend is more ambigous in the West, but that mega-cities such as Los Angeles and New York continue to show significant growth. By 2015 the combined population of those two cities alone will be around 33 million.

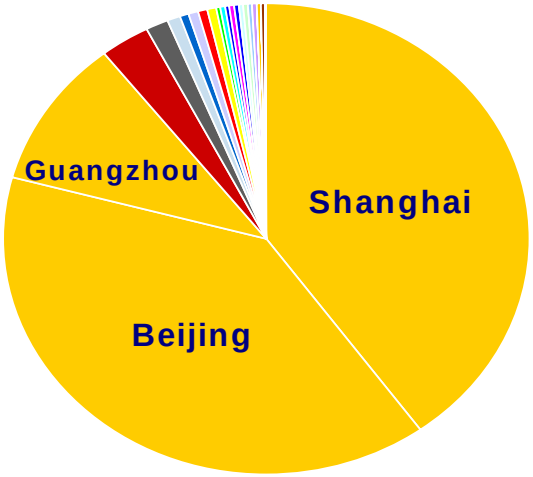
Exhibit 16

Annual Average Traffic Growth to 1999-2019



Source: AlliedSignal analysis of IATA Traffic Projections

Exhibit 17
Mainland China Destinations from the US (90% to 3 cities)



These three cites will have a population of 40 million by 2015. They are the clear destination for travellers from the US to China with 90% of visitors targeting these points of entry.

Source: Airbus SAS Global Market Forecast, 2004

Another key driver behind the need for an aircraft like A380 is the growing congestion in the world aviation system, this is especially apparent in air traffic control of approaches to major airports and also in gate capacity on the ground. This point alone leads the analysis here to assume that the bulk of expansion in the next 20 years cannot be handled by adding over 6200 medium-sized twin aisle jets to the fleet, as Boeing appear to believe.[9] Environmental issues, capacity constraints and security issues will put limits on the total number of flight movements that can be permitted. In the pre 9/11era it was believed that the new concept of free flight would loosen the control of aircraft routings and allow pilots more autonomy in navigation choices. But post-9/11 it is scarcely credible to believe that states will allow a lessening of control over flight routings.

With respect to capacity, in the allegedly fragmented US market, 70% of all flights utilise 30 major airports. In the last 10 years these major airports have added 6 new runways, but to cope with the projected traffic growth some 25 new runways are needed.[10] A building program is underway, but the availability of new runways will never catch up with the increasing demand.[11].

Similar constraints exist in Europe. Germany's mega-hub, Frankfurt, is already stretched to the limit and with traffic growing at 3.45 percent per annum a chronic shortage of slots is imminent. Unlike many other airports, Frankfurt is able to expand, with a new runway and planned new terminal, but such expansion is highly controversial amongst the environmental lobby.

Certain key trunk routes in the aviation system are highly congested; for example, London- Hong Kong is now seeing 6 departures every 1.5 hours, and Tokyo-Los Angeles requires 7 departures every 3.5 hours. As demand increases on these routes this congestion can only be alleviated by increasing aircraft capacity. With the A380 having 35% more passenger capacity than the 747-400 the solution is obvious. Also, any change in the aviation system that can increase utilisation and efficiency, without raising environmental issues is highly desirable. This is one of the key assets of A380, with three of the Airbus planes carrying the same passenger loads as four 747-400s or six B787s.

Specific A380 Issues

Production Delays

With very large engineering projects the handover from the development phase to production can be messy, with configuration issues complicating the template for production. With A380 four issues have conspired to cause the current production glitches.[12] First, the planned resource contingency to fix the configuration issues arising from static and flight testing have not been sufficient. There have been more modifications than Airbus anticipated and they have taken longer to resolve than managers foresaw. Secondly, the whole process of designing, producing and installing the aircraft's wiring has been made significantly more challenging by the amount of new technology in use and the fact that the aircraft has a double-decker cabin throughout its length. Thirdly, modern design relies heavily on digital tools and online digital mockups for development. However, the exact performance and capability of an aircraft and its

systems still shows some key changes at the point of integration and flight test. This real world experience provides data that can lead to modifications and configuration changes. Finally, the size of the A380 cabin has provided airline designers with unprecedented scope for customisation, allowing the specific carrier to tailor its flagship to a unique brand and image concept. For obvious reasons Airbus has been very permissive in allowing both extensive and late cabin modifications, which has undoubtedly impacted the wiring issue. Extensive customisation complicates configuration and slows down the freeze of a stable production template.

All of these problems are in scale with the typical experience of aircraft manufacturers. In 1997/1998 Boeing exhibited similar problems on a number of programs, but their impact was much more severe than the difficulties at Airbus. Boeing soon recovered and the markets very quickly forgot Boeing's fall from grace.[13] What the Airbus problems show is that the learning curve is extremely steep at the initial point of production. But the good news is that the gains in efficiency as production ramps up will be enormous with huge learning by doing economies. EADS will experience an annual drop in EBIT of €500mn from 2007 to 2010 because of the impact of these delays on delivery, but Airbus will easily step up to planned production levels of four aircraft per month by 2009.

Wake Vortex

Wake vortex is a complex issue which is widely misunderstood. The debate around A380 has focused very much on the sheer mass of the aircraft, but mass is just one of a number of factors that influence the scale and intensity of wake vortex. The severity of the wake-vortex hazard is mainly dependent on the size, geometry, and operating conditions of the generating and trailing aircraft; the distance between the two aircraft; the angle and altitude of the encounter; and local atmospheric conditions that influence the position, strength, merging, and decay of the vortices[14]. Critically, the overall aerodynamic geometry of the aircraft is just as important as size. To amplify this point an aircraft which has a rather controversial history regarding wake is the B757, which in some tests has been shown to have a much greater wake vortex than the larger B767. Having caused a number of accidents the 757 was reclassified by the FAA as a "heavy aircraft" in the 1990s after a series of interventions by the NTSB.

Under visual flight rules (VFR) operations, the responsibility for aircraft separation distances may be given to the pilot during the approach phase. In this situation, the primary constraint on following distance is usually the time interval for the leading aircraft to clear the runway prior to the landing of the following aircraft. However, under instrument flight rules (IFR) conditions, air traffic control has direct responsibility for separation according to FAA-mandated standards that are a function of the classifications of the leading and trailing aircraft.

Definitive test data for A380 is not yet publicly available and it should be noted that experts have never agreed a commonly accepted testing standard on this question, which complicates regulation. However, the Airbus test program on wake has been more exhaustive than any previously undertaken and should assist the airworthiness authorities in making a sound regulatory decision. But, as initial separation distances given at entry-into-service tend to be conservative, a small increase in separation distance over the heavy category may be mandated for A380. This will have only a minor impact on operations, as the greatest threat posed by wake turbulence is to small, general aviation aircraft and anyway it will be more than offset by A380s greater capacity. Following some in-service experience it may be that A380 will be downgraded into the heavy category.

Exhibit 18

Current FAA standards for aircraft separation during IFR conditions

Generating Aircraft	Seperation Distance for Trailing Aircraft in NMI		
	Small	Large	Heavy
Small	2.5	2.5	2.5
Large	4	2.5	2.5
757	5	4	4
Heavy	6	5	4

Source: Federal Aviation Administration (FAA)

The Market and the 747-8 Competitor

Broadly speaking Airbus and Boeing agree on the size of the future aviation market, valuing it at around US$2.6 trillion over the next 20 years, but they disagree strongly on the types of aircraft that will be needed to meet the demand. Boeing foresees growing fragmentation and the need for a huge increase in the fleet of mid-sized twin-aisle aircraft to service a point-to-point system. Airbus anticipates a smaller requirement for mid-sized aircraft and believes that more of the passenger growth will be absorbed through the use of very large aircraft, like the A380.

Although aircraft fleet market forecasts appear to be the very essence of quantified, empirical science, the truth is that the models upon which they are based are replete with assumptions, extrapolations from past experience, guesses and subjective judgements. To amplify this point, Boeing's forecast of the very large aircraft market has changed radically from year to year over the past decade and appears to follow, rather than lead its product development portfolio. As *Flight International* noted in February 2006:

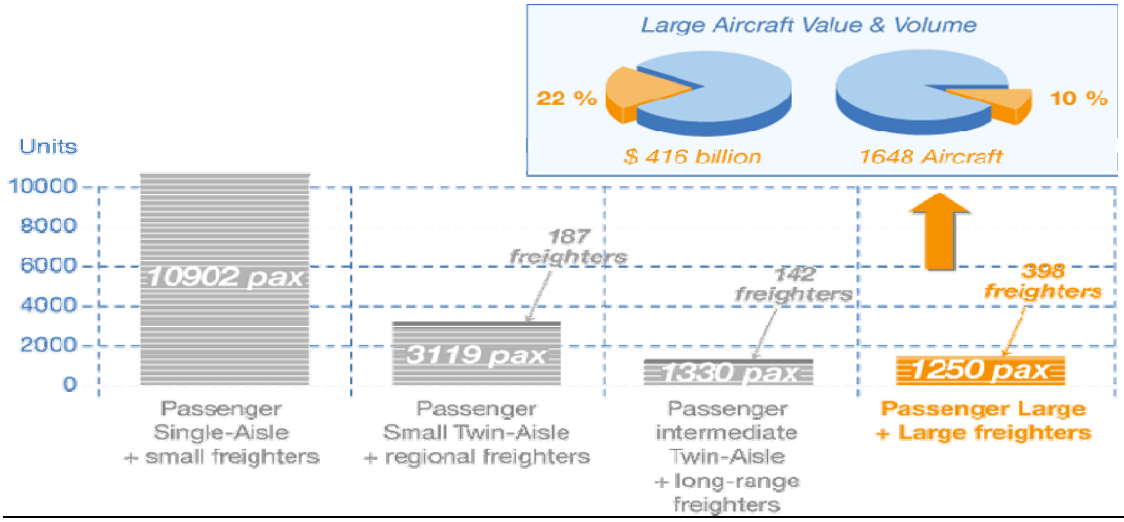
> However, Boeing's long-term forecast for overall demand in the "747 and larger" sector (400-seat-plus passenger aircraft and large freighters) has varied dramatically over the last decade from a high of 1,600 in 1996, when it was poised to launch a 550-seat 747 stretch family, to a low of 790 in 2004. Significantly, last year Boeing bucked the recent trend by increasing its forecast (by 15%) to 907 units as it prepared the ground for the 747-8 launch, having consistently reduced its outlook each year in the period 2001-4.[14]

Looking at the structural trends in the global economy and world demography identified in this report it seems to the author that Boeing's evolving market model understates the impact of urbanisation, congestion and Asian economic growth on the pattern of future air transport. In addition, the security agenda of the next two decades will actually demand greater, not lesser control of the world's aviation system, which is not compatible with increased fragmentation. The future scenario of the world's aviation system developed here therefore tends to support the market model developed by Airbus, which has presented a stable forecast for very large aircraft over a ten year period. Particularly because of the rapid growth of mega-cites the current hub-based system of aviation will remain substantially unchanged and will feed substantial demand for very large aircraft such as A380.

In its passenger version the 747-8, which no airline has yet ordered, cannot be seen as a credible competitor to the A380. This is the fifth derivative of a 40 year old aircraft that does not even have fly-by-wire flight controls. The aircraft lacks any development potential and has a number of key weaknesses in comparison to the A380, which uses new materials, and has new technologies such as electro-hydrostatic actuation and integrated modular avionics, not to mention an all-new and far superior wing with greater lift and aerodynamic efficiency.

Exhibit 19

Airbus's view of the Future Large Commercial Aircraft Market



Source: Airbus SAS, Global Market Forecast, (2004)

The 747-8 was launched with no orders for the passenger version and has no engine choice and no commonality with the B777 and B787. Also the same 40 year old cabin, unlike the 380, offers little in customisation options to airlines. Boeing emphasizes commonality with the existing 747 family, but these are precisely the types of aircraft that will be phased out over the next decade or so.

Looking at the rival claims of the manufacturers regarding the cost performance of the two aircraft it is impossible to reach a conclusion without access to confidential test data. But having compared and evaluated the data *Flight International* commented that, 'Wherever the truth lies within these operating cost claims, few would dispute Airbus's view that the all-new A380 design with its double widebody-deck configuration will provide airlines with "game-changing" opportunities'.[15]

Conclusion

This report argues that key structural dynamics in world economic and demographic development underpin a strong business case for Airbus A380. Rapid urbanisation in Asia, coupled with the rise of a new middle class, is fueling strong demand for air travel amongst groups who reside in the world's growing mega-cities. Routes such as London-Hong-Kong. London-Singapore, London-Mumbai, Paris-New York, Tokyo-Los Angeles. Beijing-San Francisco, Frankfurt-Shanghai and Paris-Beijing are both growing and congested. A380 is the answer to this congestion. In terms of market share the A380 does not face a significant threat from the 747-8 because it is old technology. Doubtless customer loyalty, commonality with existing fleets and geo-strategic factors will secure some sales for the Boeing aircraft. But it will take no more than 35% of the market. Overall this report envisages the very large aircraft segment of the market to be around 1400 units up to 2025, worth some US$385bn. Because the 747-8 is old technology and had no development potential it is estimated that Airbus will capture around 65-70% of this segment, worth approximately US$250bn.

Exhibit 20

A380 and B747-8 Specifications

A380 AND 747-8: HOW THEY COMPARE				
	A380-800	747-8I	A380-800F	747-8F
Length (m)	72.7	74.3	72.7	76.3
Wingspan (m)	79.8	68.5	79.8	68.5
Height (m)	24.1	19.4	24.1	19.4
Maximum take-off weight (t)	560	436	590	436
Range (km)	15,000	14,800	10,400	8,280
Cruise speed (Mach)	0.85	0.85	0.85	0.85
Maximum fuel capacity (l)	310,000	227,900	310,000	215,400
Seating (3-class)/Payload (t)*	555	450	152	133.9
Max interior width (m)	6.5/5.9**	6.1	-	-
Total installed thrust (lb)	280,000	266,000	306,000	266,000
List price ($ million)	272-292	250-265	272-292	265-275
First delivery	Q4 2006	Q1 2010	Q3 2008	Q3 2009

Notes: *Freighter versions. **Main/upper deck
Source: manufacturers

Source. Airbus and Boeing

Exhibit 21
Airbus and Boeing's View of Relative Cost Performance

A380 VS 747-8: THE MANUFACTURERS' CLAIMS		
	The Airbus view A380 vs 747-8	The Boeing view 747-8 vs A380
Passenger aircraft		
Cost per seat	-9%	-6%
Cost per trip	+12%	-22%
Fuel burn per seat	-2%	-13%
Fuel burn per trip	N/A	-22%
Freighter aircraft		
Cost per tonne	Comparable/-15%*	-15%
Cost per trip	N/A	-20%
Note: *short-range/long-range with maximum structural payload		

Source: Flight International 17-24 February, 2006

1 See Richard Aboulafia, *Wall Street Journal* (June 20, 2006)
2 See *Flight International*, (1-7 August, 2006. p. 34.)
3 Ibid, p. 34
4 Renato Picardi, 'The Virtual Hub', *Round Table 126*, European Transport Ministers Conference, (Politecnico Milano, 2003)
5 Mark Ade, /www.eds.com/news/features/3034/
6 Population Division of the Department of Economic and Social Affairs of the United Nations Secretariat, *World Population Prospects: The 2004 Revision* and *World Urbanization Prospect.*
7 Ibid.
8 See Airbus SAS, *Global Market Forecast*, (2004, p. 23)
9 See Boeing, *Market Overview*, 2006
10 Renato Picardi, 'The Virtual Hub', *Round Table 126*, European Transport Ministers Conference, (Politecnico Milano, 2003)
11 Ibid.
12 For a full account see *Flight International*, (18-24 July 2006, pp. 26-18)
13 See Philip K. Lawrence and David W. Thornton, *Deep Stall*, (Ashgate, 2005, ch. 8).
14 See, Gail S Langevin - *Concept to Reality – Wave Vortex Hazard*, (NASA, Langley, 2003).
15 *Flight International* (17-24 February, 2006)

The A380: A Bad Idea That's Come Home To Roost

Richard Aboulafia, Vice President, Analysis, Teal Group Corp.

As a misinvestment, the A380 manages to cover all bases. It's a tremendously expensive way to address a market that's small and shrinking. It also looks like a mediocre performer, even when addressing that limited market.

To address the origins of this misinvestment, we need to examine the evolution of the jet transport market over the past 15 years, and the broader context of the A380 launch decision

Flying Against Market Reality

The A380's origins date back to 1990, when the equipment used for intercontinental flights was considerably inferior than today's. If an international carrier wanted long range and good economics, it didn't have many choices. The 747 was the gold standard, and Airbus understandably envied Boeing's strong profits from this program. While the A310, DC-10, 767, and L-1011 offered respectable smaller alternatives, none had the range, and airlines couldn't buy an intercontinental jet with 260-400 seats. Extended-Range Twin Engine Operations (ETOPS) regulations prevented twinjets from realizing their full route development potential.

The arrival of the MD-11, A330, A340, and 777 in the 1990s allowed airlines to obtain mid-sized aircraft with intercontinental range and superb seat mile costs. Meanwhile, ETOPS restrictions have been steadily relaxed, greatly improving the appeal of twins like the 777 and A330. Even better is coming—the 787 and A350 XWB will provide superior economics for mid-sized routes.

The smaller jets have also allowed airlines to optimize their passenger loads. When carriers such as British Airways or Japan Airlines replaced 747s with 300-seat planes, they used improved pricing software to get rid of the 120 lowest fare passengers. The smaller planes allowed airlines to shift their focus away from market share and towards profitability.

The new equipment also encouraged route fragmentation. This fragmentation has taken two primary forms:

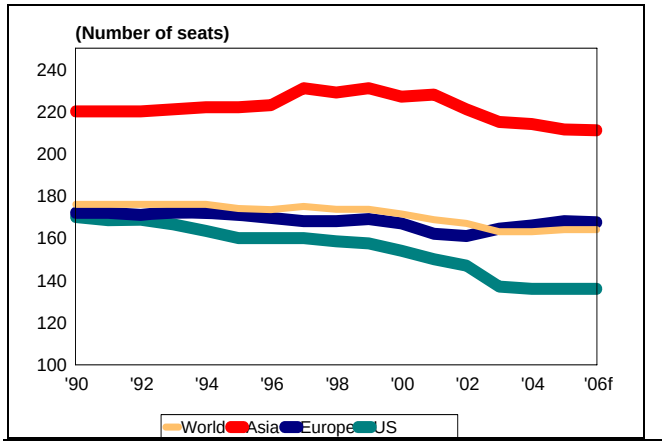
1. **Schedule.** Greater frequency (and therefore flexibility) is something travelers will pay for. Why have four 420-seat flights per week when you can offer seven 250-seat flights?
2. **Geographic.** Now that smaller planes are as efficient as larger ones, why not fly people directly to their destination? Travelers will pay more to not change in Frankfurt or Narita. This geographic fragmentation is aided and abetted by new **bilateral air service agreements,** like the recent one between the US and India (explaining why Air India is refocusing its fleet around 250/350-seat planes).

New airlines and airline brands are gradually providing a third form of fragmentation. As economies liberalize, the last near-monopoly flag carriers face growing competition from new players and established international carriers. In short, there are new players, or **brand fragmentation.** The market has also seen new low-cost subsidiaries of legacy airlines engendering further brand options (Qantas's Jetstar brand is the best example of this which explains why both entities recently went for 787s alone rather than buying bigger planes).

North Atlantic routes provide the best illustration of fragmentation. According to the US Department of Transportation, in 1990 747s were used for 43% of US transatlantic departures (smaller twin aisle planes and a handful of narrowbodies constituted the other 53%). By 1995, the 747's share had declined to 28%. By 2000, the 747's share was down to 23%. That figure is still dropping.

Exhibit 22

Average Number of Seats Per Aircraft



Source: Airline Monitor

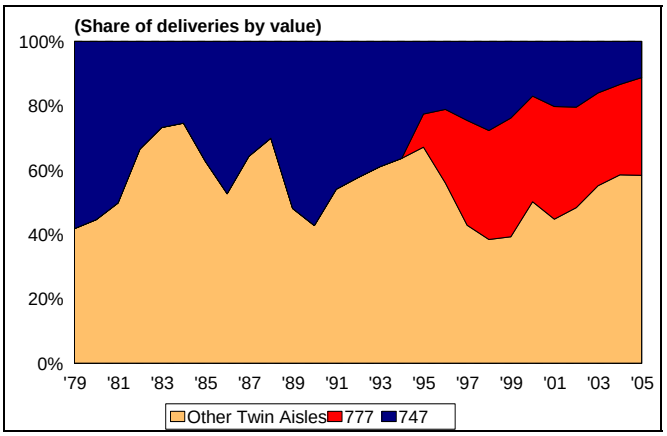
The result of all of this new technology and route fragmentation has been a gradual reduction in the average size of aircraft. Of particular interest is the recent size reduction in Asia, as new long-range equipment comes on line.

By the time Airbus launched the A380 in 2001, the handwriting was clearly on the wall. Although Airbus maintained that the 747 was still Boeing's cash cow, its place had been taken by the 777. Every major international airline in the world, except Qantas and Lufthansa, operates it. By 2005, 747 deliveries constituted a mere 11% of the twin aisle market by value, down from 60% in 1990. The 777 held 30%, with a record backlog. Airbus's strongest position was one notch below in size, the 250/300-seat A330, which held 32% of the 2005 twin aisle market.

Just as importantly, when the A380 was launched both manufacturers were on their way to developing the A340-600 and 777-300ER. These planes are only 40 seats smaller than a 747, but have similar range and better economics. The 777-300ER has been a particular success, with 211 orders through July. Despite the imminent arrival of these near-competitor planes, Airbus continued to insist that the 747 would always be Boeing's cash cow, and that they needed to introduce the A380 to stop its long reign. Airbus made a huge product launch decision as if the previous ten years hadn't happened.

Exhibit 23

Twin Aisle Deliveries, 1979-2005

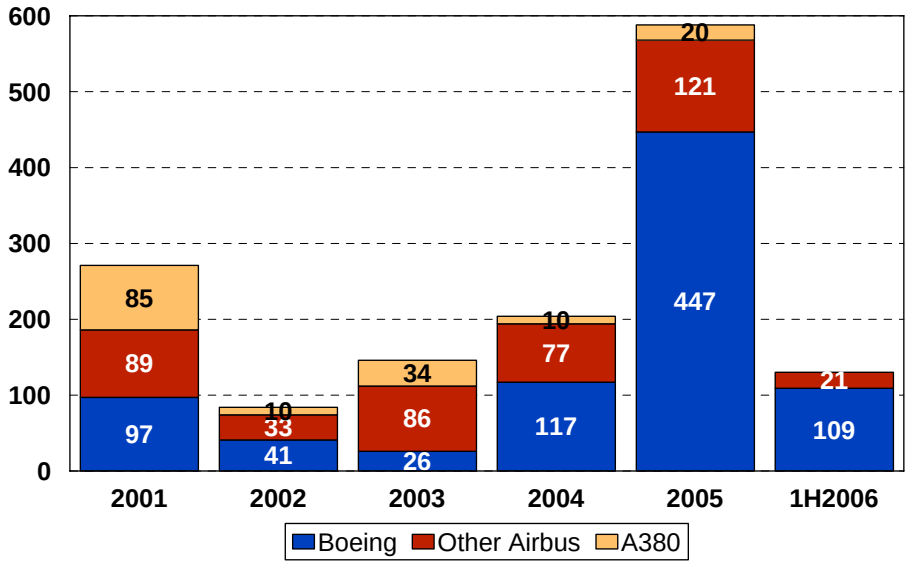


Source: Teal Group analysis of Airbus and Boeing data

All of these market developments are in the past. From an A380 program standpoint, the future of the market is far more worrying. The A380 received 85 up-front orders in its first year on the market. But this was quickly followed by five years of sluggish demand, if not outright irrelevance.

Exhibit 24

Twin Aisle Orders Since A380 Launch



159 A380s, 101 747s 1,163 mid market (incl.100 A350s)

Source: Teal Group analysis of Airbus and Boeing data

The large aircraft segment today is a sideshow. The real action is in the 200/380-seat market, where Airbus and Boeing sold 1,163 widebodies while Airbus sold a mere 159 A380s. Of the current 159 A380 orders, 45 are for Emirates. While Emirates has grown at remarkable rates over the past five years, there are legitimate concerns that this growth will slacken. Worse, the carrier has ordered extraordinary numbers of other twin-aisle planes—it is the biggest 777 customer in the world—and plans to order even more 300-seat jetliners. Emirates has the market clout to defer types of planes as needed, as its route network evolves. If its network fragments along traditional carrier lines, A380 deliveries will slow accordingly.

There's also the question of future A380 sales prospects. Airbus has claimed that customers were waiting until the A380 entered service before ordering. The tremendous up-front demand for both the 787 and A350 (and the 747's historical experience) clearly shows that if airlines want a plane, they order it early on. The 787 has garnered about 400 orders even though it is two years from service entry. The A350 order book hit 100 planes in the last aircraft incarnation. Airbus expects most of these to be retained for the XWB model, with new customers such as Singapore Airlines already showing interest, even though it won't enter service until 2012, at the earliest.

It's also difficult to identify customers that have announced requirements for aircraft in the A380 size class. Several high profile customers, most notably the two main Japanese carriers, have already signaled that they have no interest in the A380, which is unusual for any new aircraft program.

On the positive side, at the Farnborough Air Show, Singapore Airlines signed a letter of intent to convert nine A380 options to firm orders. This has not yet happened. Also, Airbus officials have confidently predicted that 2006 will see about 20 orders for the A380.

What's unusual is that this news is being greeted by A380 supporters with glee. Neither Singapore's nine option conversions, nor the total of 20 A380 sales this year, **if** they happen, would change the obvious trend outlined in the orders chart. They would represent a modest show of confidence in a floundering program. They most certainly would not represent a revitalized market niche, nor would they indicate any kind of shift in customer preferences.

A True Heavyweight

Airbus touts the A380 as a major technical achievement. Yet it is very difficult to identify what new technologies or features are embodied in the design. Aside from its sheer size and double deck layout, the A380 uses a traditional design approach and is largely constructed of conventional metals. Many components are derivatives or directly off-the-shelf.

But even with that traditional approach, something seems to have gone wrong. Using stated manufacturer operating empty weight (OEW) figures (the weight of an aircraft ready to fly without passengers, cargo or fuel), and dividing these figures by stated manufacturer seat counts (for three-class configuration), produces a curious result. On a per-passenger basis, the A380 is considerably heavier than any of its peers.

Exhibit 25

A380: Highest Operating Empty Weight Per Seat

Aircraft	Range (nmi)	Pax (3-class)	OEW	lbs/seat
A330-200	6500	253	265655	**1050**
787-9	8800	259	240000	**927**
777-300ER	6240	370	370000	**1000**
A340-600	7500	380	391760	**1031**
747-400ER	7260	416	406900	**978**
A380-800	**8000**	**555**	**610680**	**1100**

Source: Teal Group analysis of Airbus and Boeing company data

Empty weight is the best guide, but we do not yet have these for the 747-8 or A350 XWB. But using maximum take-off weight (maximum weight with which an aircraft can take flight) figures instead of empty weight produces similar results: the A380 is heaviest per seat by a considerable margin:

Exhibit 26

A380: Highest Maximum Take-Off Weight Per Seat

Aircraft	Range (nmi)	Pax (3-class)	MTOW	lbs/seat
A330-200	6500	253	507060	**2004**
787-9	8800	259	540000	**2085**
A350XWB-900	8500	314	584200	**1861**
777-300ER	6240	370	760700	**2056**
A340-600	7500	380	804675	**2118**
747-400ER	7260	416	875000	**2103**
747-8	8000	450	960000	**2133**
A380-800	**8000**	**555**	**1234580**	**2224**

Source: Teal Group analysis of Airbus and Boeing company data

The A380's high specific weight is due to any of these three reasons:

1. **The -800 is the shrunk version first**. In its quest to create as large an aircraft family as possible, Airbus designed the wing, other structures, and systems appropriate for a range of planes between 550 and 800 seats. Since there was no market for a larger plane, they launched the shortest version first. In addition to creating a relatively uncompetitive model, this strategy also meant abandoning the 400/500-seat market to Boeing and the 747.

2. **Inadequate use of new materials.** The A380 was launched just prior to an industry revolution. Composite materials, particularly carbonfiber reinforced plastic (CFRP), promise to transform jetliner design and construction. Both manufacturers are committed to this significant and epochal shift. The 787 design is 50% carbonfiber (by structural weight). Airbus says the A350 XWB will be 45% carbonfiber composites and a total of 62% advanced materials. Both manufacturers say their next narrowbodies (replacing the A320 and 737 families around 2013) will be primarily constructed of composites. By contrast, A380 advanced materials use comprises just 22% carbonfiber and 3% glass reinforced aluminum (GLARE). The rest is traditional metal. It has more in common with the last generation of jetliner designs from the early 1990s than it does with the emerging new generation.

3. **The A380 design caters to the most strenuous users.** The launch customer, Singapore Airlines, was a tremendously contested competition, with Airbus prevailing over an upgraded 747. Singapore had the leverage to demand a plane that met its stringent performance needs. Since much of the A380 order book comprises other airlines with similarly strenuous (albeit marginal) requirements, it's likely that the A380's design features are only economical at the outer end of the range/payload envelope.

But Airbus's stated A380 weights, bad as they are, have not changed in recent years. That is cause for concern. There have been rumors of weight increases, and in February a test wing broke just below the design target, implying a need for structural reinforcement. In July, Airbus admitted that it was also reinforcing the rear fuselage after unspecified problems were found in the rear of the aircraft. Both of these structural changes add weight.

In short, there's the difficult and likely prospect that the A380's weight is even higher than stated, making it even less competitive than its peers. This weight problem puts a twist on the current production difficulties. In June, Airbus announced that A380 production in 2007 will be limited to nine aircraft. The 2008 plan was reduced by 5-9 aircraft to 26-30 aircraft, and the 2009 plan reduced by five to 40 aircraft.

Airbus blamed the production problems on electrical system integration problems, and late specification changes for cabin equipment. But it is very unusual to be making airframe design changes this close to service entrance. It is quite likely that these changes contributed to the program delays.

Even if the wing and fuselage strengthening changes by themselves aren't causing the production delays, it's quite possible that Airbus needs to make other A380 design changes to keep its weight down after reinforcing the other components. Airbus might be building overweight aircraft from components already in the system, while hoping to implement design changes to follow-on aircraft assembled after 2007.

The A380 weight question also raises the issue of 747-8 competitiveness. While based on an older airframe, the new 747 uses the latest engine and systems technology, and it retains a relative weight advantage over the A380. The A380's double deck design also means it has considerably less belly cargo revenue potential than a single desk of the same length. But so far, the 747-8 has only enjoyed success as a cargo plane. The sole passenger version order is for a VIP aircraft. Therefore, our forecast calls for the 747 to remain a predominantly cargo carrier, with about 22-24 deliveries annually (roughly equal to A380 deliveries in terms of dollar value).

But if the 747-8 receives a significant passenger version order from a blue chip carrier (such as Cathay Pacific, British Airways, or All Nippon), it could serve as a powerful endorsement for other airlines. The forecast up side for the 747 could be as high as 48 aircraft annually, some of which would come out of A380 demand (the rest would come from 777-300ER and other mini-jumbo demand).

Putting It All Together: The A380's A350 Problem

It isn't necessary to use a Boeing plane to demolish the case for buying the A380. Any airline seeking to serve long haul international routes merely needs to look at Airbus's A350 XWB. By choosing the latter aircraft an airline benefits from strong advantages:

1. More advanced engines. GE says the A380's GP7200 engines have a 4% fuel burn disadvantage compared with the new GEnx series, entering service on the 787. Airbus intends to leverage that new engine technology on the A350, with even greater efficiency improvements.

2. **Considerably less weight per passenger** (and **lower seat mile costs**, thanks to this lower weight and the A350's more modern engines and wings).

3. Lower maintenance costs (and production costs) through the use of more advanced materials and systems.

4. A more advanced all-composite wing, which will likely further reduce operating costs.

5. Greater range.

6. Greater revenue-producing belly cargo relative to aircraft size.

7. Better chance of primary airline customers finding secondary buyers (due to much more diverse user base). This means higher residual values (as percentage of original price).

8. Greater route flexibility—ability to develop more point-to-point routes, or to offer greater frequency on existing routes.

9. Reduced need to fill plane with discounted fare travelers, especially in times of slack demand. No airline ever went bankrupt flying a plane that was too small.

By any conventional estimate of airline economics, if **Airline A**, using A350s, competed with Airline B, using A380s, **Airline B** would be at a severe competitive disadvantage on most of its international route network.

To look at it another way, why would **Airline B** choose the A380, with its myriad disadvantages, over the more modern and flexible A350 XWB? The only possible reasons concern airport capacity. There are almost no airports that are truly operating at capacity, but some airlines are slot constrained, particularly at major international hubs like Heathrow. There are also city pairs that are launch constrained—that is, airlines can't leave or arrive at unpleasant hours, so there is limited potential for schedule fragmentation.

It's important to keep the capacity constraint issue in global perspective. There are currently over 18,000 jets in world airline service. In recent years, it has been swollen by well over 1,000 regional jets. The world airline fleet will double well before 2025. The skies are also clogged with well over 10,000 business jets, another galloping market. Replacing 250 550-seat planes with 500 275-seat jets will not materially affect this congestion issue, particularly since using larger jets necessitates using more feeder planes for connecting "spoke" flights (in lieu of direct point-to-point traffic). Clearly, constraints happen at specific airports, but this is not a global issue.

How big is this highly specific market? At best, these capacity constraints affect 5-8 airports, and about 50-60 city pairs. This is a small niche.

The A380's current order book and level of new order intake reflects this niche. Except for much of the Emirates order, A380 demand implies an up-front level of demand that caters to slot-constrained and launch window constrained carriers. What we've seen is what they'll get: 85 up-front orders, and an average of about 20 planes per year in incremental demand.

The A380 is the only new twin aisle launched with simultaneous passenger and cargo versions. But Airbus should not look to the cargo market for salvation. As a double deck design, its capacity for heavy cargo is quite limited, and it doesn't have the 747's front cargo door. It will garner a few orders as a package freighter—FedEx and UPS, the major package freight carriers, are part of the current order book. But Emirates recently confirmed the A380's inadequacy as a cargo plane. After switching its A380F orders to passenger versions, the carrier agreed to order 10 747-8Fs.

The Myth Of The Growth A380 And Total Program Economics

Airbus touts the prospect of a growth A380, with 650/700-seats. On the face of it, this is not a bad idea. It would need to be a stretch–cramming more into economy class would

only be good for a few dozen extra seats, and converting business and/or first class seats into greater numbers of economy seats would kill profitability. Still, a stretched A380-900 would certainly have better seat mile costs, thanks to the better passenger/weight ratio of any stretched model. More importantly, it might take advantage of a market that *could* reverse itself after decades of route fragmentation. Perhaps by 2020, the current wave of mid size plane adaptation for international routes will reverse itself, and routes will thicken again.

But technological change kills this redeeming scenario. Assuming Airbus and Boeing are correct about composites, stretching a 78% metal plane in ten years will have very little customer appeal. Conceivably, the A380 could be re-winged with a composite wing.

But the development price tag for this version would be at least half as much as an entirely new plane. The cost of re-engining and stretching the A380 would add to the development bill. And as Airbus found out with the initial A350 incarnations (those derived from the A330), composite insertion into existing models makes for an uncompetitive product.

If the market for large aircraft did improve, Boeing could launch an all-new 747-replacement, based on composites. This would do to the A380 what the 787 is doing to the A330, or what the A350 XWB will do to the 777-200ER.

This raises the difficult question of estimating total A380 numbers. Airlines don't rigidly buy planes in certain classes, according to some grand plan. Rather, they survey the competitive landscape. If smaller planes offer better seat mile costs, airlines will buy them, unless they are very seriously slot constrained.

Judging by what we know about the A380's performance, the market's behavior thus far, and other factors, that 20-per year figure looks reasonable, if generous. That means 400 planes over 20 years. ILFC's Steven Udvar-Hazy, who arguably knows more about aircraft competitiveness than anyone else, has estimated A380 demand at "300-400 at best."

Yet this figure assumes the A380 performs as promised. If the aircraft's weight is even higher than advertised, its economics will be compromised. Customers might just walk away. Also, if either manufacturer builds a better large aircraft in 10-15 years, one with economics that are equal or superior to the current mid market planes, the A380 will exit the market.

Then there is the A380 program break even point question. Airbus maintains that the program turns profitable at about 270 aircraft. But breakeven is a function of volume **times price.** List prices mean nothing in this industry, and Airbus has not discussed its A380 program pricing assumptions (although by most accounts heavy discounting has been rampant).

Saying that a program breaks even at a certain volume point, without reference to assumed price, is like saying that a room measures 15 feet. Fifteen feet by what? We do not have the information necessary to gauge this program's economic success. Only Airbus can do that.

But we can say, in conclusion, that the A380's short- and medium-term fortunes are the victim of changing market dynamics. The A380's long-term fortunes are threatened by technological obsolescence.

Perhaps most of all, the A380 misinvestment has imperiled Airbus's standing in the crucial 200/400-seat market, which represents half the total jetliner market by value. Airbus needs to find resources to reinvent its standing in this enormous segment with the A350 XWB, and the A380's prolonged gestation is hobbling that effort. But that is another subject.

Exhibit 27

Appendix A–Top 20 747 Operators: Age Distribution of Current Fleet (Future A380 Operators in Gray)

	Airline	Type	No. of 747s in Service	Avg. Age	Age distribution of fleet (years) 0-5	6-10	11-15	16-20	21-25	25+
1	**Japan Airlines International**	Passenger	56	15	1	9	21	16	5	2
		Freight/ Cargo	16	12	2	-	1	1	4	4
2	**British Airways**	Passenger	57	12	-	25	15	17	-	-
3	**Korean Air**	Passenger	24	12	1	7	14	2	-	-
		Freight/ Cargo	20	6	13	5	-	2	-	-
4	**Air France KLM**	Passenger	26	14	5	4	12	3	2	-
		Combi/Mixed Pas	16	12	1	5	6	4	-	-
		Freight/ Cargo	15	11	8	-	-	4	2	1
5	**Singapore Airlines**	Freight/ Cargo	14	6	8	3	3	-	-	-
		Passenger	27	11	4	6	17	-	-	-
6	**Qantas**	Passenger	35	13	6	3	10	14	2	-
7	**Cathay Pacific**	Passenger	21	15	-	-	16	5	-	-
		Freight/ Cargo	18	16	3	1	2	3	1	4
8	**China Airlines**	Passenger	15	8	4	8	3	-	-	-
		Freight/ Cargo	18	4	14	4	-	-	-	-
9	**Northwest Airlines**	Passenger	20	15	2	4	-	10	-	2
		Freight/ Cargo	21	24	-	-	-	5	2	7
10	**United Airlines**	Passenger	30	11	-	18	6	6	-	-
11	**Lufthansa**	Passenger	29	13	1	11	7	10	-	-
12	**Saudi Arabian Airlines**	Passenger	23	19	1	4	-	5	13	-
		Freight/ Cargo	3	23	-	-	-	1	-	1
13	**Malaysian Airlines**	Passenger	17	10	3	6	8	-	-	-
		Freight/ Cargo	10	17	2	-	-	3	1	2
14	**ANA All Nipon Airways**	Passenger	23	12	-	5	15	3	-	-
15	**Atlas Air**	Freight/ Cargo	32	20	2	5	-	-	3	11
16	**Thai Airways International**	Passenger	20	11	4	5	6	5	-	-
17	**EVA Air**	Passenger	5	11	-	3	2	-	-	-
		Combi/Mixed Pas	10	10	-	2	8	-	-	-
		Freight/ Cargo	3	5	2	1	-	-	-	-
18	**Kallita Air**	Freight/ Cargo	30	30	-	-	-	-	2	14
19	**Cargolux**	Freight/Cargo	14	8	4	7	3	-	-	-
20	**Asiana Airlines**	Combi/ Mixed	6	13	-	2	4	-	-	-
		Freight	6	7	2	2	2	-	-	-
		Passenger	2	10	-	1	1	-	-	-

Source: Airclaims, Morgan Stanley Research

Exhibit 28

Appendix B–Top 20 Current 747 Operators: Outstanding Wide-body Orders (Future A380 Operators in Grey)

	Carrier		# of 747s In Service	Average Age (yrs)	Outstanding Widebody orders: Boeing 767	Boeing 787	Boeing 777	Boeing 747	Airbus A330	Airbus A340	Airbus A350	Airbus A380
1	Japan Airlines International	Freight	54	15	4	-	-	-	-	-	-	-
		Passenger	12	12	3	30	10	-	-	-	-	-
2	British Airways	Passenger	57	12	-	-	-	-	-	-	-	-
3	Korean Air	Freight	20	6	-	-	-	-	-	-	-	-
		Passenger	24	12	-	10	7	-	-	-	-	5
4	Air France KLM	Freight	15	11	-	-	5	1	-	-	-	-
		Combi/Mixed	16	12	-	-	-	-	-	-	-	-
		Passenger	26	14	-	-	9	-	5	-	-	10
5	Singapore Airlines	Freight	14	6	-	-	-	-	-	-	-	-
		Passenger	27	11	-	-	19	-	-	-	20	19
6	Qantas	Passenger	35	13	-	35	-	-	2	-	-	12
7	Cathay Pacific	Freight	14	16	-	-	-	6	-	-	-	-
		Passenger	21	15	-	-	19	-	6	-	-	-
8	China Airlines	Freight	18	4	-	-	-	1	-	-	-	-
		Passenger	15	8	-	-	-	1	5	-	-	-
9	Northwest Airlines	Freight	14	24	-	-	-	-	-	-	-	-
		Passenger	18	15	-	18	-	-	12	-	-	-
10	United Airlines	Passenger	30	11	-	-	-	-	-	-	-	-
11	Lufthansa	Passenger	29	13	-	-	-	-	-	7	-	15
12	Saudi Arabian Airlines	Freight	2	23	-	-	-	-	-	-	-	-
		Passenger	23	19	-	-	-	-	-	-	-	-
13	Malaysian Airlines	Freight	8	17	-	-	-	-	-	-	-	-
		Passenger	17	10	-	-	-	-	-	-	-	6
14	ANA All Nipon Airways	Freight	0	0	1	-	-	-	-	-	-	-
		Passenger	23	12	2	50	10	-	-	-	-	-
15	Atlas Air	Freight	21	20	-	-	-	-	-	-	-	-
16	Thai Airways International	Passenger	20	11	-	-	-	-	-	-	-	6
17	EVA Air	Freight	3	5	-	-	-	-	-	-	-	-
		Combi/Mix	10	10	-	-	-	-	-	-	-	-
		Passenger	5	11	-	-	12	-	-	-	-	-
18	Kallita Air	Freight	16	30	-	-	-	-	-	-	-	-
19	Cargolux	Freight	14	8	-	-	-	12	-	-	-	-
20	Asiana Airlines	Freight	6	7	-	-	-	-	-	-	-	-
		Combi/Mix	6	13	-	-	-	-	-	-	-	-
		Passenger	2	10	-	-	3	-	2	-	-	-

Source: Airclaims, Morgan Stanley Research

Exhibit 29

EADS: Operating Forecast Summary and Key Valuation Metrics

€mn	2002A	2003A	2004A	2005A	2006e	2007e	2008e	2009e	2010e
Sales	29,901	30,133	31,761	34,206	37,767	38,702	41,370	42,422	42,918
EBIT	1,339	1,357	2,360	2,627	3,000	3,443	3,455	3,240	3,018
Pension interest in EBIT	187	208	202	210	185	185	184	183	181
Adj. EBIT	1,526	1,565	2,562	2,837	3,185	3,628	3,638	3,423	3,199
NOPAT	992	1,017	1,665	1,844	2,070	2,358	2,365	2,225	2,080
Adj. EBITDA	2,562	2,936	3,764	4,350	4,726	5,277	5,441	5,281	5,112
MW Net Income	(467)	152	1,030	1,387	1,564	1,919	2,018	1,983	1,915
Consol. Free Cash Flow	(1,962)	54	1,405	2,031	472	888	1,661	1,716	1,573
EPS (€)	0.52	0.90	1.51	1.73	1.94	2.39	2.50	2.45	2.40
FCF per share (€)	(2.44)	0.07	1.75	2.54	0.59	1.10	2.06	2.12	1.97
DPS (€)	0.50	0.30	0.40	0.49	0.68	0.72	0.75	0.79	0.83
Payout Ratio (%)	97	33	26	29	35	30	30	32	35
Margins									
EBIT Margin (%)	5.1	5.2	8.1	8.3	8.4	9.4	8.8	8.1	7.5
EBITDA Margin (%)	8.6	9.7	11.9	12.7	12.5	13.6	13.2	12.4	11.9
Capital Structure									
Average Share Price (€)	14.22	10.78	21.39	23.60	23.60	23.60	23.60	23.60	23.60
Diluted Shares Outs.	804	801	804	800	807	804	806	808	797
Market Capitalisation	11,435	8,634	17,199	18,885	19,039	18,983	19,027	19,063	18,814
Debt	3,830	4,767	5,126	5,097	4,997	4,897	4,797	4,697	4,597
Gov. Launch Aid	4,265	4,851	5,119	4,950	4,779	4,587	4,356	4,105	3,801
Cash & Equivalents	(6,200)	(7,872)	(9,477)	(10,720)	(9,995)	(9,919)	(10,582)	(11,345)	(11,886)
Unfunded PBO	3,755	4,116	3,608	4,097	4,134	4,168	4,199	4,226	4,249
Net Debt	5,650	5,862	4,376	3,424	3,915	3,733	2,770	1,684	762
Minorities	2,500	2,500	3,000	2,732	2,895	3,017	3,149	3,302	3,554
Unconsolidated Assets	2,500	2,800	2,868	2,628	2,628	2,628	2,628	2,628	2,628
Enterprise Value	17,085	14,196	21,707	22,413	23,221	23,105	22,318	21,421	20,501
Capital Employed									
Net Debt	5,650	5,862	4,376	3,424	3,915	3,733	2,770	1,684	762
Minorities	2,500	2,500	3,000	2,732	2,895	3,017	3,149	3,302	3,554
Total Equity	12,765	16,149	16,973	13,726	13,978	14,279	14,801	15,691	16,786
Total Capital Employed	18,657	22,684	23,177	22,157	23,231	23,315	22,709	22,317	22,252
Economic Profit									
ROE (%)	-3.7	0.9	6.1	10.1	11.2	13.4	13.6	12.6	11.4
ROCE (%)	6.0	5.1	7.2	8.3	8.9	10.1	10.4	10.0	9.3
WACC (%)	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6
Spread (%)	-2.6	-3.5	-1.4	-0.3	0.3	1.5	1.8	1.4	0.7
EVA	(482)	(789)	(329)	(62)	72	352	411	305	165
Valuation Ratios									
EV/Sales	NA	NA	0.7	0.7	0.6	0.6	0.5	0.5	0.5
EV/EBITA	NA	NA	8.5	7.9	7.0	6.2	6.1	6.3	6.4
EV/EBITDA	NA	NA	5.8	5.2	4.9	4.4	4.1	4.1	4.0
EV/Invested Capital	NA	NA	0.9	1.0	1.0	1.0	1.0	1.0	0.9
P/E	27.6	12.0	14.2	13.6	12.2	9.9	9.4	9.6	9.8
Dividend Yield (%)	3.5	2.8	1.9	2.1	2.9	3.0	3.2	3.3	3.5
P/FCF	NA	NA	10.2	8.0	34.7	18.4	9.9	9.6	10.3
Leverage									
Net Debt/ Mkt Cap (%)	49.4	67.9	25.4	18.1	20.6	19.7	14.6	8.8	4.0
Net Debt/EBITDA	2.2	2.0	1.2	0.8	0.8	0.7	0.5	0.3	0.1

Source: Company data, Morgan Stanley Research

Exhibit 30

EADS: 2007e Fair Market Value

	Commercial	Defence			Value		EBITA		Multiple		'06-10E
(in millions €)	Aircraft	& Other	HQ	Total	€per share	% of total	2007E	2008E	2007E	2008E	CAGR
Airbus 100%	18,491			18,491	€22.99	64	2,612	2,460	7.1	7.5	-7.6%
MBDA 50%		1,312		1,312	€1.63	5	134	139	9.8	9.4	3.6%
Defence Systems & Security		1,683		1,683	€2.09	6	204	243	8.2	6.9	8.0%
Eurocopter		3,798		3,798	€4.72	13	289	340	13.2	11.2	13.7%
Aeronautics & Other		485		485	€0.60	2	20	59	24.4	8.2	NM
Space		2,227		2,227	€2.77	8	140	166	15.9	13.4	13.4%
Military Transport		735		735	€0.91	3	72	76	10.3	9.7	1.1%
Total	**18,491**	**10,240**		**28,731**	**€35.72**	**100**	**3,471**	**3,483**	**8.3**	**8.2**	**0.2%**
Unconsolidated Assets											
Dassault Aviation			2,378	2,378	€2.96						
Embrear & Other			250	250	€0.31						
Total Unconsolidated Assets			**2,628**	**2,628**	**€3.27**						
Long-term debt	-		(4,897)	(4,897)							
Refundable government launch support	(4,100)	(487)		(4,587)							
Unfunded pensions & PBO, net of tax	-		(3,410)	(3,410)							
Cash	-		9,919	9,919							
Net Debt	**(4,100)**	**(487)**	**1,612**	**(2,975)**	**-€3.70**						
Minority Interests											
Airbus 20%	(2,878)			(2,878)							
MBDA 12.5%		(164)		(164)							
Total Minorities	**(2,878)**	**(164)**		**(3,042)**	**-€3.78**						
Equity Value	**11,513**	**9,589**	**4,240**	**25,342**	**€31.51**						
2006E Diluted shares outstanding	804	804	804	804							
Value per share	€14.31	€11.92	€5.27	**€31.51**	**8.6%**						

Source: Morgan Stanley Research,

e=Morgan Stanley Research Estimate

Exhibit 31

FCF Valuation Analysis, 2004-2012e

(in millions €)	2004	2005	2006E	2007E	2008E	2009E	2010E	2011E	2012E
Forecast Airbus Deliveries	320	378	431	452	477	483	469	450	430
EBITDA pre-R&D	5,890	6,215	6,735	7,413	7,907	7,817	7,620	7,457	7,658
Research & development	(2,126)	(2,075)	(2,194)	(2,321)	(2,649)	(2,719)	(2,689)	(2,705)	(2,571)
Industrial capital expenditures & capitalised R&D	(3,017)	(2,818)	(2,687)	(2,351)	(2,123)	(2,034)	(2,094)	(2,021)	(1,850)
Net interest expense & customer financing income	(330)	(155)	(133)	(129)	(27)	26	83	132	169
Cash taxes	(302)	(439)	(714)	(970)	(1,005)	(1,038)	(1,050)	(999)	(1,119)
Decrease (increase) in working capital	2,148	1,389	(757)	(515)	(33)	143	152	88	44
Change in provisions	(237)	238	(50)	(25)	(25)	(25)	(25)	(25)	(25)
Cash outflows to minorities	(64)	(150)	23	(170)	(191)	(264)	(236)	(213)	(263)
FCF pre customer financing	**1,962**	**2,205**	**223**	**934**	**1,853**	**1,907**	**1,761**	**1,714**	**2,042**
Increase (decrease) in customer financing	(557)	(174)	249	(46)	(192)	(191)	(189)	(185)	(186)
Free Cash Flow	**1,405**	**2,031**	**472**	**888**	**1,661**	**1,716**	**1,573**	**1,529**	**1,856**
Adj FCF	(743)	642	1,229	1,402	1,694	1,572	1,420	1,441	1,813
Diluted shares	804.1	800.2	806.7	804.4	806.2	807.7	797.2	787.6	779.0
FCF/share	€1.75	€2.54	€0.59	€1.10	€2.06	€2.12	€1.97	€1.94	€2.38
Adj. FCF/share (ex. Working capital)	-€0.92	€0.80	€1.52	€1.74	€2.10	€1.95	€1.78	€1.83	€2.33
EADS current share price				23.23					
Investments per share				(3.27)					
Net share price				19.96					
FCF/share multiple				18.1	9.7	9.4	10.1		
FCF yield (%)				6	10	11	10		
Target value				€26.04	€28.65	€31.51	€34.66	€38.13	
Target FCF/share multiple				12.6	13.5	16.0	17.9	16.0	
Assumed Required Return on Equity									
Target value of consolidated operations				€26.04					
+ Unconsolidated assets/share				€3.27					
Target Value				**€29.31**					

Source: Company data, Morgan Stanley Research

Morgan Stanley
ModelWare℠

ModelWare is Morgan Stanley's new system for helping investors and analysts to uncover value, free from the distortions and ambiguities created by accounting data. Morgan Stanley has dissected and fundamentally redefined the components of corporate valuation, giving clients more consistent definitions, more comparable data, and more flexible analytic tools. ModelWare makes investment insights easier by making value more visible.

Past inconsistencies in financial reporting made it difficult to compare performance among companies and across sectors and regions. Even within US GAAP, flexibility complicates comparisons. And accounting standards were developed to analyze historical data, not to facilitate projections. In response, Morgan Stanley analysts spent two years reviewing our entire coverage universe of company metrics. They defined more than 2,000 general and industry-specific metrics that eliminated inconsistencies stemming from regional differences, historical precedents and accounting conventions. The team applied these metrics across also all 1900+ companies we cover, and created flexible tools and services that let analysts redefine and use the data with maximum creativity. Because ModelWare provides complete transparency, users see every component of every calculation, to choose elements or recombine them as they wish.

ModelWare EPS illustrates the approach. It represents ModelWare EPS as ModelWare net income divided by average fully diluted shares outstanding. ModelWare net income sums net operating profit after tax (NOPAT), net financial income or expense (NFE) and other income or expense. ModelWare adjusts reported net income to improve comparability across companies, sectors and regions. Among these adjustments: We exclude goodwill amortization and items deemed by analysts to be "one-time" events; we capitalize operating leases where their use is significant (e.g., in transportation and retail); and we convert inventory to FIFO accounting when LIFO costing is used. For more information on these adjustments and others, as well as additional background, please see *Morgan Stanley ModelWare (ver. 1.0): A Road Map for Investors*, by Trevor Harris and team, August 2, 2004.

Disclosure Section

Morgan Stanley & Co. International Limited, authorised and regulated by Financial Services Authority, disseminates in the UK research that it has prepared, and approves solely for the purposes of section 21 of the Financial Services and Markets Act 2000, research which has been prepared by any of its affiliates.

Analyst Certification

The following analysts hereby certify that their views about the companies and their securities discussed in this report are accurately expressed and that they have not received and will not receive direct or indirect compensation in exchange for expressing specific recommendations or views in this report: Scott Babka.

Unless otherwise stated, the individuals listed on the cover page of this report are research analysts.

Global Research Conflict Management Policy

This research has been published in accordance with our conflict management policy, which is available at www.morganstanley.com/institutional/research/conflictpolicies.

Important US Regulatory Disclosures on Subject Companies

As of July 31, 2006, Morgan Stanley beneficially owned 1% or more of a class of common equity securities of the following companies covered in this report: BAE SYSTEMS, Rolls-Royce, Smiths Group.

As of July 31, 2006, Morgan Stanley held a net long or short position of US$1 million or more of the debt securities of the following issuers covered in this report (including where guarantor of the securities): BAE SYSTEMS, EADS, Rolls-Royce.

Within the last 12 months, Morgan Stanley has received compensation for investment banking services from BAE SYSTEMS, EADS, Smiths Group.

In the next 3 months, Morgan Stanley expects to receive or intends to seek compensation for investment banking services from BAE SYSTEMS, EADS, Rolls-Royce, Safran, Smiths Group.

Within the last 12 months, Morgan Stanley & Co. Incorporated has received compensation for products and services other than investment banking services from BAE SYSTEMS, EADS, Rolls-Royce, Smiths Group.

Within the last 12 months, Morgan Stanley has provided or is providing investment banking services to, or has an investment banking client relationship with, the following companies covered in this report: BAE SYSTEMS, EADS, Rolls-Royce, Safran, Smiths Group.

Within the last 12 months, Morgan Stanley has either provided or is providing non-investment banking, securities-related services to and/or in the past has entered into an agreement to provide services or has a client relationship with the following companies covered in this report: BAE SYSTEMS, EADS, Rolls-Royce, Smiths Group.

The research analysts, strategists, or research associates principally responsible for the preparation of this research report have received compensation based upon various factors, including quality of research, investor client feedback, stock picking, competitive factors, firm revenues and overall investment banking revenues.

Certain disclosures listed above are also for compliance with applicable regulations in non-US jurisdictions.

STOCK RATINGS

Different securities firms use a variety of rating terms as well as different rating systems to describe their recommendations. For example, Morgan Stanley uses a relative rating system including terms such as Overweight, Equal-weight or Underweight (see definitions below). A rating system using terms such as buy, hold and sell is not equivalent to our rating system. Investors should carefully read the definitions of all ratings used in each research report. In addition, since the research report contains more complete information concerning the analyst's views, investors should carefully read the entire research report and not infer its contents from the rating alone. In any case, ratings (or research) should not be used or relied upon as investment advice. An investor's decision to buy or sell a stock should depend on individual circumstances (such as the investor's existing holdings) and other considerations.

Global Stock Ratings Distribution

(as of August 31, 2006)

For disclosure purposes only (in accordance with NASD and NYSE requirements), we include the category headings of Buy, Hold, and Sell alongside our ratings of Overweight, Equal-weight and Underweight. Morgan Stanley does not assign ratings of Buy, Hold or Sell to the stocks we cover. Overweight, Equal-weight, and Underweight are not the equivalent of buy, hold, and sell but represent recommended relative weightings (see definitions below). To satisfy regulatory requirements, we correspond Overweight, our most positive stock rating, with a buy recommendation; we correspond Equal-weight and Underweight to hold and sell recommendations, respectively.

	Coverage Universe		Investment Banking Clients (IBC)		
Stock Rating Category	Count	% of Total	Count	% of Total IBC	% of Rating Category
Overweight/Buy	**784**	**39%**	**294**	**44%**	**38%**
Equal-weight/Hold	**888**	**44%**	**297**	**45%**	**33%**
Underweight/Sell	**332**	**17%**	**74**	**11%**	**22%**
Total	**2,004**		**665**		

Data include common stock and ADRs currently assigned ratings. An investor's decision to buy or sell a stock should depend on individual circumstances (such as the investor's existing holdings) and other considerations. Investment Banking Clients are companies from whom Morgan Stanley or an affiliate received investment banking compensation in the last 12 months.

Analyst Stock Ratings

Overweight (O). The stock's total return is expected to exceed the average total return of the analyst's industry (or industry team's) coverage universe, on a risk-adjusted basis, over the next 12-18 months.

Equal-weight (E). The stock's total return is expected to be in line with the average total return of the analyst's industry (or industry team's) coverage universe, on a risk-adjusted basis, over the next 12-18 months.

Underweight (U). The stock's total return is expected to be below the average total return of the analyst's industry (or industry team's) coverage universe, on a risk-adjusted basis, over the next 12-18 months.

More volatile (V). We estimate that this stock has more than a 25% chance of a price move (up or down) of more than 25% in a month, based on a quantitative assessment of historical data, or in the analyst's view, it is likely to become materially more volatile over the next 1-12 months compared with the past three years. Stocks with less than one year of trading history are automatically rated as more volatile (unless otherwise noted). We note that securities that we do not currently consider "more volatile" can still perform in that manner.

Unless otherwise specified, the time frame for price targets included in this report is 12 to 18 months.

Analyst Industry Views

Attractive (A): The analyst expects the performance of his or her industry coverage universe over the next 12-18 months to be attractive vs. the relevant broad market benchmark, as indicated below.

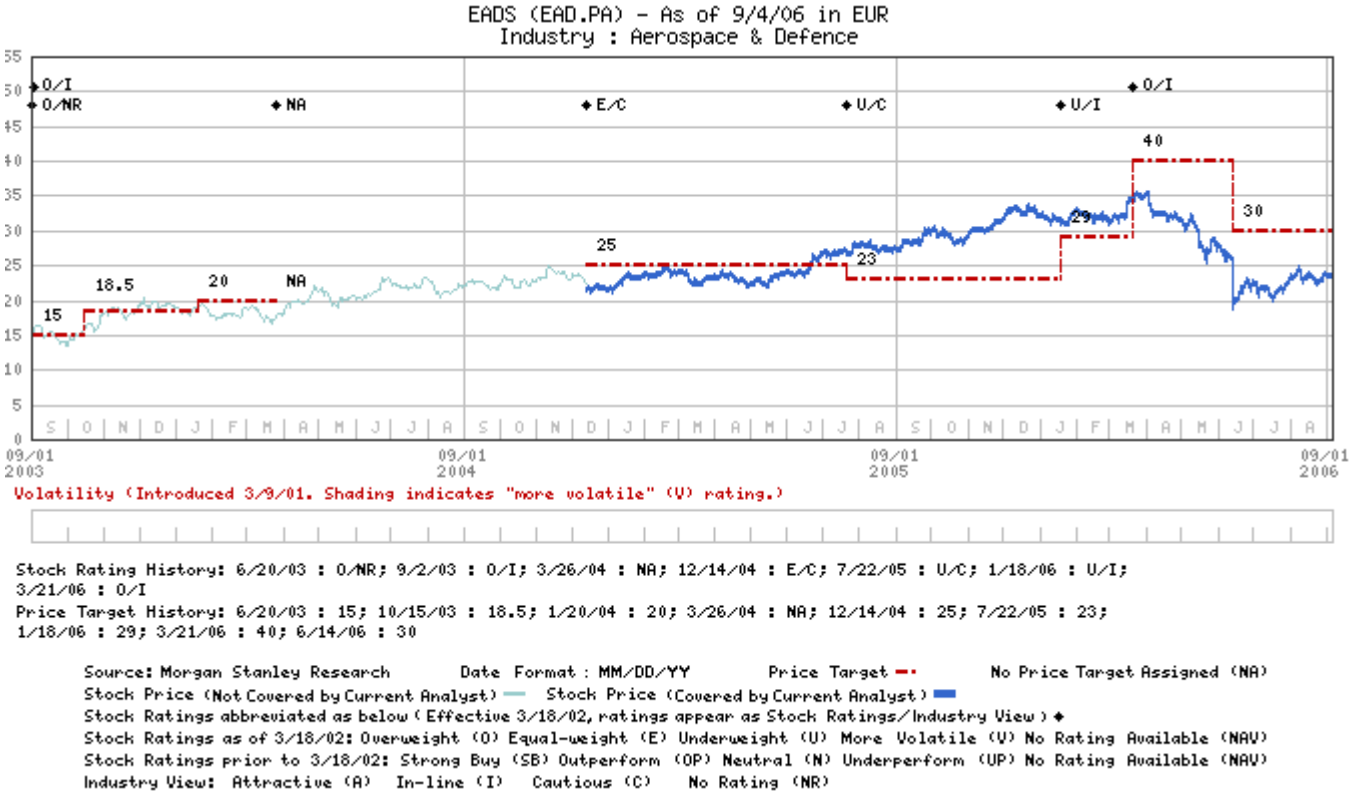
In-Line (I): The analyst expects the performance of his or her industry coverage universe over the next 12-18 months to be in line with the relevant broad market benchmark, as indicated below.

Cautious (C): The analyst views the performance of his or her industry coverage universe over the next 12-18 months with caution vs. the relevant broad market benchmark, as indicated below.

Benchmarks for each region are as follows: North America - S&P 500; Latin America - relevant MSCI country index; Europe - MSCI Europe; Japan - TOPIX; Asia - relevant MSCI country index.

Stock price charts and rating histories for companies discussed in this report are available at www.morganstanley.com/companycharts or from your local investment representative. You may also request this information by writing to Morgan Stanley at 1585 Broadway, (Attention: Equity Research Management), New York, NY, 10036 USA.

Stock Price, Price Target and Rating History (See Rating Definitions)



Stock Rating History: 6/20/03 : O/NR; 9/2/03 : O/I; 3/26/04 : NA; 12/14/04 : E/C; 7/22/05 : U/C; 1/18/06 : U/I; 3/21/06 : O/I
Price Target History: 6/20/03 : 15; 10/15/03 : 18.5; 1/20/04 : 20; 3/26/04 : NA; 12/14/04 : 25; 7/22/05 : 23; 1/18/06 : 29; 3/21/06 : 40; 6/14/06 : 30

Source: Morgan Stanley Research Date Format : MM/DD/YY Price Target No Price Target Assigned (NA)
Stock Price (Not Covered by Current Analyst) Stock Price (Covered by Current Analyst)
Stock Ratings abbreviated as below (Effective 3/18/02, ratings appear as Stock Ratings/Industry View) ♦
Stock Ratings as of 3/18/02: Overweight (O) Equal-weight (E) Underweight (U) More Volatile (V) No Rating Available (NAV)
Stock Ratings prior to 3/18/02: Strong Buy (SB) Outperform (OP) Neutral (N) Underperform (UP) No Rating Available (NAV)
Industry View: Attractive (A) In-line (I) Cautious (C) No Rating (NR)

Other Important Disclosures

For a discussion, if applicable, of the valuation methods used to determine the price targets included in this summary and the risks related to achieving these targets, please refer to the latest relevant published research on these stocks. Research is available through your sales representative or on Client Link at www.morganstanley.com and other electronic systems.

This report does not provide individually tailored investment advice. It has been prepared without regard to the individual financial circumstances and objectives of persons who receive it. The securities discussed in this report may not be suitable for all investors. Morgan Stanley recommends that investors independently evaluate particular investments and strategies, and encourages investors to seek the advice of a financial adviser. The appropriateness of a particular investment or strategy will depend on an investor's individual circumstances and objectives. The securities, instruments, or strategies discussed in this report may not be suitable for all investors, and certain investors may not be eligible to purchase or participate in some or all of them.

This report is not an offer to buy or sell or the solicitation of an offer to buy or sell any security or to participate in any particular trading strategy. The "Important US Regulatory Disclosures on Subject Companies" section lists all companies mentioned in this report where Morgan Stanley owns 1% or more of a class of common securities of the companies. For all other companies mentioned in this report, Morgan Stanley may have an investment of less than 1% in securities or derivatives of securities of companies mentioned in this report, and may trade them in ways different from those discussed in this report. Employees of Morgan Stanley not involved in the preparation of this report may have investments in securities or derivatives of securities of companies mentioned in this report, and may trade them in ways different from those discussed in this report. Derivatives may be issued by Morgan Stanley or associated persons.

Morgan Stanley & Co. Incorporated and its affiliate companies do business that relates to companies covered in its research reports, including market making and specialized trading, risk arbitrage and other proprietary trading, fund management, investment services and investment banking. Morgan Stanley sells to and buys from customers the securities/instruments of companies covered in its research reports on a principal basis.

With the exception of information regarding Morgan Stanley, reports prepared by Morgan Stanley research personnel are based on public information. Morgan Stanley makes every effort to use reliable, comprehensive information, but we make no representation that it is accurate or complete. We have no obligation to tell you when opinions or information in this report change apart from when we intend to discontinue research coverage of a subject company. Facts and views presented in this report have not been reviewed by, and may not reflect information known to, professionals in other Morgan Stanley business areas, including investment banking personnel.

Morgan Stanley research personnel conduct site visits from time to time but are prohibited from accepting payment or reimbursement by the company of travel expenses for such visits.

The value of and income from your investments may vary because of changes in interest rates or foreign exchange rates, securities prices or market indexes, operational or financial conditions of companies or other factors. There may be time limitations on the exercise of options or other rights in your securities transactions. Past performance is not necessarily a guide to future performance. Estimates of future performance are based on assumptions that may not be realized. Unless otherwise stated, the cover page provides the closing price on the primary exchange for the subject company's securities.

To our readers in Taiwan: Information on securities that trade in Taiwan is distributed by Morgan Stanley & Co. International Limited, Taipei Branch (the "Branch"). Such information is for your reference only. The reader should independently evaluate the investment risks and is solely responsible for their investment decisions. This publication may not be distributed to the public media or quoted or used by the public media without the express written consent of Morgan Stanley. Information on securities that do not trade in Taiwan is for informational purposes only and is not to be construed as a recommendation or a solicitation to trade in such securities. The Branch may not execute transactions for clients in these securities.

To our readers in Hong Kong: Information is distributed in Hong Kong by and on behalf of, and is attributable to, Morgan Stanley Dean Witter Asia Limited as part of its regulated activities in Hong Kong. If you have any queries concerning this publication, please contact our Hong Kong sales representatives.

This publication is disseminated in Japan by Morgan Stanley Japan Securities Co., Ltd.; in Hong Kong by Morgan Stanley Dean Witter Asia Limited (which accepts responsibility for its contents); in Singapore by Morgan Stanley Dean Witter Asia (Singapore) Pte. (Registration number 199206298Z) and/or Morgan Stanley Asia (Singapore) Securities Pte Ltd (Registration number 200008434H), regulated by the Monetary Authority of Singapore, which accepts responsibility for its contents; in Australia by Morgan Stanley Dean Witter Australia Limited A.B.N. 67 003 734 576, holder of Australian financial services licence No. 233742, which accepts responsibility for its contents; in Korea by Morgan Stanley & Co International Limited, Seoul Branch; in India by JM Morgan Stanley Securities Private Limited; in Canada by Morgan Stanley Canada Limited, which has approved of, and has agreed to take responsibility for, the contents of this publication in Canada; in Germany by Morgan Stanley Bank AG, Frankfurt am Main, regulated by Bundesanstalt fuer Finanzdienstleistungsaufsicht (BaFin); in Spain by Morgan Stanley, S.V., S.A., a Morgan Stanley group company, which is supervised by the Spanish Securities Markets Commission (CNMV) and states that this document has been written and distributed in accordance with the rules of conduct applicable to financial research as established under Spanish regulations; in the United States by Morgan Stanley & Co. Incorporated and Morgan Stanley DW Inc., which accept responsibility for its contents. Morgan Stanley & Co. International Limited, authorized and regulated by Financial Services Authority, disseminates in the UK research that it has prepared, and approves solely for the purposes of section 21 of the Financial Services and Markets Act 2000, research which has been prepared by any of its affiliates. Private U.K. investors should obtain the advice of their Morgan Stanley & Co. International Limited representative about the investments concerned. In Australia, this report, and any access to it, is intended only for "wholesale clients" within the meaning of the Australian Corporations Act.

Morgan Stanley research is disseminated and available primarily electronically, and, in some cases, in printed form.

Additional information on recommended securities is available on request.

The Americas
1585 Broadway
New York, NY 10036-8293
United States
Tel: +1 (1) 212 761 4000

Europe
25 Cabot Square, Canary Wharf
London E14 4QA
United Kingdom
Tel: +44 (0) 20 7 425 8000

Japan
4-20-3 Ebisu, Shibuya-ku
Tokyo 150-6008
Japan
Tel: +81 (0) 3 5424 5000

Asia/Pacific
Three Exchange Square
Central
Hong Kong
Tel: +852 2848 5200

Industry Coverage:Aerospace & Defence

Company (Ticker)	Rating (as of)	Price (09/04/2006)
Scott Babka, CFA		
BAE SYSTEMS (BA.L)	O (02/15/2006)	378p
EADS (EAD.PA)	O (03/21/2006)	€23.08
Rolls-Royce (RR.L)	E (02/15/2006)	447p
Safran (SAF.PA)	E (07/12/2006)	€17.35
Smiths Group (SMIN.L)	E (01/18/2006)	875p

Stock Ratings are subject to change. Please see latest research for each company.