Airbus 350 vs Boeing 787
Battle for the Skies

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Airbus 350 vs. Boeing 787 – Battle for the Skies

Aircraft manufacturers Airbus and Boeing have been the main players in the aviation industry for a long period of time. To compete with Boeing’s successful aircraft 787, in 2007, Airbus planned to launch a larger aircraft – the A350 XWB. Airbus is facing difficulties in trying to combat its competitor, Boeing. Though Boeing's 787 gained the maximum number of orders almost from every major airliner, the Paris Air Show held between June 18th and June 21st of 2007, indicated that Airbus A350 XWB is proving to be a stiff competition to the Dreamliner. Boeing intends to launch its Dreamliner by 2008, with which it aims to be the fastest selling commercial aircraft in the history of aviation. However, the demand for the aircrafts prompted many other airliners to enter this market, who might challenge the existing duopoly of Airbus and Boeing, which they have retained over the decades. With the increasing competition from Russia, China and Japan, analysts observe that the dominance of the two seem to be in jeopardy.

History of Airbus and Boeing

The Civil aviation and aircraft manufacturing industry is mainly concentrated in the United States and Europe. It is dominated by Airbus backed by the European Union (EU) and Boeing by the US government. The trade disputes between EU and US takes precedence in the fight between the two companies. Headquartered in Chicago, Illinois, USA, Boeing was founded by William Edward Boeing in 1916. With no competition, till the 1970s, the US enjoyed a monopoly in the civil aircraft sector. Boeing has been dominating the industry since its inception. However, the formation of Airbus' in 1970 challenged its monopoly. Airbus was established to compete with the American aircraft manufacturing companies like Boeing, McDonnell Douglas and Lockheed. Airbus is the aircraft-manufacturing unit of European Aeronautic Defence and Space Co. (EADS), with its headquarters at Toulouse, France. It has its dominance in European countries and is one of the two big players in the commercial aircraft-manufacturing industry. Airbus has around 57,000 employees in 16 sites in Germany, France, UK and Spain. It outsources its work to US, Japan and China but the final assembly production takes place in Toulouse (France) and Hamburg (Germany). Both Airbus and Boeing are equipped in manufacturing similar aircrafts like the single aisle, long range and wide-body aircrafts.

The competition caused concerns for the US, as it did not want its monopoly jeopardised. The main cause of the dispute between Airbus and Boeing has been aircraft subsidies. The issue of subsidy has not only caused disputes, but has also brought in drastic changes in the aircraft industry. On one side, Boeing countered by alleging that Airbus was being paid subsidies by the EU and the EU in turn alleged Boeing of availing subsidies from the US government. To end the tiff between the two, in 1992, both the companies signed a bilateral agreement which was over the years ignored and bypassed by both Boeing and Airbus.

In 2003, the dispute was further triggered when for the first time Airbus, sold more planes than Boeing [Exhibit I] and the same continued in 2004. Despite Airbus' consistent growth over time, Boeing remained the global market leader with 80% of large aircraft in service.

1 McDonnell Douglas was a major American aerospace manufacturer and defense contractor, producing a number of famous commercial and military aircraft. It merged with Boeing in 1997 to form The Boeing Company.
2 Lockheed Corporation was an American aerospace company founded in 1912 which merged with Martin Marietta in 1995 to form Lockheed Martin.
5 In the late 1980s, the EU and the US started bilateral negotiations for the limitation of government subsidies to the Large Civil Aircraft sector. Negotiations were concluded in 1992 with the signature of the EC-US Agreement on Trade in Large Civil Aircraft which imposes discipline on both governments. The Agreement regulates in detail the forms and limits of government support, prescribes transparency obligations and ensures avoiding the trade disputes between the parties.
In 2004, Boeing filed a complaint against Airbus with the World Trade Organization (WTO), for violating the 1992 bilateral EU-US agreement, which was subject to regulations for large civil aircraft support from the respective governments. Boeing accused Airbus of receiving ‘unfair’ subsidies from the European Union (EU). In response, Airbus also filed a complaint against Boeing, stating that it has been receiving ‘unfair’ tax reductions from the US government and investment subsidies from the Japanese airliners, thus violating the agreement. In January 2005, both the companies decided to find a solution for the dispute without WTO’s help. But in June 2005, both Airbus and Boeing again filed complaint against each other regarding the subsidies received from their respective governments.

7 “Civil Aircraft Sector”, http://ec.europa.eu/trade/issues/sectoral/industry/aircraft/index_en.htm
Airbus and Boeing had been strong contenders in the aircraft industry for many years. The question of aircraft demand in the industry has always depended on the Airbus-Boeing dispute. Airbus has traditionally been in stiff competition with Boeing year after year for aircraft orders, though the competition between them has not always been head-to-head. Each responds to the demand of the market with models either smaller or bigger than the other, in order to gain a competitive edge. It was evident with their previous models – A380 was designed a little larger than Boeing 747, and the A320 is larger than Boeing’s 737-700 but smaller than Boeing’s 737-800, its direct competitor. Airliners all over the world are the biggest benefactors from the competition between Airbus and Boeing as they could choose aircrafts ranging from 100 seat aircrafts to 500 seat aircrafts, instead of opting for similar models. Though there are 4,463 Airbus aircrafts in service, Boeing outnumbered its competitors 6 times the number which Airbus had still in service.\(^9\) However, Airbus had a greater share of orders in 2003, 2004 and 2005 with 1,111 orders as compared to 1,002 of Boeing [Exhibit II]. Based on this intense size-led competition, both the companies launched 787 Dreamliner and A350 XWB in 2005 and 2007 respectively.

Exhibit II
Aircraft Orders for Boeing and Airbus During 2000-2006

Compiled by the author from:

Boeing 787 vs Airbus 350

Although Boeing introduced the Dreamliner in 2003, it was launched in 2005.10 Boeing’s attempt to address the 200-300-seat aircraft segment prompted the introduction of the 787 in the market. The Boeing 787 Dreamliner is a long-range, mid-sized, wide-body, twin-engine passenger airliner. According to Randy Tinseth, vice president, marketing, for commercial airplanes, “I think any time you bring a new model in – such as the 787-9, which is a little larger than the 767-300 – you get a situation where the market-space occupied by each airplane becomes more defined. But when we were developing 787 family, we were always thinking about the 777’s capability, and we were looking at making 787 a complement rather than a competitor.”11 In June 2006, the assembling of the 787 aircraft began. According to Boeing’s spokesperson, “Interchangeability is a big economic advantage for commercial jetliner owners and operators. The Dreamliner is designed to carry passengers for at least 30 years. During that period, interior styles will likely change several times. Seats, lavatories, galleys – and especially in-flight entertainment systems – will be upgraded or replaced several times as well. When an airplane is sold or leased, the new operator will want to redo the cabin in the colors and patterns of the airline’s brand identity.”12

12 Ibid.
According to Marty Bentrott, vice president of sales for Boeing 787, “Our strategy has been to design and build an airplane that will take passengers where they want to go, when they want to go, without intermediate stops; do it efficiently while providing the utmost comfort to passengers; and make it simple and cost-effective for airlines to operate.” The design team of the Dreamliner worked with the cabin component suppliers and developed standard mounts and interfaces that enable quicker and economical modifications. Boeing planned it in such a way that the aircraft owners could expect higher lease and resale value throughout its lifecycle. As compared to earlier aircrafts, this model is a lighter aircraft that was built using a composite material. Its fuel efficiency also gave an edge for the model’s saleability. Keeping in view both the environmental factors and the comfort of the passengers, Boeing designed engines that reduced noise pollution. It also claims that the 787 Dreamliner is “the most advanced and efficient airplane in its class, one that will set new standards for environmental leadership and passenger comfort.”

To compete with Boeing’s Dreamliner, Airbus planned to launch its A350 XWB in 2007. The design of the A350 is an improvised version of the A330. When the launch of 787 was announced, Boeing claimed that the low operating cost of the A330 would pose a threat to its aircraft. And yet, Boeing continued with its production and ignored the threat. On the contrary, the sales of A330 were hampered with the introduction of Boeing’s 787. Due to the hampering of sales, Airbus decided to launch A350, a wide body aircraft derived from the existing design of A330. This strategy backfired, as customers did not favour the design. In 2006, in response to criticisms from its customers – ILFC, GECAS and Singapore Airlines, Airbus decided to have a wider fuselage as the earlier one could accommodate only eight passengers in a row as against nine passengers on the 787. Modifications were also done in the aircraft with larger wings, more powerful engines and higher cruise speed. Airbus modified its earlier model and presented the new A350 XWB in 2007. The new designs of A350 has a wider fuselage with a diameter of 31 cms as compared to A330 and Boeing’s 787, which had a fuselage with a diameter of 18cms-13 cms. The new design enabled Airbus to accommodate wider economy seats than Boeing. It also maximised the usable space by having a constant cross-section from door one to door four. The passenger windows in A350 were five cms wider as compared to A330. John Leahy (Leahy), the chief salesperson of Airbus claimed that it is the “widest on any airliner”. The company sources also affirm that the A350 would be less noisy than A330 and also provides fuel efficiency that is 4% to 5% per seat better than the 787. According to Leahy, “The new A350 engines are more advanced than 787 with thrust ranges between 75,000 and 95,000.” Expressing his opinion, Chew Choon Seng, CEO of Singapore Airlines, said, “It is heartening that Airbus has listened to customer airlines and has come up with a totally new design for the A350.”

Considering the demand for the aircrafts and seeking a wider market share as well, both the companies are targeting the Asia-Pacific region. According to Boeing’s 2005 Current Market Outlook forecasts, by 2025, a market of about 7,200 new airplanes worth $770 billion in the Asia-Pacific region will be the next largest

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15 ILFC (International Lease Finance Corporation), is an aircraft lessor headquartered in Los Angeles, California. It leases Boeing and Airbus aircraft to airlines worldwide including Air Canada, Air France-KLM, Lufthansa, American Airlines, Air India, Continental Airlines, Mexicana, Emirates Airlines, Vietnam Airlines, Vueling Airlines and Delta Air Lines.
16 GECAS (GE Commercial Aviation Services), is a unit of GE Commercial Finance. GECAS is responsible for the leasing of aircraft and associated equipment to airlines.
17 The fuselage is an aircraft’s main body section that holds crew and passengers or cargo. The fuselage also serves to position control and stabilisation surfaces in specific relationships to lifting surfaces, required for aircraft stability and maneuverability.
18 "King of the Sky: Boeing Dreamliner vs. Airbus A350 XWB", op.cit.
20 "King of the Sky: Boeing Dreamliner vs. Airbus A350 XWB", op.cit.
22 "King of the Sky: Boeing Dreamliner vs. Airbus A350 XWB", op.cit.
23 Ibid.
market outside North America. According to the report, Asia-Pacific’s fleet will nearly triple, to about 8,600 airplanes by the end of the forecast period. As per the forecast made by Airbus, between 2004-2023, unit demand for airplanes in the Asia-Pacific region will be of 5,515 new airplanes, with larger airplanes having a bigger portion of total deliveries. Airbus also expected that, by the end of its forecast period the airlines in the Asia-Pacific would operate 33% of the world’s passenger airplanes as compared to 29% of Europe and 26% of North America.

By April 2007, the companies in the Asia-Pacific region placed more than 500 orders for Boeing Dreamliner, including an order of five planes by Japan Airlines. According to Kunio Shimizu, vice president of Japan Airlines, “It will be our key airplane on international and domestic flights.”

In November 2007, post Dubai Airshow, Airbus won a $31-billion contract from Emirates, the biggest Arabian carrier and a $13.5-billion order from a leasing unit of the Dubai Aerospace Enterprise (DAE). Boeing also won a $13.7-billion order from DAE and an order worth $6.1 billion from Qatar Airways. Airbus also claimed to have secured 1,021 contracts by the end of October 2007 as compared to 956 contracts of Boeing. Dubai based Emirates placed an order for 70 A350s apart from 11 double-deck A380s. [Exhibit III]

At the same time, Boeing 787 Dreamliner is expected to outreach A350 in China as it has secured 60 orders from the Chinese airlines while Airbus could not secure a single order. According to Michael Bair, vice president and general manager of the 787 Program at Boeing Commercial Airplanes, “It’s a competitive market but Boeing is expected to take more than half of the market as we have advantage in timing.”

According to Robert Laird, vice president of Boeing, China sales, China has the world’s fastest growing airline industry and by 2026 will have an annual increase of 9% in passengers and an increase of 15% in cargo. According to him, “China needs 2,800 aircraft in the coming 20 years to replace existing airplanes and as airlines expand their fleets, Boeing is confident to take a major share of that.” Out of the 60 ordered, 57 orders are from various firms. Air China and China Eastern Airlines have ordered 15 aircrafts each, Hainan Airlines have ordered 8 aircrafts, Shanghai Airlines have ordered 9 aircrafts, and China Southern Airlines have ordered 10 aircrafts.

One huge market, which both Airbus and Boeing wished to tap, is the US. Till now only airlines in the Middle East and Asia have orders for the 787, but US legacy carriers are also showing interest in the 787. This helped boost Boeing’s confidence against the A350, which cost more than 787 and would not be

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25 Ibid.

26 Ibid.

27 “Boeing 787 sets record – it’s fastest-selling airliner”, http://www.sbac.co.uk/community/cms/content/preview/news_item_view.asp?i=16220&t=0, April 12th 2007

28 Dubai Aerospace Enterprise (DAE) was founded in Dubai in February 2006, and is providing products and services in six sectors spanning across various fields that include research and development, education, manufacturing, maintenance, repair & overhaul, aircraft leasing and other aerospace services.

29 Qatar Airways is the flag carrier airline of Qatar, based in Doha. It operates a hub and spoke network, linking 81 international destinations. It is one of only six airlines in the world with a five star ranking for service and excellence awarded by Skytrax, an independent aviation industry monitoring agency.


32 “Boeing 787 set to fly past rival A350 in China”, op.cit.

33 Ibid.

34 Ibid.

35 Referring to the airline industry, a legacy carrier is an airline revolving around a hub & spoke network and a corporate structure. In the US market, the term specifically refers to those airlines that existed prior to the Airline Deregulation Act of 1978.
US Airways have plans to order the A350, but Boeing is trying to persuade the airline to switch the order to its 787 instead.

### Exhibit III

Orders Received by Airbus and Boeing after the Dubai Airshow in 2007

<table>
<thead>
<tr>
<th>Airbus</th>
<th>Boeing</th>
</tr>
</thead>
<tbody>
<tr>
<td>A350</td>
<td>100</td>
</tr>
<tr>
<td>A380</td>
<td>11</td>
</tr>
<tr>
<td>A320</td>
<td>70</td>
</tr>
</tbody>
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|  | 747-8 | 5 |


### The Road Ahead

In 2007, US government accused Airbus of getting illegal aid for $100 billion from the European Union [Annexure I]. EU denied the claim and asked how finances received by Airbus hampered Boeing. In response, the US government said, “Subsidies have enabled Airbus to develop a full family of airliners, targeted at its US competitors. It is not tolerable that one producer should have ready access to billions of dollars in up-front, risk-free financing to develop airplanes.” The EU also had similar accusations against the US government for aiding Boeing’s 787 with $5 billion [Annexure II]. In defence of their aid, EU said that the US case against Airbus ignored relevant international agreements and is supported by incorrect facts. The dispute is at a key stage of the settlement process as both the parties have submitted a written allegation against one another in the WTO, detailing their legal arguments. According to some market analysts this trade dispute might also hamper both the companies’ future sales as China has announced its proposal to set up a company to build large passenger airplanes to compete with Airbus and Boeing.

According to Forecast International, a market research firm, 9,528 commercial aircrafts, worth $986 billion will be produced between 2007 and 2016. It also predicts that Boeing will build 56% of those aircrafts and Airbus will produce 43%, and Russian government backed companies and the Ukrainian will produce the remaining 1%. In 2007, Airbus forecast record orders. According to a spokesperson, orders for Airbus, will surpass 1,111 (2005) and deliveries will exceed 450 making it the No.1 aircraft manufacturer in the industry for the fifth year. However, a spokesperson from Airbus denied the speculations of further delay of the A350 XWB and the announcement of the launch date of A350 was announced in 2007. However, there are concerns regarding the launch date of A350 as the company will lag behind by six years of Boeing 787 Dreamliner’s launch. Due to the redesigning of the A350 XWB model, the launch of the aircraft was scheduled to be in 2013, which falls behind the scheduled introduction of the Boeing 787. Company sources of Airbus also felt that the delay might make them lose some orders but will make up the delay with the ample time it gets, to improvise on its design. For the next 20 years till 2025, Airbus aims to increase its

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38 Ibid.
39 Ibid.
40 “US and EU trade charges at WTO over aircraft subsidies”, op.cit.
41 Ibid.
43 Ibid.
44 “Mideast puts Airbus Ahead of Boeing”, op.cit.
market share than Boeing. Analysts opine that Airbus might face hurdles for introducing its aircraft. But felt that the success will depend on the design aspects and services of both 787 and A350.

On the other side, few analysts predict that soon after its launch, Boeing would have sold more than a thousand 787’s. The issue was further precipitated when a senior aviation analyst from Forbes announced that A350 XWB would be delayed till 2014. The problem with Airbus is that it plans to build most of A350 with aluminium alloy whereas Boeing is planning to build 50% of Boeing 787 with hardened plastics which will make it lot lighter and more fuel efficient.

Though Airbus and Boeing battle for supremacy in commercial aircraft production, the duopoly is hampered with growing international competition from emerging markets like Brazil, Russia and China. Analysts also observe that Bombardier Aerospace, a division of the Bombardier Group and third largest aircraft company is competing to grab a market share from Airbus and Boeing. The company plans to launch the C-Series aircrafts in the large-sized commercial aircrafts – segment in which both Boeing and Airbus operates. The Canadian and UK governments have invested $700 million in Bombardier, for the C-Series aircrafts which is set to provide competition to the big two. The Russian aerospace industry run by the government is also planning to combine all its aircraft companies like Irkut, Mikoyan, Sukhoi, Ilyushin, Tupolev and Yakovlev into a single company called Unified Aircraft Building Corporation (UABC), to compete with Airbus and Boeing in a big way. China seems to be by far emerging as the biggest competitor to both Airbus and Boeing, although Airbus and Boeing have outsourced their work to China. And after years of being a supplier, China has gained adequate experience and competence to challenge the duopoly players. China has its own ARJ-21 aircraft which is 60-105 seater and is also planning to manufacture a wide body aircraft along with Russia. Japan is also poised to become a future competitor in the aircraft industry. Mitsubishi Heavy Industries of Japan is all set for the launch of its first ever passenger jet expected to be manufactured in Japan.

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45 “Airbus Bides Its Time in Boeing Battle”, op.cit.
46 “King of the Sky: Boeing Dreamliner vs. Airbus A350 XWB”, op.cit.
47 Bombardier Aerospace is a division of the Bombardier group. It is the third largest aircraft company in terms of workforce (behind Boeing and Airbus) and the fourth largest in yearly delivery of commercial airplanes (behind Boeing, Airbus and Embraer). Bombardier builds business jets, short-range airliners and fire-fighting amphibious aircraft and also provides defence-related services.
49 Irkut refers to the Irkutsk Aviation Industrial Association, which was setup in 1932 in the Transbaykal region in the Russian Federation. It is best known as being the manufacturer of the Sukhoi-30 family of interceptor/ground-attack aircraft.
50 Mikoyan, formerly Mikoyan-Gurevich Design Bureau, is a Russian military aircraft design bureau, primarily manufacturing fighter aircraft.
51 Ilyushin or Ilyushin Design Bureau is a Russian design bureau and aircraft manufacturer, founded by Sergey Vladimirovich Ilyushin. Ilyushin has developed aircraft for widely varying roles over the years.
52 Tupolev is a Russian aerospace and defense company, headquartered in Moscow. Officially known as Public Stock Company Tupolev, it is the successor of the famed Tupolev OKB or Tupolev Design Bureau headed by the renowned Soviet aerospace engine A.N. Tupolev.
53 A.S. Yakovlev Design Bureau JSC is a Russian aircraft designer and manufacturer. It was formed in 1934 by designer Alexander Sergeevich Yakovlev. During World War II Yakovlev designed and produced a famed line of fighter aircraft.
54 The ACAC ARJ21 Xiangfeng (Flying Phoenix) is a twin-engined regional airliner, and is the first passenger jet to be developed and indigenously produced by the People’s Republic of China.
55 As the leading company of the Japan’s aerospace industry, Mitsubishi Heavy Industries (MHI) has been engaged in the development and production of a wide variety of aerospace products and thus contributed to the advancement of Japan, a technology-oriented nation, through its cutting-edge technologies.
Annexure I
The US Challenge to the EU's support for the Airbus

- The US now seeks to argue that the benefit of Member-State Financing (MSF) alone amounts to as much as $205 billion. This estimate is completely unrealistic. It is more than 8 times the capitalisation of EADS, $25.8 billion, or roughly 12 times the net assets of EADS, $18.4 billion! The calculation method used is contrary to accepted wisdom, practices and WTO subsidy rules. If the US methodology were to be applied to the massive federal, state and local subsidies benefiting Boeing, the amount challenged by the EU would be not $23 billion, but rather $305 billion.
- The US argues that without MSF, Airbus could not have launched its aircraft programmes. The US conveniently overlooks that a number of Airbus models were launched without any MSF, just as launch has also taken place in situations where Airbus in fact obtained financing on better terms and conditions in the commercial market. This is fatal to the US argument that MSF caused adverse effects to Boeing - in fact the EU has shown that all Airbus aircraft launched in the last 15 years could have been launched without MSF.
- Boeing’s stellar financial performance makes any US claim of "injury" highly implausible: the EU shows this by pointing at Boeing’s record numbers of order backlogs and profits.


Annexure II
The EU’s Challenge of US subsidies to Boeing

The US filed its reply to the EU’s challenge on July 6th 2007. The following points will be the focus of the hearing before the WTO panel scheduled for 26-27 September 2007:

- The US readily acknowledges that FSC and successor schemes were prohibited export subsidies and that Boeing was a main beneficiary thereof.
- For certain subsidies granted by the State of Washington and the State of Illinois the US puts up a less than vigorous defence and appears to agree with the EU that subsidies have benefited - and will benefit - Boeing.
- For other subsidies such as those granted by Kansas authorities the US makes sweeping statements that Boeing has not benefited - and will not benefit. The US offers no or very limited evidentiary support for these claims.
- Finally, as regards the massive overpayments in terms of R&D contracts for the Department of Defence and NASA, the US predictably seeks to argue that this constitutes payment for services not covered by the WTO disciplines on subsidies that the US government is not overpaying and follows procurement procedures, and that Boeing receives adequate consideration in return. First, the US does not provide evidentiary support for such claims but simply refers to Department of Defence and NASA Regulations. This ignores, however, that for NASA R&D programs in particular, these are sham transactions whose objective is solely to support the US aeronautics sector/Boeing in very specific areas of research, with the resulting R&D being applied to Boeing’s aircraft models. The US is also challenging the amount of R&D subsidies granted to Boeing - an apparent contradiction with its stance on its own challenge of Airbus support where the US grossly inflates the numbers.