

## Centre for International Economics

### Case Study Boeing Airbus Industrie 2020

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**The case explores the complex issues, technological and market-related issues between Airbus and Boeing in Super Jumbo Jet development contest.**

#### **Overview of the argument**

This exercise requires you to evaluate the decision of AirBus Industrie, the European civil aircraft business to develop and market a replacement of the Boeing 747 Jumbo Jet. This aircraft known as the A380 has been in service for over a decade and a half. It is the largest civil passenger aircraft ever constructed.

The argument set out below is based on the main facts and figures available remembering that these are continuously being updated. There is now a great deal of information about how the companies have positioned themselves in response to these changes. **You should check out the various stories which deal with the A380 - the Super Jumbo Jet, the stretched Boeing 747 (747-800) the Airbus A350 and the Boeing Dreamliner - on the internet.** They are all interconnected in this complex saga.

The exercise has been put together in such a way that it requires an appraisal of a wide range of different though interconnected issues - market potential, commercial viability, technological uncertainties, risk, government intervention, environmental issues, financing, unfair competition and lastly - winning hearts and minds!

#### **The players**

AirBus Industrie is a successful European multinational public company<sup>1</sup>, a manufacturer of aeronautical products with its headquarters in Toulouse in South Western France with supporting manufacturing “partners” in various parts of the European Union (EU). Companies in several countries of the EU are

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<sup>1</sup>Airbus SE (Societas Europaeae) is a European multinational corporation that designs, manufactures, and sells civil and military aeronautical products

shareholders, including several EU governments. The company is today a listed public corporation trading on the Paris Stock Market (CAC) and Euronext. Boeing is a US incorporated company listed on the New York Stock Exchange. It is a well established and highly successful aircraft manufacturer with a strong brand image. It develops and builds wide range of civil and military aircraft. It is a major contractor to the US Department of Defence. It currently faces serious on-going challenges follow two catastrophic failures of its upgraded short to medium haul aircraft the 737 MAX. This, its largest selling aircraft, remains grounded.

### **The product positioning of the two companies.**

In the face of severe competition from Boeing, until recently the world's largest civil aircraft constructor, AirBus has competed successfully in the short and medium range with the A300 series. In recent years they have developed a stretched version of the A300-400. This provides them with a twin engine FAA approved long haul airliner - a close competitor to the four-engined Boeing 747. The stretched A300-400 has long since established parity with Boeing for the sale of these larger wide-bodied aircraft.

The Boeing 747 series has been produced for over 50 years. Over 2,000 aircraft have been delivered against original market projections at around 100 units. Its safety record is one of the finest for any one single aircraft design. The stretched versions of the 747 (the 747-4 and 747-6) can fly distances of up 9,000 nautical miles without refuelling. The aircraft has a sub-sonic cruising speed of around 580 mph and a payload on the existing stretched version of 450 passengers and crew.

### **A successor to the Jumbo**

Boeing has over a long period of time been exploring the possibility of a new large capacity successor to the 747 series. Extensive research has been undertaken with a view to developing and manufacturing a supersonic version of the 747 with a capacity of up to 1,000 passengers alongside other more radical options. The supersonic option has been indefinitely shelved because of serious environmental disadvantages<sup>2</sup> Boeing at one stage in the argument spent much time and effort deflecting interest from a radically extended 747. This was finally reversed in the light of competitive developments when Airbus launched the A380.

Aircraft operators have in recent years focused on a fuel efficient lower capacity aircraft designs. The first of these new designs – the Boeing Sonic Cruiser –

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<sup>2</sup> The Anglo French experience with Concorde, the supersonic aircraft, highlighted the problems of flying the aircraft at supersonic speeds over land mass caused by the *sonic boom*.

was eventually abandoned. Boeing offered instead the 787<sup>3</sup> - called the Dreamliner. This medium to large capacity aircraft is now operating after technical problems in production and deliveries. These issues have been resolved and the aircraft is in operation supported by a strong and growing order book

Most recently Boeing has again returned to the idea of a fully stretched 747 version. The 747 - 800 is now well established. It too has suffered delays in manufacture and problems during flight tests but these too have been resolved. Both aircraft are succeeding well in world markets.

### **Airbus Industrie's giant step**

AirBus Industrie's thoughts have developed along different lines. It announced plans in 2003 to develop and build a sub-sonic Super Jumbo jet named the A380. The first development model was unveiled in March 2005 amid much fanfare in several EU capitals. It has been greeted with hostility from Boeing, the US Congress and the US Department of Commerce.

Given the fearsome competition within the aircraft industry and substantial levels of excess capacity with existing sub-sonic aircraft the suggestion was originally greeted by Boeing with derision. Airbus Industrie, undeterred, proceeded to manufacture the A380 but downgraded its sales forecasts to below 500 units. At an early stage in the saga it secured Large key orders from several major carriers notably Emirates. But there have been uncertainties about the future of the A380. In January 2018 it was stated that orders for the aircraft had reached around 350 with around 220 of aircraft now in service with major world carriers.

### **The end of the A380**

But there have been rising concerns about the ultimate potential of the A380. In mid year 2019 Airbus announced that it will cease production of the aircraft in 2021. This reflects a shift in market demand away from 4 engined to smaller and more fuel efficient twin-engined aircraft. Airbus has put a major sales effort behind its twin-engined A350 which is a direct competitor with the Dreamliner. This aircraft has been well received by airline operators and is supported by a strong order book.

The decision to pull out of the A380 market will be a severe blow to major manufacturing businesses in the Airbus supply chain. Most notably Rolls Royce – headquartered in the north west of England - will be impacted by the ending of orders for the Trent 900 engines four of which power the A380. The company

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<sup>3</sup> Some liken the Dreamliner to a stretched version of the 777 aircraft.

will enjoy some offset from increased sales of the Rolls Royce Trent 1000 engines two of which power the A350.

### **Disputes between the companies**

Boeing has accused Airbus of receiving illegal subsidies from member government. Airbus has counterclaimed arguing that Boeing is also the recipient of illegal government funding leaving the two companies on a collision course! Discussions between the EU and the US government have so far failed to resolve the crisis. Boeing has lodged its deposition of unfair competition against Airbus with the WTO in Geneva. Airbus has responded in like terms.

The EU and the US have both been found at fault by the WTO dispute settlement system for continuing to provide certain unlawful subsidies to their aircraft manufacturers. The broader view of the WTO is, however, that imposition of countermeasures would only inflict damage on businesses and citizens on both sides of the Atlantic, and harm global trade and the aviation industry in particular at a sensitive time.

The European Commission has consistently stated that the European Union is ready to work with the US authorities to reach a fair and balanced solution for their respective aircraft industries. The aircraft sector is amongst the most complex industries in the world, from the development, production and financing point of view. The sector calls for comprehensive subsidy disciplines so that all players compete on an equal footing.

The EU has recently shared concrete proposals with the US for a new regime on aircraft subsidies, and a way forward on existing compliance obligations on both sides. So far the US has not acted but the Administration has made clear that it will take retaliatory measures against Airbus a situation which will invite counter measures by the EU.

### **The commercial arguments from both sides**

The facts as revealed by both parties are as you might expect - considerably at variance with one another. AirBus Industrie claims that the market for a sub-sonic large volume carrier is high enough to recover the development costs and make an adequate return for their shareholders. AirBus has indicated that that the development and marketing costs would be recovered at an indicative price in the region of \$280m per aircraft unit. **Make sure you get a clear picture on these market estimates.**

Boeing's reaction to AirBus Industrie's assessment of the potential market for the new aircraft is that it is very substantially overstated. The R&D development budget for the A380 is in excess of \$12bn. This would be needed to establish the manufacturing technologies for the airframes and the

development of a completely new generation of power plants. It would have to be recovered in sales of the A380 and would represent a very large fixed cost per aircraft along with the manufacturing and fitting out costs of the aircraft.

As a rough rule of thumb the ratio of fixed costs (R&D and other development costs) to manufacturing costs are judged to be of the order of 3:1 at breakeven<sup>4</sup> (excluding the cost of the four Trent 900 engines bought in from Rolls Royce Plc. Without a very substantial order book the recovery of these huge forward outlays would push aircraft unit prices to levels well above the purchasing capacity of all but a few major global carriers and substantially above the levels projected by AirBus Industrie.

After exhaustive research Boeing have concluded that apart from the problems of manufacturing and power plant technology, the scale of airport infrastructure investment would seriously slow market demand for the new aircraft to unviable levels. They have argued that new runways and new passenger handling facilities would entail huge new airport investments in the major cities globally and drive up aircraft operating costs through much higher landing charges. This would in turn offset any improvements in terms of aircraft operating costs. But there was another side to the story.

### **Some additional insights**

Some facts not immediately clear in the case are that Boeing and AirBus Industrie are locked in a “fight to the death”. Boeing has watched its competitive domination of the 'mass' transport industry being gradually eroded by AirBus Industrie - often on the back of alleged hidden government subsidies. Boeing has challenged AirBus Industrie of unfair trading practices in the past.

Despite the fact that Boeing remains in a very strong market position they are clearly increasingly concerned about the European challenge. AirBus Industrie is now seen as a powerful rival across the full range of commercial aircraft models. AirBus in the early 2000's had overtaken Boeing in terms of all civil aircraft deliveries though most recently Boeing have experienced a strong revival in fortunes with AirBus struggling to deal with production delays, cost overruns and serious challenges in restructuring its business in the light of changing market conditions for the A380. This again has recently changed reflecting the shifting fortunes of both manufacturers. **All of these angles need to be fully explored as part of your research.**

### **Sweating existing R & D**

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<sup>4</sup> For clarity – at breakeven the ratio of manufacturing costs are roughly 3 times that of fixed costs.

It needs also to be borne in mind that Boeing could upgrade the stretched versions of the 747 as they have already indicated. This could provide subsonic full-length double deck accommodation. This would raise the passenger payload to around 500 economy and 150 in Business and First Class - something similar, though not the same as the AirBus A380 specification. A new stretched double-deck version of the 747 has been developed. New composite materials – pioneered by Airbus - are being used in manufacturing in order to reduce weight and improve strength and lower operating costs.

The major power plant manufacturers, General Electric in the US and Rolls Royce in Britain have the capability of producing engines with capacity greater than the output of the existing 747 power plants and sufficient for the much larger A380. These can also meet the highest and most exacting standards in respect of fuel economy, atmospheric emissions and noise pollution. Rolls Royce has developed the Super Trent high thrust engine which will be used to power the A380. **Facts and figures can be obtained from the Rolls Royce website.**

AirBus Industrie know they have to steal a march on Boeing or probably face a significant scaling down in their operation. Having developed a highly successful series of short and medium haul aircraft - the stretched version allows them to compete with conventional Boeing 747's. Their dilemma is that if Boeing were to unveil a double-decker Jumbo competitor this could very well threaten their prospects of opening up the most lucrative end of the market. This is a key factor in the decision of Airbus to develop and manufacture the A380. Boeing, as already stated, questions whether there is a viable market for the A380. **You will need to take a view on these claims and counterclaims.**

### **How will the competitive challenge be resolved?**

This is a typical duopoly problem whose resolution at this stage may very well draw more on skills at poker than chess! On the facts as revealed a key question must centre on whether AirBus Industrie has overstated market demand for the A380. Shortfalls in terms of market demand will leave AirBus Industrie critically exposed. There is also the issue of airport upgrade costs which would have to be borne by Airport Operators but ultimately recovered from Airline Operators.

AirBus Industrie will also find itself hard pressed with lower levels of market off- take to recoup the huge R & D and tooling costs. This might invite some form of government write-off of debt – a claim never far from the mind of their competitor. It is doubtful, however, whether the EU would risk legal action in the courts against unfair trading - were the Americans to seriously contest government assistance in the funding of such a project. In much the same way it

appears unlikely that the US government will want Boeing to press their claim at the WTO. Legal action has been taken in the WTO court in a bid to resolve the matter. The result has been inconclusive.

As a final point the major carriers, British Airways, American Airlines, JAL, Emirates, Singapore Airlines and Qantas, and possibly some European carriers, would be the only airlines capable of making initial aircraft purchases where the capital and fitting out costs could well be in the region of \$300+m per unit. This could well leave order books very thin in the first few years with the carriers looking hard for real sweeteners. This would put massive strains on the cash flow of whoever drinks from this particular poisoned chalice. Sounds like a deal where the two competitors might wisely pool their skills and their resources. But would or could that ever work?

### **Evaluation**

Taking the facts as presented at face value you are asked to try to validate the following propositions:

1. Which constructor would in your view be likely to have the strongest grasp of the technological and commercial aspects of the development opportunity and why?
2. Why does Boeing regard so negatively AirBus Industrie's initiative? Why does AirBus view the challenge as one where it has no choice?
3. What sort of unit price in current dollars would be implied using estimates provided by Airbus in respect of development and manufacturing costs for the new aircraft - and their estimate of market demand?
4. If you were an investor would you feel that AirBus investment case should be explored further? How would you rate the risks of the proposition succeeding commercially?
5. How far in your view would the uncertainties in respect of airport infrastructure development costs and other environmental considerations be inhibiting factors?
6. Given the huge investment that individual carriers would have to make and the very much higher operating costs of the new aircraft in landing charges alone how would you expect the major carriers to respond?
7. This project is one whose success depends critically on the 'battle for the minds' – referring to the importance on winning support from a worldwide

constituency consisting of airline operators, passengers and many other action/ lobby groups with different axes to grind! Take into account the advertising campaigns of both Airbus and Boeing in your assessment.