2025 MICCSR CASE

14th Annual

Milgard Invitational Case Competition on Social Responsibility

Airbus, Boeing and Embraer (Wings of Change)

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MILGARD SCHOOL OF BUSINESS | CENTER FOR LEADERSHIP & SOCIAL RESPONSIBILITY

Airbus, Boeing and Embraer (Wings of Change)



Leaders in the Civilian Aerospace Industry

Airbus, Boeing and Embraer the three main players in the civilian aerospace industry are the focus of this case. Between them they produce over 90 percent of the aircraft in service with airlines globally. Their successes and challenges impact not just the airline industry but also trade and tourism globally.

AIRBUS

Airbus SE is a European aerospace corporation whose main business is the design and production of commercial aircraft. It was launched in 1970 as a joint venture of European aerospace companies aimed at producing commercial aircraft to compete with American aircraft manufacturers. The company was incorporated as the European Aeronautic Defence and Space Company (EADS) in 2000 through the merger of the French Aerospatiale-Matra, the German DASA, and the Spanish CASA. EADS rebranded itself as Airbus SE in 2015. Consistent with its multinational roots, it operates major offices and assembly plants in France, Germany, Spain and the United Kingdom. Recently it has also added operations in Canada, China, and the United States. Its shares are listed on stock exchanges in Frankfurt, Paris, and Madrid. It reported revenues of €65.4 billion and a profit of €3.7 billion in 2023.

BOEING

Boeing is an American aerospace company that designs, manufactures and sells commercial aircraft. It also has a significant defense business and was the fourth largest defense contractor globally in 2022. Boeing was founded by William Boeing in Seattle, Washington in 1916. In 1960, Boeing bought Vertol Aircraft Corporation which was the biggest independent manufacturer of helicopters at the time. During the 1960s and 1970s, Boeing diversified into industries such as outer space travel, marine craft, energy production, and transit systems. In 1997, Boeing merged with McDonnell Douglas, a large aerospace company in its own right. Boeing's shares are listed on the New York Stock Exchange (NYSE). It reported revenues of US$ 77.7 billion and a loss of US$ 2.2 billion in 2023.

Top Stories

"Airbus Fails To Capitalize on Boeing's Chaos"

Wall Street Journal, August 14, 2024

Airbus, Boeing and Embraer (Wings of Change)



EMBRAER

Embraer S.A. is a Brazilian multinational aerospace company. It develops and manufactures commercial aircraft and aviation systems, and provides leasing equipment and technical support services. Embraer is the third largest producer of civil aircraft after Airbus and Boeing. It also has a significant presence in military aviation and ranks among the top defense contractors globally. Embraer was founded in 1969 by the government of Brazil as a national champion for domestic aerospace technology. It initially focused on producing military aircraft for the Brazilian air force. However, by the 1980s it started producing quality commuter and regional aircraft for export. Embraer was privatized in 1994 and expanded into the manufacture of larger regional airliners and smaller business jets. In 2000, it became a public corporation with its shares listed in Brazil and the United States. It reported revenues of US$ 5.3 billion and a profit of US$ 164 million in 2023.

Environmental impact of Aviation

Few issues annoy environmentalists as much as the negative environmental impact of aviation. Aircraft engines emit gases, noise, and particulates from burning fossil fuel, raising environmental concerns over their effects on air quality. By 2020, aviation emissions were 70 percent higher than in 2005, and barring significant efforts at mitigation, they could grow by 300 percent by 2050. Critics complain that air travel has so far been exempt from carbon pricing which covers a quarter of all emissions. After a Covid-induced dip, air travel is growing once again and has returned to, or even exceeds, pre-pandemic levels in many parts of the world.

Despite continuing efficiency improvements from the major aircraft manufacturers, the rapid growth in demand for air travel in recent decades has resulted in increasing greenhouse gas (GHG) emissions. Commercial aviation accounts for almost 3 percent of total carbon dioxide (CO_2) emissions. Aviation is the main human source of ozone, a respiratory health hazard that causes thousands of premature deaths per year. Air traffic also causes noise pollution during takeoff and landing which adversely affects the health of those living near airports.

Breaking News!

"Boeing Plea Tied to Crashes is Turned Aside"

Wall Street Journal, December 6, 2024

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Water pollution is another concern. Airports can cause significant water pollution due to their widespread use and handling of jet fuel, lubricants and other chemicals.

Deicing fluids can pollute water since surface runoff carries them to nearby streams, rivers or coastal waters. This harms aquatic life due to declining levels of dissolved oxygen in these bodies of water.

CO_2 emissions from the jet fuel burned per passenger on an average 3,200 kilometers (2,000 mi) flight is about 353 kilograms (776 pounds). Loss of natural habitat associated with the jet fuel burned per passenger on such a flight is estimated to be 250 square meters (2700 square feet). Critics also fault the airline industry for negative environmental impact from waste generated on commercial flights.

A 2022 global survey on air travel by McKinsey & Company found that most passengers recognize that aviation has a significant negative impact on the environment. Emissions were the top concern of respondents in 11 of 13 countries polled, up from four countries in a 2019 survey. More than half the respondents indicated that they are “really worried” about climate change, and that aviation should become carbon neutral in the future.

Mitigation Measures

Improved Technology: Currently, fleet renewal provides the largest impact on reducing emissions through engine design and developments in aerodynamics. Engineering improvement packages for airframes and engines help reduce drag and improve engine efficiency. Each new generation of aircraft is roughly 15-20 percent more fuel efficient. For example, the Embraer 195 airplane emits 31 percent less CO_2 per seat and is 63 percent quieter than its predecessor, the Embraer 190. Aircraft manufacturers currently invest around $15 billion per year into attaining greater fuel efficiency.

Non fossil fuel powered aircraft: Through a variety of research and experimentation, progress is being made towards technologies for making green fuels for aircraft. Sustainable aviation fuel (SAF) is showing signs of promise as a potential alternative to the kerosene currently used by planes.

In the news!

“Airbus’s Airplane of the Future Struggles to Overcome Troubles”

Wall Steet Journal, September 11 2024

Airbus, Boeing and Embraer (Wings of Change)



Airlines have already undertaken some 450,000 flights using SAF as part of the fuel mix. It can potentially reduce carbon emissions by 80 percent compared with fossil fuels without having to change the fuel supply systems or engines of aircraft. Much of the SAF developed thus far is derived from discarded cooking oil and animal fats and relies on photosynthesis to do the carbon fixing. IATA suggests that SAF could account for two-thirds of air travel's carbon mitigation. However, that would require 450 billion liters of SAF annually by mid-century – a tall order without government carrots and sticks. Other non-fossil fuel alternatives are electric and hydrogen powered aircraft. In 2020, Airbus unveiled liquid-hydrogen powered aircraft concepts as zero emissions options with a target date of 2035. Aircraft that don't lend themselves to being electric powered could use primarily hydrogen based fuel.

Improvements in aircraft operations and infrastructure: Making aircraft fleets lighter, reducing the weight on planes, eliminating single-use plastics and recycling solid waste can all help reduce fossil fuel consumption in air travel. The use of new air traffic control techniques are additional tools to reduce emissions. For example, landing using a continuous descent into an airport reduces carbon emissions by over 150 kg (330 lbs.) per flight. Adding wingtip devices to an aircraft can reduce fuel use by 4 percent. Shortening flight times saves 100 kg of CO_2 per minute. Stakeholders in air traffic management are working to improve airspace efficiency incrementally. Electric taxiing of aircraft to and from the gate can also contribute to reducing emissions.

Reducing demand for air travel: The significant challenges of sustainable aviation fuel expansion, including food security, local community impacts and land use issues point to the importance of simultaneous demand reduction efforts. For example, if current travel trends continue, tourism is projected to generate up to 40 percent of total global CO_2 emissions by 2050. The Western Norway Research institute (106) estimated that 1 percent of the world population emits half of commercial aviation's CO_2 while almost 90 percent never fly in a given year. Some of the steps that can be taken to reduce demand for air travel include a move from air travel to high-speed rail, curtailing short haul flights in favor of more environmentally forms of transportation including trains.

Exclusive!

"Boeing Needs to Tackle its Balance Sheet"

Wall Street Journal, October, 2024

Airbus, Boeing and Embraer (Wings of Change)



In Sweden the concept of “flight shame” or “Flygskam” calls for a shift from air to rail travel. As this concept gained visibility, in part due to activists such as Greta Thunberg, nearly twice as many Swedes chose to travel by train rather than air in 2019 compared to 2018. Consumer behavior can also be influenced by making air travel less attractive through air passenger taxes, departure taxes and jet fuel taxes.

Current Headwinds at Airbus, Boeing, and Embraer

AIRBUS

Airbus displaced Boeing as the largest aerospace company by revenue in 2019. Since then it has continued to outperform Boeing in the number of orders booked for commercial aircraft as well as the number of planes delivered. However, lately Airbus has faced its own problems. On June 25, 2024, it lowered its commercial aircraft delivery goals as well as its financial targets due to supply chain challenges. This caused its stock to drop by 9.4%, a decline of $12 billion in its market capitalization. It lowered its goal of aircraft delivery to customers from 800 planes to 770 planes. Demand remains high with airlines looking to expand capacity to meet the post-covid surge in travel. However, the supply side is mired in problems. This has resulted in Airbus being unable to deliver aircraft to customers as promised.

Similar to Boeing, Airbus has also encountered problems with existing planes in airlines’ fleets. In August 2024, a plane made by Airbus’s joint venture with Italy’s Leonardo fell from the sky in Brazil killing all 62 passengers and crew on board. In September 2024, Cathay Pacific Airways had to cancel a number of flights due to engine problems with Airbus A350 jets. This resulted in the European Union’s aviation safety agency calling for inspection of Airbus A350 model planes. Another of its planes the Airbus A220 has had recurring problems with durability of its jet engines. Scarcity of parts and long repair times mean that there is no quick fix. While orders for the A220 were booming in 2022 and 2023, cancellations exceeded new orders in 2024. Its difficulties are not limited to its commercial aviation division. In October 2024, Airbus announced that it would lay off 2,500 workers from its struggling defense and space divisions.

Hot Off the Press

“Airbus Misses its Delivery Target Amid Supply-Chain Challenges”

Wall Street Journal, January 10 2025

Airbus, Boeing and Embraer (Wings of Change)



The delay in the delivery of new aircraft as well as the grounding of aircraft due to technical problems will result in Airbus having to make significant penalty payments to compensate its customers. All of these challenges mean that Airbus has not been able to capitalize on the chaos at its main competitor, Boeing.

BOEING

The 737 MAX should be a steady source of revenues for Boeing. However, this has not been the case since two fatal crashes led to its temporary grounding in 2019. Just as things were returning to some normalcy with the 737 MAX, production of Boeing's most important jet is once again facing difficulties and has been curtailed following a mid-flight blowout of a fuselage panel on an Alaska Air flight in January 2024. Production of the wide-bodied 787 Dreamliner has slowed down due to supply-chain problems related to a shortage of heat exchangers and cabin seating. Plans to launch the bigger 777X are years behind schedule. Its usually lucrative defense division which makes F-15 jet fighters and Chinook helicopters for the military has also become unprofitable. Also embarrassing was the software failure that has left two astronauts piloting its Starline spacecraft stranded aboard the International Space Station for many months instead of the eight days originally scheduled for the trip. As if all these issues were not challenging enough, 33000 Boeing machinists went on strike in September 2024. A lengthy work stoppage hit suppliers which had just begun to recover from shutdowns caused by the pandemic and the 20-month grounding of Boeing's 737 MAX following fatal crashes in 2018 and 2019. While Boeing finally reached an agreement with the unions the protracted strike caused additional delays in its manufacturing schedule and also increased its labor costs significantly.

Continued struggles at Boeing could yet open the door for challengers. COMAC, a Chinese company, has signaled its plans to break the duopoly of Boeing and Airbus though so far without a plane that can truly compete with them. Embraer, the Brazilian maker of smaller regional jets could also make a move into bigger passenger aircraft. Boeing also faces calls from its airline customers for compensation for losses resulting from its failure to deliver aircraft as contracted. In April 2024, it paid Alaska Air $160 million as compensation for lost profits with Alaska Air indicating that it expects further compensation.

News Flash!

"Boeing Loses $4 billion as Woes Mount"

Wall Street Journal, January 24, 2025

Airbus, Boeing and Embraer (Wings of Change)



EMBRAER

While Embraer is less impacted than Airbus and Boeing it has had its own challenges. It has experienced supply chain issues with Pratt & Whitney engines. This has resulted in several Embraer aircraft with Pratt & Whitney engines being removed from service at many airlines. In June 2023, KLM was forced to ground part of its Embraer E195-E2 fleet due to engine problems. This development caused disruptions in KLM's flight schedules. While KLM was the first airline to encounter the problem, 89 other airlines that operate Embraer aircraft with the Pratt & Whitney engines are also affected. These include IndiGo Airlines with 138 affected aircraft, Delta Air Lines with 131, and Spirit Airlines with 104 aircraft. Other airlines such as JetBlue, Turkish Airlines, Wizz Air Malta and Volaris are also significantly affected. To deal with the impact of the engine problems, airlines have taken various measures including parking aircraft to deploy their engines as spare parts. This illustrates the magnitude of the problem related to the shortage of available spare engines.

Separately, an Embraer E175 aircraft on a United Express flight from Austin to Houston on October 9th 2024 lost power and experienced steering issues mid-flight. The US Federal Aviation Administration has launched an investigation into the flight.

Assignment

Despite, or perhaps because of, the flurry of bad news Flyright Global Select Fund is looking to invest significant funds in an aircraft manufacturer. You are the Chief Investment Officer at Flyright. Based on your assessment of Airbus, Boeing and Embraer from a financial performance perspective as well as each company's actions to mitigate the environmental impact of aviation which company would you invest in. Explain.

Happening Now!

"Jet Maker Embraer Scores Breakout on Record $7billion Order from Flexjet"

Investors Business Daily, February 5, 2025