YFAC

BOEING

BOEING: THE FLIGHT BACK TO GOLDEN TIME

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EXECUTIVE SUMMARY

RECOMMENDATION

As Mr. John Doe's advisor, we would recommend him to invest in the Boeing company (BA: NYSE) and a $296 per share target price. Our recommendation is based on Boeing's: (1) significant growth catalysts with the return of 737 MAX; (2) sustained competitive advantages and a strong Aerospace and Defense (A&D) industry backdrop; and (3) relative undervaluation compared with its competitor, Airbus. We believe Boeing's potential is yet to be fully appreciated by the market due to the overhang of COVID-19 and the 737 MAX incident, which should dissipate in the near future.

INVESTMENT RATIONALES

1, *Massive backlog of orders and large switching costs prevent customers from shifting to alternatives.* Boeing's firm backorders of $363.5B as of June 30th, 2021 provide great visibility into future revenues. The great monetary value of contracts and long waiting time for each product are the primary hindrances preventing customers from canceling orders and switching to other companies.

2, *Improved situation of COVID-19 pandemic combined with a pent-up desire for traveling offers significant growth potential*. Rapid vaccination rollouts and the consequent improving situation of COVID-19 pandemic combined with strong demand for travel promises Boeing's highly positive outlook. Both domestic and business travel should witness a strong recovery and return to pre-pandemic levels by 2023. The aviation industry in general and Boeing, in particular, will derive much benefit from this trend.

3, *The return of 737 MAX should be a significant growth driver for BA in future years, bringing the company back to its golden time*. With 175 countries approving 737 MAX's return, this best-selling airplane can help Boeing's sales recover in 2021 and even return to its previously high level. Massive deliveries of 4085 back ordered 737s and their strong suitability for domestic travel, which are coming back faster than long haul travels are the reasons we believe the recertification of 737 MAX will be one of the biggest growth catalysts for Boeing.

AEROSPACE AND DEFENSE INDUSTRY

The A&D industry is characterized by high intensity of rivalry, high buyers' bargaining power, low threats of substitutes, low threats of new entrants, and moderate suppliers' power. These characteristics are mostly due to the high concentration, high capital cost, and high switching cost natures of the industry. In this overall neutral environment market, Boeing has many competitive advantages, including large-scale production, leading technological advancement, and support from the US government, to grow further in the global market. Furthermore, the Boeing-Airbus duopoly (91% market share) in the Aerospace industry also indicates Boeing's solid position in the industry.

EVALUATION

Our target price of $296 per share offers a potential return of 25% over the next year. We arrive at our target price using the comparable company analysis with Airbus and Discounted cash flow analysis.

Ticker	**BA: NYSE**
Share price (Aug 31)	**$217**
Rating	**Buy**
Target price	**$296**
Market Cap *($M)*	**171,602**
Net Debt *($M)*	**55,222**
EV *($M)*	**226,824**

($M)	**2020**	**2021***	**2022***
EBITDA	(10,074)	(2,138)	8,378
FCF	(5,700)	(27,752)	6,107

Market Size (2020 Data)

Global market value	$736.36B
US market value	$416.63B

Projected Industry Growth

- 5.2% CAGR to $774.54B in 2021
- 6% CAGR to $973.2B in 2025

Potential Market Catalysts

- Pent-up demand for traveling
- The easing of Covid-19 restrictions
- Defense budget increase in major countries
- The growing interest in space exploration

Risks

- Risks to the top line:
  - Unexpected changes in both the international and domestic markets.
  - Potentials of mergers & joint ventures
  - Discontinued contracts
- Risks to profitability: Changes in estimated cost (manufacturing & operation)

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COMPANY OVERVIEW: BOEING

I. COMPANY PROFILE

The Boeing Company (BA: NYSE) is the leading aerospace company in the world and foremost manufacturer of commercial aircraft, strategic defense, space and security systems, and service provider of aftermarket support. Founded in 1916 by William E. Boeing, it is headquartered in Illinois, the USA. Boeing now employs 140,000 people in the U.S and has operations in 65 other countries.[1] Boeing proclaimed its mission statement, "*To connect, protect, explore, and inspire the world through aerospace innovation*." [2]

II. COMPANY SEGMENTATION

Boeing offers products and services including commercial and military aircraft, satellites, weapons, electronic and defense systems, launch systems, advanced information and communication systems, and performance-based logistics and training. Boeing operates its business through 4 reportable segments (discussed in more detail later).

- Commercial Airplanes (BCA)
- Defense, Space and Security (BDS)
- Boeing Global Services (BGS)
- Boeing Capital Corporation (BCC)

EXHIBIT 1: Revenues from 2017 to 2020 ($ in millions)

	2017	2018	2019	2020
Commercial Airplanes	$58,014	$60,715	$32,255	$16,162
Defense, Space and Security	20,561	23,195	26,095	26,257
Global Services	14,581	17,018	18,468	15,543
Boeing Capital	307	274	244	261
Unallocated items, eliminations, and other	542	-75	-503	-65
Total	**$94,005**	**$101,127**	**$76,559**	**$58,158**

(Source of information: Boeing.com)

EXHIBIT 2: Loss/Earnings From Operations				
	2017	**2018**	**2019**	**2020**
Commercial Airplanes	$5,285	$7,830	($6,657)	($13,847)
Defense, Space & Security	2,383	1,692	2,615	1,539
Global Services	2,251	2,536	2,697	450
Boeing Capital	114	79	28	63
Segment operating (loss)/profit	**10,033**	**12,102**	**-1,324**	**-11,795**
Pension FAS/CAS service cost adjustment	1,127	1,005	1,071	1,024
Postretirement FAS/CAS service cost adjustment	311	322	344	359
Unallocated items, eliminations, and other	-1,127	-1,477	-2,073	-2,355
(Loss)/earnings from operations (GAAP)	**$10,344**	**$11,987**	**($1,975)**	**($12,767)**
FAS/CAS service cost adjustment *	-1,438	-1,327	-1,415	-1,383
Core operating (loss)/earnings (Non-GAAP) *	**$8,906**	**$10,660**	**($3,390)**	**($14,150)**

(Source of information: Boeing.com)

EXHIBIT 3a:

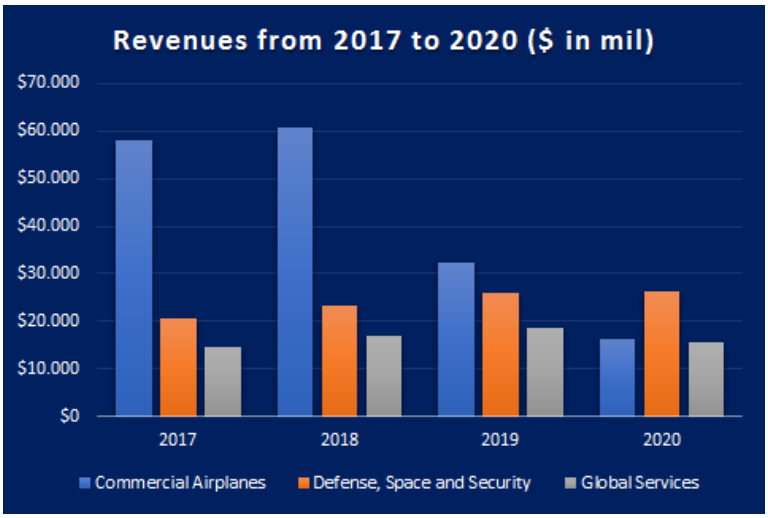
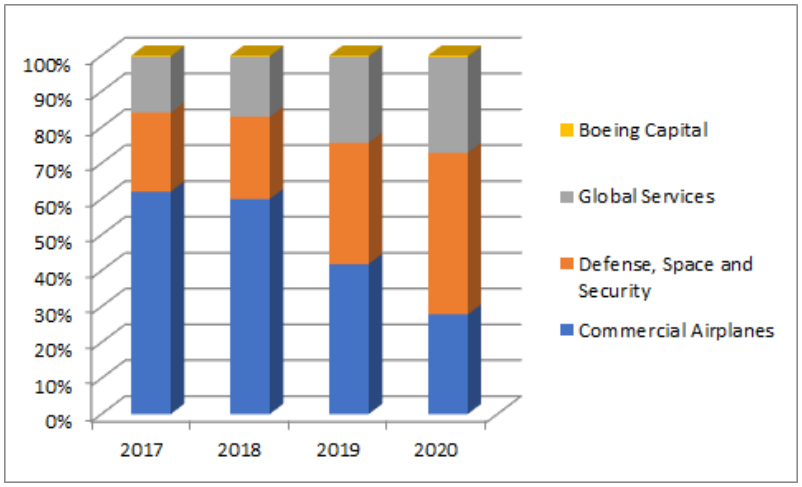


EXHIBIT 3b:



Commercial Airplanes (BCA)

The BCA segment develops, manufactures, and sells commercial jets and provides fleet support services. Its target is the global airline industry.[3] In 2020, BCA reported a loss from operations of $13.8 million. Revenue fell 49.9% to $16.162 million, comprising about 27.7% of Boeing's total revenue. However, in the years 2017 and 2018, prior to the 737 crashes and the COVID-19 pandemic, commercial airplanes were the main source of revenues for Boeing, accounting for approximately 60%. We believe that this segment is most susceptible to economic adversity which could but also has the greatest potential to grow significantly in the few years.

Defense, Space and Security (BDS)

The BDS segment focuses on developing and producing military aircraft, weapon systems for strike and surveillance. It also markets strategic defense and intelligence systems, as well as satellite systems. 83% of this segment's revenue in 2020 comes from its largest customer - the U.S. Department of Defense.[4] The National Aeronautics and Space Administration (NASA) and customers in international defense, civil and commercial satellite markets are also large customers of BDS. Earnings from operations fell by 41.1% in 2020 to $1.53 million, comprising 75% of the total. Revenue grew from $21 million to $26.3 million from 2017 to 2020, comprising 45% of the total for all segments. As the bar chart indicates, revenues from BDS have been stable throughout 4 years, despite the 737 groundings and COVID-19. This segment is highly resilient as it is funded by the government.

Global Services (BGS)

The BGS segment offers a wide array of services and systems, including supply chain, logistics management, engineering, spare parts, upgrades and conversions, digital aviation, and analytics for commercial, defense, and space customers.[5] Earnings from operations dropped 83.3% in 2020 to $450 million, comprising about 22% of the total. Revenue fell 15.8% to $15.5 million, comprising nearly 26.7% of the total for all segments. Although revenue from BGS is fewer than the other 2 sections, it has been quite stable throughout 4 years, implying that this segment is pretty resilient.

Boeing Capital Corporation (BCC)

The BCC segment provides innovative financing solutions. It supports other segments by ensuring its customers have the financing to procure and take delivery of Boeing products and services.[6] Earnings from operations increased 125.0% in 2020 to $63 million, comprising 5% of the total. Revenue rose by 7% to $261 million. BCC's revenue usually comprises little of the total.

III. OPERATIONS

1, Production facilities

Boeing Commercial Airplanes has operations in a great number of cities and countries. However, these are the 3 major production assemblies:[7]

- Everett, Washington: producing the 747, 767, 777, and the 787 airplanes
- Renton, Washington: producing the 737 MAX 7, 737 MAX 8, 737 MAX 9, and 737 MAX 10 models
- North Charleston, S.C: producing second 787 Dreamliner, delivery facilities and stretched 787-10

2, Copyrighted patents

Boeing possesses its patents and the licenses to register patents owned by others, which are essential to its production line. In 2020, Boeing registered 1,464 patents in the United States.[8] In addition, Boeing licenses intellectual property to and from third parties (suppliers or subcontractors). In government contracts, the U.S government has licenses in Boeing's patents. It has the right to authorize others to develop the inventions covered by such patents for government purposes. Boeing also operates on several unpatented research and development, engineering skills, and properties, which means it can be affected by the expiration of intellectual property or the patent license agreement.[9]

3, Raw materials and suppliers

- Boeing is highly dependent on its suppliers and subcontractors for raw materials, spare parts, and subassemblies. The main raw materials for Boeing's production are aluminum and titanium for sheet, plate, forgings and extrusions, and composites (carbon and boron fibers). There are alternatives to these raw materials, but the qualification of the sources takes time. Therefore, Boeing procures or subcontracts with multiple companies as its sole source to secure the supplies.[10]
- None of the supply of Boeing's raw materials is seasonal.[11]
- Boeing relies on a great number of U.S and non-U.S suppliers and subcontractors. Boeing sets a range of criteria, including commercial offerings, ability, capacity, integrity, financial health, geographic location, performance, reliability, quality, on-time delivery, and customer-supplier relations to choose their potential suppliers. Most importantly, suppliers should ensure they can manage sub-tier supply chains. Suppliers must follow Boeing's standards and practices. To become the suppliers, their production systems also need an inspection by Boeing, the Federal Aviation Administration, and a third party. [12]
- Boeing's primary suppliers are: *Spirit AeroSystems* (fuselages - aerostructures), *Precision Castparts Corp*. (aerostructures), *Triumph Group* (aerostructures), *Pratt & Whitney* (aircraft engines), *Collins Aerospace* (components & parts), *General Electric Co.* (aircraft engines), and *Rolls-Royce* (aircraft engines). [13]

4, Human resources

According to a report of December 31, 2020, Boeing's workforce is 141,000 employees. There are 56,000 engineers and 47,000 union members. [14]

To attract talented engineers, Boeing provides its engineers with an average yearly pay of $103,986, which is 49% above the national average. [15] Besides, Boeing also offers health and insurance benefits, retirement savings, a Learning Together Program, employee discounts, and multiple career opportunities. [16]

During COVID-19, Boeing takes proactive measures to keep the workspace and the community safe. Boeing is enhancing the cleaning of high-touch areas and impacted sites. It also imposes rigorous safety protocols including face covering, physical distancing, voluntary temperature screening, and travel updates. Work from home is encouraged for employees who can work effectively at home. [17] Boeing connects with its employees through Worklife and Boeing Now. [18]

5, Regulations

Government contracts: Boeing has contracts with multiple U.S government entities, including NASA, the U.S military, and FAA. It also has contracts with several non-US government agencies. In case the governments terminate the contracts at their convenience, Boeing is entitled to payments for completed work and cancellation costs. In case the governments terminate the contracts for default (Boeing does not meet the requirements), the U.S. government would pay only for the acceptable work. Boeing can be demanded to compensate for the difference between the original contract price and the cost to re-procure the contract items. [19]

Commercial Aircraft: In the U.S, BA's commercial aircraft must comply with FAA regulations. Outside the U.S, Boeing must follow the requirements of each nation. [20]

Environment: To reduce the impact of flying, Boeing reduces carbon emissions and uses resources prudently through innovative solutions across its product life cycle, in its factories, and at offices. In 2020, Boeing strives

towards the philosophy of clean air, water, and land. Boeing focused on operations resource conservation and supported non-governmental organizations, communities, and industry associations. Parts of Boeing's airplanes are nearly 90% recyclable for reuse or scrap.

Boeing’s Environment Policy stated that Boeing is committed to:

- Conform to environmental laws, regulations, and Boeing policies and procedures.
- Prevent pollution by conserving energy and resources, recycling, reducing waste, and developing fuel-efficient strategies and designs for its products.
- Continually improve our environmental management system.
- Join hands with stakeholders to promote environmental preservation. [21]

IV. EXECUTIVES

David Calhoun - President & CEO (since Jan 2020)

- ➢ A member of Boeing's board of directors since 2009; chairman of the board for 2 months prior to becoming the CEO. (Replaced David Muilenburg)[22]
- ➢ Other/Previous positions:[22]
  - Chairman of The General Electric Company, CEO of GE Infrastructure
  - Senior management at The Blackstone Group investment firm & Nielsen Holdings
  - A member of the Business Roundtable
- ➢ After the 737 MAX grounding, Calhoun has been working on mending relationships and improving transparency with Boeing's airline customers, international regulators, and President Trump, and trying to get 737 Max necessary permissions to be back in the air as soon as possible. He claims to focus on producing jets at a pace factory can handle and fixing systemic cultural issues[23]. Calhoun proved his capabilities by leading Boeing through the global pandemic, building up its cash reserves, suspending its dividend, and cutting 16,000 jobs mostly through voluntary buyouts[24,25]. The BoD extended his tenure for 5 years which indicates an absolute vote of confidence.

Stanley A. Deal - President & CEO, Boeing Commercial Airplanes (since Oct 2019)

- ➢ Executive vice president of The Boeing Company, a member of the Executive Council, and senior executive in the Pacific Northwest. (Replaced Kevin McAllister)[22]
- ➢ Prior leadership roles:[22]
  - Senior management at BCA and Commercial Aviation Services (a former services division of BCA). Under Deal's leadership, CAS generated record performance in 2014 and 2015.
  - VP: Asia Pacific Sales, BCS Sales, and Marketing Operations, Global Network Sales
- ➢ After taking over the business, Deal has been working on mending relationships with airlines that were most shaken by the 737 Max accidents in order to regain confidence in Boeing's most important product. His wide range of accumulated experience regarding Boeing's business and customer skills proved to be suitable for his current position.[26]
- ➢ He previously established and led Boeing Global Services (July 2017) as a new aerospace services development and delivery model for commercial and government customers worldwide.

Leanne G. Caret - President & CEO, Boeing Defense, Space & Security

- ➢ A 2019 inductee of the Women in Aviation International Pioneer Hall of Fame.[27]
- ➢ A fellow of the Royal Aeronautical Society and an associate fellow of the American Institute of Aeronautics and Astronautics.[27]
- ➢ A member of the George W. Bush Women's Initiative Policy Advisory Council, the board of directors for the Kansas State University Foundation and FIRST®.[27]
- ➢ Previous positions:[27]
  - President of Global Services & Support organization
  - CFO for Boeing's Defense and Security
  - Senior management at Vertical Lift, H-47 Programs, and Global Transport & Executive Systems.
- ➢ Caret stepped into the Defense division in 2016 when the company lost a lucrative contract for the US Air Force's next-generation bomber. Under Caret's leadership, BDS has logged many new aircraft orders and contracts and become a model pupil for Boeing during COVID-19. As for production efficiency under the ongoing pandemic, the BDS division has made numerous adjustments for its workforce, second-tier suppliers, and below in order to maintain its revenue's upgoing trend.[28]

INDUSTRY OVERVIEW: AEROSPACE & DEFENSE

I. INDUSTRY BACKGROUND

Industry Classification and Output Description: The Aerospace & Defense industry can be classified into civil aviation and the military aviation sectors. The civil aviation market includes production, sales, and services of commercial aircraft, while the military aviation market comprises designation, production of military weapons, and systems for different nation's purposes. Production of general aircraft and space vehicles for both business and military uses is also included in the industry.[29]

Major Players: Boeing, Airbus, Raytheon, Northrop Grumman, and General Dynamics. Boeing and Airbus could be deemed as a duopoly in the aircraft manufacturing industry, having a combined share of 91% (Forbes) in the commercial aircraft market globally.[30]

Competition by segments:

- **Commercial Airplane:** The airline market is extremely competitive. Boeing's biggest rivals are Airbus, Embraer, and other entrants from Russia, China, and Japan. They offer competitive products and target the same customers as Boeing. Now, Boeing is focused on returning safely 737 MAX to operation, enhancing cost-reduction efforts, and providing customers with greater values of products/services.

- **Defense, Space, and Security:** BDS faces competition primarily from Lockheed Martin, Northrop Grumman, Raytheon Company, General Dynamics, and SpaceX. BAE Systems and Airbus Group are non-U.S companies. However, they started to partner with U.S defense companies and enhance their North American operations to gain a foothold in the U.S market. Boeing occasionally collaborates with other companies that are competitors in other areas to provide customers with the best mix of capabilities to address specific requirements.

- **Global Services:** BGS expects the market to remain highly competitive in 2021, and intends to grow market share by guaranteeing a high level of customer satisfaction and productivity.

Regional Segment:

- North America (U.S., Canada, Mexico)
- Europe (Germany, France, U.K., Italy, Spain, Rest of Europe)
- Asia-Pacific (China, Japan, India, Rest of APAC)
- South America (Brazil and Rest of South America)
- The Middle East and Africa (UAE, South Africa, Rest of MEA)

II. INDUSTRY SIZE

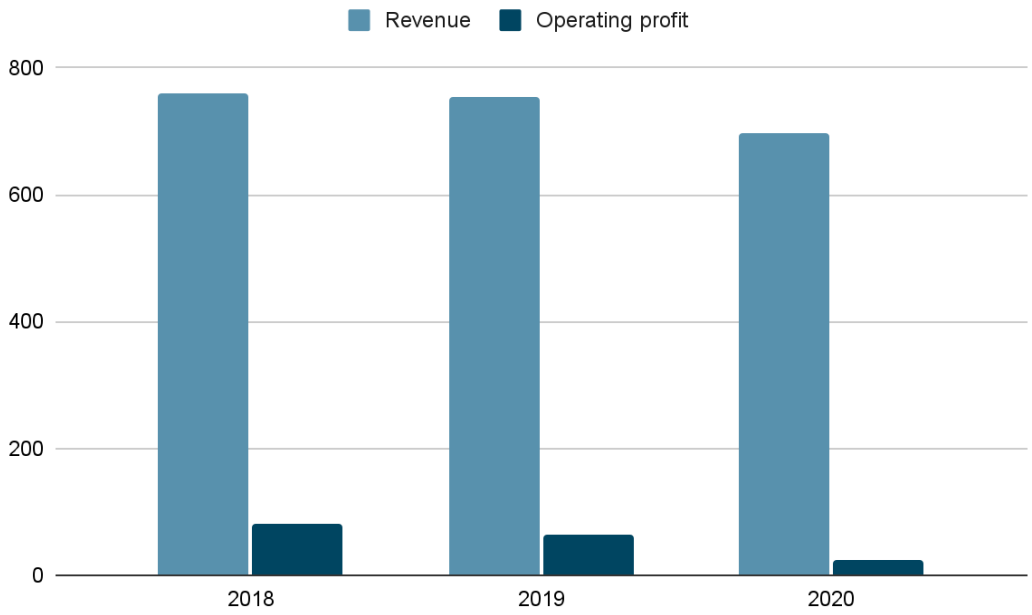
I. Global Basis:

According to Fiori Market reports, the Aerospace and Defense Industry was valued at $736.36 billion in 2020, comprising $298.0 billion worth from Aerospace Market and $438.34 billion worth from Defense Market.
Global revenue registered at 697 billion USD in 2020. Although 2018 registered the highest revenue since the record of 2014, the Covid-19 pandemic that started in 2020 has had a significant impact on the A&D industry operation. Travel restrictions in many nations strongly affected the aviation industry, leading to a reduction in demand for commercial aircraft manufacturing. Besides, countries also reduced their military budget during the economic downturn. Operating profit in 2019 dropped 20%, while 2020 saw a loss of 8% in revenue and a plummet of 61% in operating profit.

EXHIBIT 4

	2018	2019	2020
Revenue	760	754	697
Operating profit	81	65	25

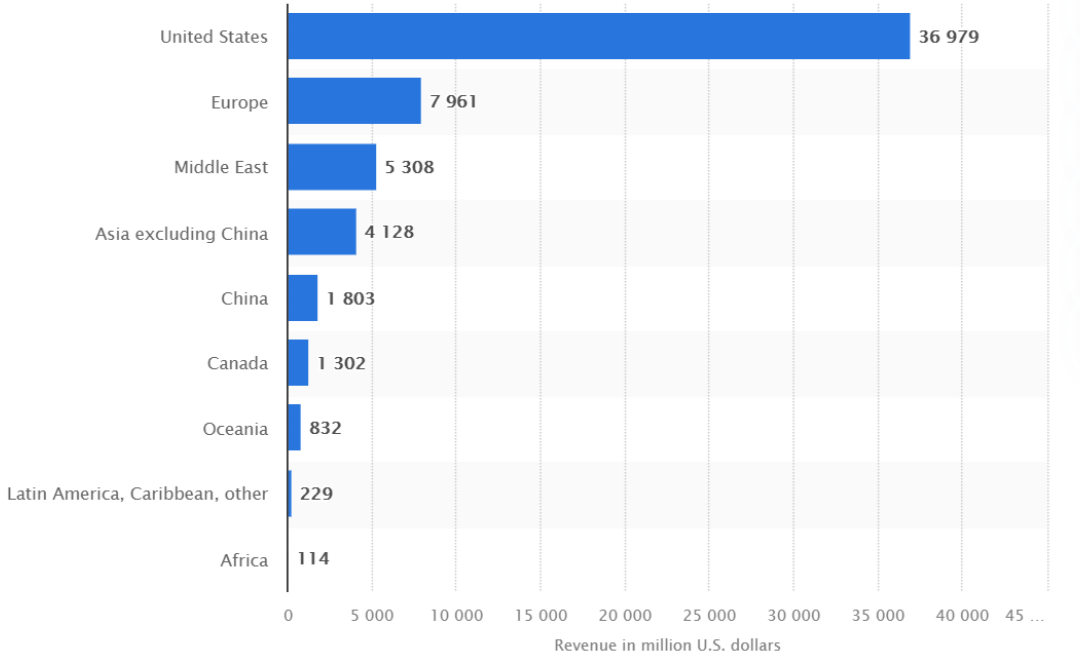
Data reported in billion USD[31]



II. US Market:

The headquarters of Boeing is in Chicago, United State. The US market is also the most important market of Boeing, contributing over 63% of the firm's total revenue, and the biggest market for the aerospace and defense industry. As reported by the Mordor Intelligence team, the US Aerospace and Defense market was valued at $416.63 billion in 2020 (accounted for 60% of the global market).

EXHIBIT 5



Boeing's global revenue in FY 2020, by region or country (in million U.S. dollars)[30]

Revenue in past years:

EXHIBIT 6	2018	2019	Change
US gross domestic product value	378	396	4.8%
% nation's GDP	1.8	1.8	0%

Data reported in billion USD[32]

III. INDUSTRY GROWTH

Despite the unprecedented nature of the Covid-19 pandemic, we could expect a recovery from the aviation industry as the industry has proven resilient throughout many economic downturns in history, including the SARS pandemic and the global financial crisis. Restrictions is currently being lifted in some countries and might be less severe compared to 2020, but it will still likely have negative impacts on the aviation industry, leading to a modest growth rate. The outlook for the defense market, in contrast, is more positive, and we can expect moderate growth. There is a high probability that the budget allocated for the military will rise in many countries including the USA, UK, France, Germany, and some European countries.

Overall market value: According to The Business Research Company reports, the global A&D market is projected to grow at 5.2% CAGR to $774.54 billion in 2021, and reached $973.2 billion in 2025 at a CAGR of 6%. By segmentation, the aerospace market is expected to reach $430.9 billion in 2025 at a rate of 7.7%, while the Defense market would reach $542.33 billion in 2025 at a CAGR of 5%. In their market outlook reports, Boeing

also projected a value of $3 trillion for the support and service 10-year market, decreasing 2.2% compared to the 2019 forecast, and $2.6 trillion for the defense and space 10-year market between 2020 and 2029.

IV. MARKET TRENDS

➢ **Commercial Aerospace Industry:**

Boeing expects the aviation industry to recover back to the 2019 level within 3 years and would take a few more years to go back to the long-term growth trend. As many emerging market economies mature, consumer's expenditure on other economies will increase, further fostering the demand for the travel industry. The aviation industry, which remains a constitutive part of global transportation systems, would be beneficial from this trend. Other trends regarding the growth factors of the industry include:

People are eager to travel. After a long period of social distancing, it is understandable that people will start seeking for traveling as their past plans had been canceled. "The prolonged period at home during COVID-19 will continue to increase people's sense of adventure and their search for escapism. Our global research shows that people have a strong desire to travel in 2021, with 70 percent of people planning their break.", said Pablo Caspers, Chief Travel Officer, eDreams ODIGEO. However, it is expected that tourists will first prefer traveling domestically or close to destinations that could be reached by private or public vehicles.[33,34] A study from Longwood International reported that of the surveyed American travelers, 45% reduced their travel plans, and 22% changed from flying to driving for the next 6 months.[35] Therefore, it is likely that the commercial aerospace industry will recover but at a rather modest pace in the following years.

Positive signs about the Covid-19 pandemic. At the moment, Covid-19 vaccines are widely distributed, with at least 199 countries have started vaccinating.[36] Developing countries also invest in developing effective types of vaccines. It is predicted that the UK and US will have all adults vaccinated by the end of the second quarter and Europe will reach the same milestones at the end of the third quarter.[37] As reported by the UN health agency, cases and deaths have dropped in seven consecutive weeks. The pandemic is turning less intense and we can expect a soon recovery of global economics after a period of recession.

➢ **Defense:**

Most major defense spending countries are likely to increase their budget for the defense sector. The requested spending for the military in the USA for FY 2022 is $715 billion, up from $704 billion (or about 1.5%) in FY 2020. The US also ranked first in military spending - representing 39% of the total global spending in 2020 according to Statista. In Europe, the elevated levels of the terror threat and continuing tensions with Russia marked a turning point, and we expect defense budgets to grow modestly in 2021 and beyond. The UK, Germany, and France all confirmed their intention to reinforce their defense capabilities.[31]

➢ **Space:**

Satellite broadband, space exploration, and militarization to drive growth.[38] The number of successful space launches in the first half of 2020 is comparable with that of 2019 despite the pandemic. As stated by a Deloitte analysis: "As funding continues to increase and costs decline, the space industry is likely to experience increased opportunities, primarily in satellite broadband internet access...Space exploration is also expected to continue to evolve and grow in 2021 due to declining launch costs and advances in technology."

V. COMPETITIVE FORCE MODEL

Porter's Five Force Summary (EXHIBIT 7)

Force	Key Drivers	Effect on industry profit
Intensity of rivalry	High concentration Competitiveness in non-price-based factor	**-**
Threats of new entrants	High capital cost High switching cost Many barriers to entry	**+**
Bargaining power of suppliers	Highly dependent on five suppliers of aero-engines. Suppliers of other components have less market power.	**0**
Bargaining power of buyers	Governments of developed countries have regulatory power. A large number of airline companies, but a small number of dominant suppliers. Long-term contracts	**-**
Threats of substitutes	No real substitute for aircraft and defense products and services	**+**
Overall analysis		**0**

Overall, the Aerospace and Defense industry has a neutral environment, with both positive factors and negative ones regarding the firm's profit in the industry. As Boeing is benefiting much from factors such as economies of scale (production assemblies in over 65 countries), government regulations (US subsidies) plus being a leading firm in technology development, Boeing has a solid position in this industry. In addition, Boeing along with Airbus makes up the duopoly in the Aerospace industry.

1. Force 1: Intensity of Industry Rivalry

The concentration of rivals. There were a total of 23 A&D firms listed in the Fortune 1000 2019 and 13 firms listed in the Fortune 500.[39] Although a small number of firms dominated the industry, there are hundreds of smaller firms competing at all levels[40]. In the aerospace market specifically, Airbus and Boeing combine the duopoly. The five biggest defense contractors are Lockheed Martin, Raytheon, General Dynamics, Boeing, and Northrop Grumman.

Product differentiation. Products in the industry are highly differentiated, as systems and weapons are designed based on each nation's needs. Firms also have different technology in constructing aircraft. Commercial airplane models are variable in scales, capacity, engines, design, and speed.

Switching cost. The cost of switching from one firm to another in the A&D industry is significant. This cost includes transaction costs, compatibility costs, learning costs, contractual costs, uncertainty costs, psychological costs, and search costs.[41]

Price-based rivalry. There isn't clear evidence of price war in the aerospace industry, while in the defense industry, companies compete in prices to bid for government contracts and private programs.[42]

Non-price-based rivalry. Existing firms need to compete vigorously in other categories, including technological advancement, brand identity, and scale, to secure their position and market share. Therefore, firms need to invest much in R&D and scale of production to benefit from economies of scale.

Summary of rivalry effects. The product differentiation and switching costs decrease rivalry among firms in the industry. However, competition in non-priced-based factors and a large number of firms in the industry increase the competitiveness. Therefore, the overall rivalry industry effect is moderate to high.

2. **Force 2: Threats of New Entrants**

Barriers to entry. To join the industry, firms need an enormous amount of resources at the outset. The resources are used to purchase assets, invest in R&D, hire specialists, and marketing. New firms also face the challenge of finding suppliers and forming relationships with customers and distribution channels as they have established long relationships with existing firms.

EXHIBIT 8

Analysis of Cost Endured By A Customer When Purchase Is Made From A New Entrant Or An Incumbent OEM[41]

Cost Type	New entrant	Incumbent
Search	Significant	Nominal
Transaction	Nominal	Nominal
Compatibility	Significant	Insignificant
Learning	Significant	Nominal
Contractual	Significant	Insignificant
Uncertainty	Significant	Insignificant
Psychological	Significant	Insignificant
Shopping	Significant	Insignificant
Political	Significant	Nominal

Economies of scale. Large A&D firms often require a large number of capital assets, R&D costs, and human resources to operate. Consequently, these firms are beneficial from the economies of scale as fixed costs per unit reduces when production increases. This can discourage small firms from entering the industry.

Barriers to exit. Barriers to exit the A&D industry are high due to its capital-intensive nature. Government subsidies and long-term contracts can also deter firms from exiting the industry.

Government regulation. Governments provide financial support for both new entrants and incumbents through different policies. For example, the UK government provides a "risk-sharing, repayable investment in the form of

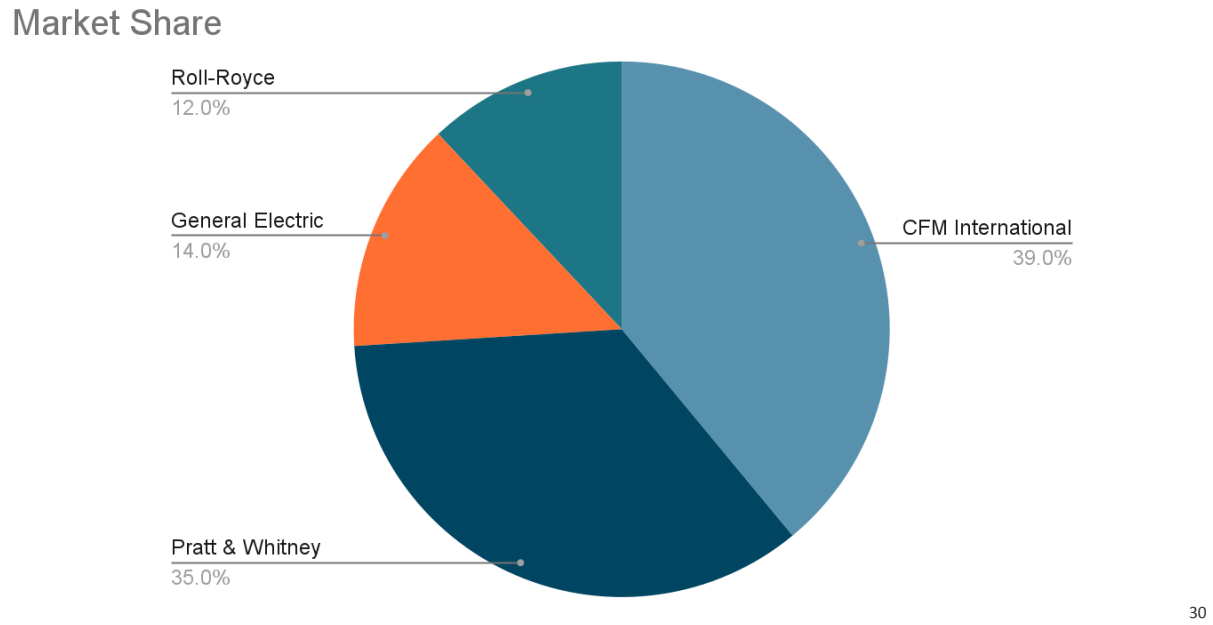
launch investment with repayments through a levy on sales." [43] Findings show that support from the USA government for the aerospace industry can be seven times as much as that of European governments.

Summary of threats of new entrants effect. There are many factors related to resources and finance that pose barriers to aspiring entrants, so incumbents are protected from added competitiveness, implying sustained profits. The overall effect is low.

3. Force 3: Bargaining Power of Suppliers

Supplier concentration. The aero-engine market is characterized as an oligopoly. Leading firms are CFM International, Pratt & Whitney, General Electric Aviation, and Roll-Royce. Due to the limited number of suppliers, each of these firms has some market power. Other suppliers including aerostructure and part&components are more diverse and have less significant power. However, these firms all need to compete vigorously to win new projects of large firms such as Boeing and Airbus as they are much more profitable than those of their smaller counterparts.

EXHIBIT 9



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Product differentiation. Products are differentiated as parts, components, engines, and structures provided for firms under contracts are designed with different specifications, sizes, and materials.

Switching cost. Switching costs are high when firms decide to change suppliers. They have to incur the high cost of learning, contractual, and uncertainty.

Summary of bargaining power of supplier. Despite the low concentration of suppliers, markets like aerospace are dominated by the duopoly of Boeing and Airbus, which makes them have even higher bargaining power as suppliers compete to be part of their big programs. Overall, the bargaining power of suppliers is moderate.

4. Force 4: Bargaining power of buyers

Size of buyers. The majority of buyers of firms are governments, airlines, and space organizations such as NASA. When it comes to governments, governments of developed countries tend to have more power. For example, the

US is the largest market for both Aerospace and Defense. Consequently, they have much power to set criteria and prices for their suppliers and select the most lucrative option. Besides, governments could set the requirements of quality and also act as regulators to gain a better deal from domestic firms.[44] While there are plenty of airline companies, there are only a few airplane manufacturers that are large-scale and have advanced technology that firms can choose from.

Size of orders and time of contracts. A&D firms usually sign long-term contracts with their customers and the contracts can last up to 10 years. The orders customers make are also highly valuable and in large numbers. Therefore, A&D firms might refrain from exploiting their market power excessively so that they can win more contracts.

Price-sensitivity. Buyers in the A&D industry are not as price-sensitive as those in other industries. However, they put more emphasis on the quality of the products and brand identity.

Switching cost. Switching cost is likely to be high for orders that are custom made. Contracts can take up to years to be made and the production procedure also takes time to test the quality and meet the requirements of buyers.

Summary of bargaining power of buyers. Governments of major countries in the industry have more power and airline companies have less power due to their large numbers. The time and size of contracts can reduce the market power of A&D firms. Overall, the bargaining power of buyers in A&D is moderate to high

5. Force 5: Threats of substitute products and services

Substitutions of airplanes are other vehicles and transportation that can perform trips between far places, including trains, ships, and cars, but these vehicles cannot fully replace airplanes given the passenger capacity and time to travel. Moreover, the majority of buyers of aircraft are airlines, and only a small portion of organizations or individuals purchase for private purposes. Therefore, the effect of substitution is low. In the defense market, it is mandatory that countries invest in their defense sector in case of rising tensions with other nations, so the demand for this market is high. Consequently, the effect of substitution is also low.

INVESTMENT THESIS

Recommendation: We recommend John Doe should invest in BA for the long term. We believe Boeing is undervalued in the market with substantial 3-12 month upsides. Our target price of Boeing is $296 per share based on our Comparable analysis with Airbus (Exhibit 21) and our Discounted cash flow analysis (Exhibit 22) Therefore, we recommend a buy.

Rationale:

1, Massive backlog of orders and large switching costs prevent customers from shifting to alternatives.

2, Improved situation of COVID-19 pandemic combined with a pent-up desire for traveling offers significant growth potential.

3, The return of 737 MAX should be a significant growth driver for BA in future years, bringing the company back to its golden time.

1, Massive backlog of orders and large switching costs prevent customers from shifting to alternatives.

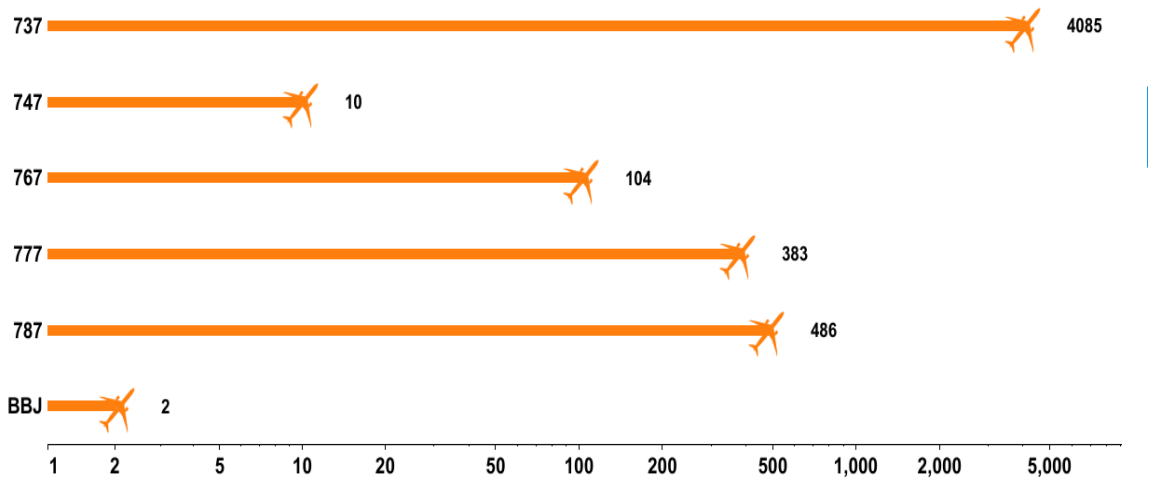
***Massive backlog provides great visibility into future revenues.**

The total backlog as of July 2021 is $363,466B, far outpacing its expected revenue in 2021 ($65.944B - Exhibit 12). This is the implication of strong visibility into future revenues. The firm backorders is an economic moat of Boeing. Once orders soar and cancellations decline, Boeing promises a bright economic outlook.

As of July 2021, backorders for 737 MAX are 4,085 airplanes (about 85% of the company's backorders). To backorder Boeing or Airbus, customers need to wait for at least 6-8 to receive the airplanes. Most major airlines, including American Airlines (AAL) and Southwest (LUV), said they had not changed their orders despite the deadly crashes of 737 MAX.[45]

EXHIBIT 10: Boeing order backlog ($ mil)		
	6/30/2021	**12/31/2020**
Commercial Airplanes	$285,332	$281,588
Defense, Space and Security	$58,705	$60,847
Global Services	$19,029	$20,632
Unallocated items, eliminations, and others	$400	$337
Total backlog	**$363,466**	**$363,404**
Contractual backlog	$342,261	$339,309
Unobligated backlog	$21,205	$24,095
Total backlog	**$363,466**	**$363,404**

EXHIBIT 11: Commercial Airplane Backorders as of 31st July 2021 [46]



***High switching costs prevent customers from canceling orders and finding alternatives**

As there are only two major suppliers - Boeing and Airbus - airlines tend not to ruin relations with one. Moreover, with the high costs and high levels of backorders, it is almost impossible for all Boeing orders to be canceled and switched to Airbus. Customers are also reluctant to cancel orders because of large down payments. Airlines would have to wait for roughly 8 years for order and this would adversely affect the operations and schedules of companies. Furthermore, Airbus has even a longer waiting list for airplanes. Switching from Boeing to Airbus would put an airline at the back of the line to have its order filled. To shift from Boeing carrier to Airbus carrier also means huge fixed costs (crew retraining, new inventory of spare parts).

Large switching costs even serve as a large impediment to airlines during COVID-19. A case in point is Garuda, Indonesia's largest airline. It intends to cancel 737 MAX orders as its passengers might lose confidence in the MAX 8. However, as the airliner is burning cash and has broken even, canceling its $4.9 billion for the Boeing 737 MAX is a real challenge.[47] Southwest (LUV) has flown nothing but 737 and 737 MAX. Therefore, it might have to undergo a great transformation including retraining programs if it switches to another company such as Airbus.

2, Improved situation of COVID-19 pandemic combined with a pent-up desire for traveling offers significant growth potential.

***Pent-up demand for traveling offers great opportunities for Boeing**

- *COVID 19:* As the U.S China, Russia, and parts of Europe have recovered, domestic leisure travel has come back. With 199 countries having been vaccinated (as our industry analysis states), the pandemic is becoming less critical. The International Air Transport Association (IATA) predicts that by 2023, global passenger traffic will surpass pre-Covid-19 levels, thanks to pent-up desire, coronavirus vaccinations, and reviving economic weather. In our industry analysis, we already point that as many emerging market economies mature, consumer's expenditure on other economies will soar, further boosting the demand for the travel industry.

- *Leisure travel:* After nearly two years of the pandemic, in 2021, when the situation shows positive signs, it's highly likely that people will seek traveling as their past plans were delayed. Pablo Caspers, Chief Travel Officer, eDreams ODIGEO also said that his global research indicated that people have a strong desire to travel in 2021, with 70 percent of people planning their traveling. However, people tend to favor domestic travel. This tendency

is due to the international movement restrictions in several countries such as Peru, Vietnam, India, Australia, etc… Also, international travel during Covid 19 is risky as travelers may get stuck in foreign countries. With high demand for domestic leisure travel, Boeing can derive much benefit as it offers a wide range of narrow-bodied airplanes that are suitable for short flights.

- *Business travel:* Not only does the desire for leisure travel increase, the demand for business flights can also soar. Teleconferencing apparently has its limits. Also, many people plan to have a job change. Therefore, in 2021-2022, when the economy is recovering and the pandemic is less tense, they will travel for effective business. According to Forbes, a survey of more than 900 Americans completing the week of June 28 revealed that 3/4 of the respondents who took four or more work-related trips in 2019 said they plan to take their next domestic flight within three months. [48] Almost 9 out of 10 said they wish to take at least as many business trips in the next year as they had in the year prior to the Covid-19 pandemic. [49] Aviation industry and consequently Boeing can benefit greatly from this trend.

A strong industry backdrop can help Boeing's sales recover and grow greatly in 2021 and beyond.

3, The return of 737 MAX should be a significant growth driver for Boeing in future years, bringing the company back to its golden time.

***Background information:**

Oct 29, 2018 – Boeing 737 MAX crashed shortly after takeoff, killing all 189 onboard on a flight from Jakarta to Pangkal Pinang

Lion Air Flight 610

Mar 10, 2019 – Boeing 737 MAX crashed shortly after takeoff, killing all 157 onboard on a flight from Addis Ababa to Nairobi

The problem came from MCAS (Maneuvering Characteristics Augmentation System) and pilot training. To increase fuel efficiency on the 737 MAX, the plane's engines were positioned closer to the nose, thus increasing stall risk. However, the system was triggered by a false alarm. Also, flight crews hadn't been adequately trained

to use the new system of 737 MAX. Black box findings show pilots tried to stop the MCAS system using an incorrect procedure – the procedure for older 737's.

* **Boeing has records of quick recovery and development after aircraft groundings**

In January 2013, there were six incidents of battery fires and fuel leaks aboard 787's. In consequence, Boeing 787's faced international groundings for more than 4 months. Although Boeing did not disclose the total amount of money it had to pay out to companies, analysts estimated the figure was around $500 million. These grounding costs must have been much lower after insurance. After the second review process, Boeing 787 Dreamliner recovered with the reputation of a safe and fuel-efficient airplane. This reputation helped sales rise quickly and outpaced the initial goal of 1,400 orders.

*** The return of 737 MAX is a significant growth driver for Boeing**

As shown in the 787 Dreamliner incident, the airline opinions on the company's products are unlikely to be affected by the grounding situation, given the strong brand name of Boeing. Moreover, the problem relating to 737 crashes is the MCAS system while that of 787 focused on fuel tank and battery, which took months to pinpoint. Currently, Boeing is fixing the 737 MAX by working on a hotfix for the MCAS system. The company is also introducing a retraining program for the pilot crews to use the MCAS system on the 737 MAX properly. The 737 MAX had been under strict safety revision before the FAA approved its comeback.

Last year, Boeing lost nearly $12 billion. However, this large amount is believed to be the result of not only 737 MAX groundings but also the profound impact of the COVID-19 pandemic. Once the grounding order is lifted, Boeing's share price can see positive outcomes. Boeing reported that 175 countries have recertificated the MAX for commercial flight. [50] From 18th November 2020, Boeing 737's were allowed to return to the sky and the revenues reported showed signs of recovery. In the first quarter of 2021, the revenue was $15,217 million while that in the second quarter was $16,998. (11.7% change). 737 backorders are also the largest (Exhibit 11) and the 737 family serves as the biggest driver for the growth of Boeing. Thus, Boeing can expect significant growth in revenues once Boeing can deliver the planes it is producing.

Furthermore, customers tend to favor domestic travel post-Covid over international flights as explained above in rationale 2. Therefore, sales of narrow-bodied airplanes for shorter hops such as the Boeing 737 MAX are likely to boost in 2021. Moreover, 175 countries have approved the resumption of the MAX for commercial flight, and that it has shipped more than 130 MAX jets since November. The grounding order is lifted, which means Boeing can deliver planes to customers. 40-60% of revenue from 737 MAX comes at delivery. The financial picture of Boeing is remarkably brighter.

We believe the mass recertification, its large backorders, and sales will justify the return of 737 MAX as one of the greatest growth drivers for Boeing.

FINANCIAL FORECAST AND VALUATION

I. FINANCIAL STATEMENT*

EXHIBIT 12

INCOME STATEMENT									
(Dollars in millions, except per share data)	**2017**	**2018**	**2019**	**2020**	**2021***	**2022***	**2023***	**2024***	**2025***
Commercial Airplanes	58,014	60,715	32,255	16,162	21,425	28,924	33,262	36,589	38,418
Defense, Space & Security	20,561	23,195	26,095	26,257	29,293	32,808	36,089	39,698	43,668
Global Services	14,581	17,018	18,468	15,543	15,030	15,782	16,571	18,228	21,873
Additional Revenues	849	199	(259)	196	196	196	196	196	196
Total revenues	**94,005**	**101,127**	**76,559**	**58,158**	**65,944**	**77,709**	**86,118**	**94,710**	**104,155**
Cost of Goods Sold (COGS)	(76,612)	(81,490)	(72,093)	(63,843)	(63,102)	(63,722)	(70,617)	(76,715)	(84,365)
Gross profit	**17,393**	**19,637**	**4,466**	**(5,685)**	**2,842**	**13,988**	**15,501**	**17,995**	**19,789**
General and administrative expense	(4,095)	(4,567)	(3,909)	(4,817)	(4,933)	(4,663)	(4,306)	(4,736)	(5,208)
Research and development expense, net	(3,179)	(3,269)	(3,219)	(2,476)	(1,915)	(3,108)	(3,445)	(2,841)	(3,125)
(Loss)/earnings from operations	**10,119**	**11,801**	**(2,662)**	**(12,978)**	**(4,006)**	**6,217**	**7,751**	**10,418**	**11,457**
(Loss)/income from operating investments	204	111	(4)	9	0	0	0	0	0
Gain on dispositions	21	75	691	202	219	219	219	219	219
Other income	123	92	438	447	0	0	0	0	0
Interest and debt expense	(360)	(475)	(722)	(2,156)	(1,996)	(1,996)	(1,996)	(2,281)	(2,281)
(Loss)/earnings before income taxes	**10,107**	**11,604**	**(2,259)**	**(14,476)**	**(5,783)**	**4,440**	**5,974**	**8,356**	**9,395**
Income tax benefit/(expense)	(1,649)	(1,144)	1,623	2,535	1,214	(932)	(1,254)	(1,755)	(1,973)
Net (loss)/earnings	**8,458**	**10,460**	**(636)**	**(11,941)**	**(4,568)**	**3,508**	**4,719**	**6,601**	**7,422**
EBITDA	12,514	14,193	734	(10,074)	(2,138)	8,378	10,123	13,005	14,280
Number of basic outstanding shares	603	579	565	569	590	590	590	590	590
Number of diluted outstanding shares	610	586	565	569	590	590	590	590	590
Basic (loss)/earnings per share	**14.0**	**18.1**	**(1.1)**	**(21.0)**	**(7.7)**	**5.9**	**8.0**	**11.2**	**12.6**
Diluted (loss)/earnings per share	**13.9**	**17.8**	**(1.1)**	**(21.0)**	**(7.7)**	**5.9**	**8.0**	**11.2**	**12.6**

EXHIBIT 13

BALANCE SHEET				
FY is January-December. All values in $M	2017	2018	2019	2020
Assets				
Current Assets				
Cash & Short Term Investments	9,992	8,564	10,030	25,590
Total Accounts Receivable	11,397	14,364	12,471	10,051
Inventories	61,388	62,567	76,622	81,715
Other Current Assets	2,417	2,335	3,106	4,286
Total Current Assets	**85,194**	**87,830**	**102,229**	**121,642**
Non-Current Assets				
Net Property, Plant & Equipment	12,672	12,645	13,684	13,072
Total Investments and Advances	1,260	1,087	1,092	1,092
Long-Term Note Receivable	3,249	2,662	2,380	1,936
Intangible Assets	8,132	11,269	11,398	10,924
Other Assets	1,534	1,582	2,159	3,384
Total Non-Current Assets	**27,168**	**29,529**	**31,396**	**30,494**
Total Assets	**112,362**	**117,359**	**133,625**	**152,136**
Liabilities & Shareholders' Equity				
Current and Non-Current Liabilities				
Short-term debt	600	1,895	6,361	268
Current portion of long-term debt	735	1,295	1,231	1,693
Accounts Payable	12,202	12,916	15,553	12,928
Income Tax Payable	380	485	670	43
Other Current Liabilities	60,731	64,999	73,497	72,348
Long-Term Debt	9,782	10,657	20,940	62,974
Provision for Risks & Charges	22,016	19,907	20,816	18,545
Deferred Taxes	1,867	1,452	(270)	924
Other Liabilities	2,015	3,059	2,444	402
Total Liabilities	**110,649**	**116,949**	**141,925**	**170,211**
Equity				
Total Shareholders' Equity	1,656	339	(8,617)	(18,316)
Accumulated Minority Interest	57	71	317	241
Total Equity	**1,713**	**410**	**(8,300)**	**(18,075)**
Liabilities & Shareholders' Equity	**112,362**	**117,359**	**133,625**	**152,136**

EXHIBIT 14

CASH FLOW STATEMENT				
Fiscal year is January-December. All values USD Millions.	2017	2018	2019	2020
Operating Activities				
Net Income before Extraordinaries	8,458	10,460	(636)	(11,941)
Depreciation, Depletion & Amortization	2,047	2,114	2,271	2,246
Other Funds	589	464	548	8,620
Changes in Working Capital	2,252	2,284	(4,629)	(17,335)
Net Operating Cash Flow	**13,346**	**15,322**	**(2,446)**	**(18,410)**
Investing Activities				
Capital Expenditures	(1,870)	(1,791)	(1,961)	(1,303)
Net Assets from Acquisitions	(324)	(3,230)	(455)	-
Sale of Fixed Assets & Businesses	92	155	805	296
Purchase/Sale of Investments	38	291	101	(17,341)
Other Uses	-	(11)	(13)	(18)
Other Sources	6	-	-	-
Net Investing Cash Flow	**(2,058)**	**(4,586)**	**(1,523)**	**(18,366)**
Financing Activities				
Cash Dividends Paid - Total	(3,417)	(3,946)	(4,630)	(1,158)
Change in Capital Stock	(8,925)	(8,919)	(2,593)	36
Issuance/Reduction of Debt, Net	1,124	1,365	13,218	36,250
Other Funds	(132)	(257)	(263)	(173)
Net Financing Cash Flow	**(11,350)**	**(11,757)**	**5,732**	**34,955**
Exchange Rate Effect	80	-53	-5	85
Net Change in Cash	**18**	**-1,074**	**1,758**	**-1,736**

II. COMPARABLE COMPANY ANALYSIS**

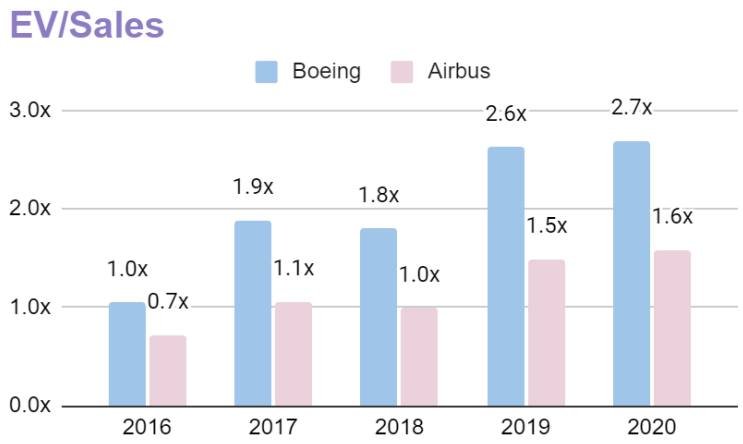
Airbus is one of the greatest rivals of Boeing. Both are key players in the aerospace and defense industry and big commercial aircraft manufacturers. In the aviation industry, the competition of Boeing and Airbus can be characterized as a duopoly, with a total market share of 91%. Therefore, we believe the comparison between Airbus and Boeing would bring the most accurate view of Boeing's performance and evaluation in the market.

EXHIBIT 15

Company Name			Boeing				
			2020	2019	2018	2017	2016
Market Data	Price	*($/share)*	214	326	323	295	156
	Market Cap	*($M)*	120,840	183,370	183,060	175,640	96,080
	EV	*($M)*	156,190	200,730	181,630	176,860	98,040
Financial Data	Sales	*($M)*	58,158	76,559	101,127	94,005	93,496
	EBITDA	*($M)*	-10,478	358	14,170	12,461	8,475
	EBIT	*($M)*	-12,724	-1,913	12,056	10,414	6,586
	Earnings	*($M)*	-5,642	4,528	19,706	17,463	14,529
Valuation	EV/Sales	*x*	2.7x	2.6x	1.8x	1.9x	1.0x
	EV/EBITDA	x	-14.9x	560.7x	12.8x	14.2x	11.6x
	EV/EBIT	x	-12.3x	-104.9x	15.1x	17.0x	14.9x
	P/E	x	-21.4x	40.5x	9.3x	10.1x	6.6x

Company Name			Airbus				
			2020	2019	2018	2017	2016
Market Data	Price	*($/share)*	90	130	84	83	63
	Market Cap	*($M)*	86,540	114,340	74,500	76,720	51,310
	EV	*($M)*	89,880	117,260	74,340	79,780	52,590
Financial Data	Sales	*($M)*	57,014	78,935	75,238	75,467	73,679
	EBITDA	*($M)*	3,992	4,423	6,589	5,266	2,064
	EBIT	*($M)*	758	1,145	3,702	2,669	-475
	Earnings	*($M)*	6,468	11,766	10,377	8,598	5,825
Valuation	EV/Sales	*x*	1.6x	1.5x	1.0x	1.1x	0.7x
	EV/EBITDA	x	22.5x	26.5x	11.3x	15.2x	25.5x
	EV/EBIT	x	118.6x	102.4x	20.1x	29.9x	-110.7x
	P/E	x	13.4x	9.7x	7.2x	8.9x	8.8x

EXHIBIT 16



As presented by the graph, Boeing's EV/Sales multiple has remained higher (approximately 0.7 times) than that of Airbus over the 5-year-period. This trend indicates that Boeing is much more expensive than Airbus, and it might be less attractive to investors. However, it is unwise to conclude that Boeing is overvalued based solely on the EV/Sales ratios comparison of two competitors in the market. Furthermore, the ratio isn't reflective enough as it doesn't consider the company's profitability and cash flow generation. According to our analysis above, we believe that Boeing has a potential growth rate and can generate significantly higher sales in the future, and provides investors with attractive returns.

EXHIBIT 17

In the period from 2016 to 2018, Boeing had lower or comparable EV/EBITDA multiples compared with Airbus, indicating that Boeing might be undervalued. In the past two years, both companies suffered from the Covid-19 pandemic. The plummet in the EBITDA of Boeing, which was negative in 2020 and minimal in 2019, and high EVs made the EV/EBITDA ratios of the company unrealistic. Therefore, it isn't meaningful to use multiples in these two years to make comparisons of the two firms.

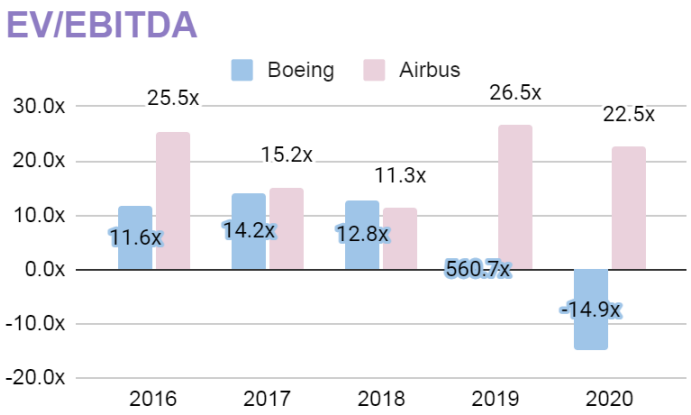
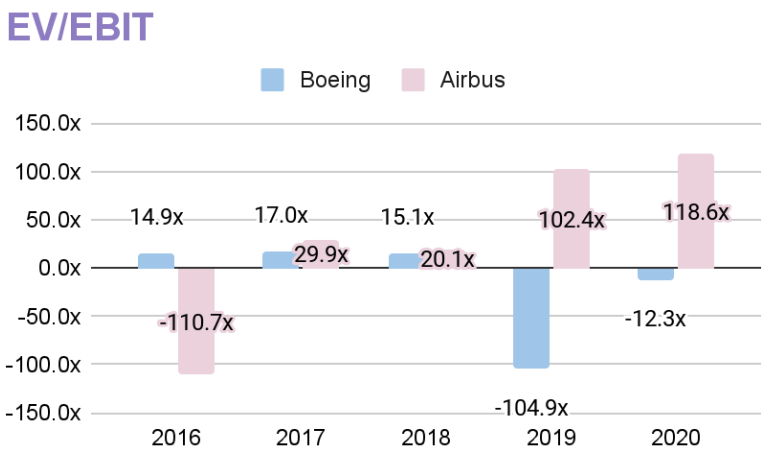
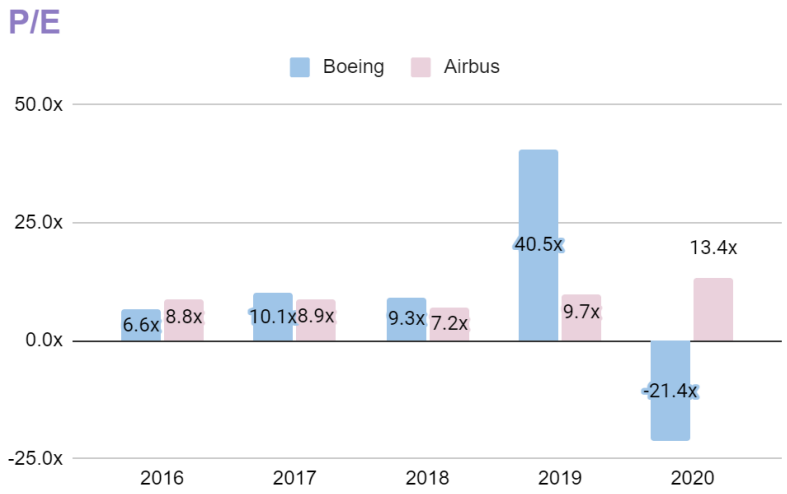


EXHIBIT 18



With similar philosophy, we can see that the ratios of Boeing were negative in 2019 and 2020, while the ratio of Airbus was negative in 2016. Consequently, we should not take into consideration these multiples. The figures in 2017 and 2018 showed that Boeing had lower EV/EBIT ratios than that of Airbus, which might signal that Boeing was undervalued.

EXHIBIT 19



Not taking into account the two years 2019 and 2020, the P/E ratios of the two companies are relatively equivalent. In 2016 Boeing's multiple was lower than its counterpart while the reverse was true for 2017 and 2018. However, the differences between multiples were negligible, so it is hard to conclude whether Boeing was overvalued based on P/E ratios solely.

In conclusion, Figures from 2019 and 2020 were not reflective and should be ignored. Companies were generally affected by the Covid-19 pandemic, and Boeing was specifically affected by 737 Max incidents. Therefore, the reports from 2016 to 2018 are more reflective and closer to the normal-state operation of Boeing, which is comparable to Boeing's operation state in the near future, than the past two years. In addition, the comparison of only two companies in the market cannot reflect the state of the market correctly. What we can conclude from these comparisons is whether a company is undervalued relative to the other one, but not the whole industry. In this case, Boeing was undervalued relative to Airbus, which was also its most direct competitor. Moreover, we believe Boeing should be trading at a premium over Airbus with all the potentials analyzed in previous sections, including lesser risk in revenue diversification and better R&D expenditure.

III. STOCK VALUATION

Boeing witnessed the stock losing 75% of its value early in the year but rallying partway back in the final months. Boeing's gross orders in 2018 were 1090 while in 2019, the figure dropped to 246. At the same time, Airbus received 1131 gross orders. In 2020, Boeing only had 184 gross orders. The total revenues of Boeing dropped by 42.4% from 2018 to 2020. As a result, BA's stock suffered a disaster in 2019-2020, when its stock price reached a record low.

In 2021, with the Covid-19 vaccines and the recertification of 737 MAX, its share price should grow significantly. We estimate the target share price of Boeing by two methods: The discounted cash flow analysis and the comparable company analysis - giving the results of $300 and $291 per share respectively. **The final target price we would suggest is $296 per share.** Boeing's closing share price on August 17 2021 was $222, implying a 25% potential return.

1. **Comparable Company Analysis:**

EXHIBIT 20

Comparable analysis	EV (Aug 17) *($M)*	EV/2022 EBITDA	EV* *($M)*
Boeing	172,470	20.58x	226,824
Airbus	97,460	27.07x	

The data taken on August 17 showed that the Enterprise Value of Boeing was $172.47 billion, while the EV of Airbus was $97.46 billion. The EV/2022 EBITDA multiples of Boeing and Airbus are 20.58 and 27.07 respectively. Airbus (Boeing's largest rival) is more dependent on civilian aircraft to earn its revenues. Commercial and helicopters segments together account for more than 80% of its revenues, whereas Boeing earns just 60% from the commercial aircraft category. In addition, civilian helicopters are not in Boeing's product portfolio. Although Airbus has a 37.5% stake in European missile developer and manufacturer MBDA, it doesn't offer Missile systems; whereas, Boeing does. This offering further proves Boeing's competitive edge in the ballistic missiles space as MBDA doesn't produce them. With all of the analysis above and in the previous section, we believe Boeing is being traded at a discount. Therefore, Boeing should be traded at least on par with Airbus, which means at an EV/EBITDA ratio of 27.07x. The estimated EV of Boeing should be $226.824 billion. We then yield a target price of $291.

EXHIBIT 21	Boeing
EV *($M)*	**226,824**
Net debt = Debt - Cash *($M)*	55,222
Market cap = EV - Debt *($M)*	171,602
Share price	**291**

2. **Discounted Cash Flow Analysis:**

For our discount cash flow analysis, we calculate the free cash flows of Boeing from 2021 to 2025, using the estimations and projections of earnings, capital expenditures, depreciation & amortization, and changes in net working capital. The 8% weighted average cost of capital is calculated based on the assumption of a cost of equity of 10%. We use the 2025 free cash flow for our terminal value, working at the terminal growth rate of 5%. Our analysis yields an enterprise value of $232.761B and a target share price of $301.

EXHIBIT 22

Discounted cash flow analysis	2017	2018	2019	2020	2021*	2022*	2023*	2024*	2025*
Net (loss)/earnings	8,458	10,460	(636)	(11,941)	(4,568)	3,508	4,719	6,601	7,422
CapEx	1,870	1,791	1,961	1,303	1,319	1,554	1,722	1,894	2,083
CapEx as a % of revenue	1.99%	1.77%	2.56%	2.24%	2.00%	2.00%	2.00%	2.00%	2.00%
D&A	2047	2114	2271	2246	1649	1943	2153	2368	2604
D&A as a % of revenue	2.18%	2.09%	2.97%	3.86%	2.5%	2.5%	2.5%	2.5%	2.5%
Change in NWC		3,432	9,525	5,298	(23,513)	2,211	2,540	5,350	1,067
Free Cash Flow = Earnings + D&A + Change in NWC- Capex	8,635	14,215	9,199	(5,700)	(27,752)	6,107	7,690	12,425	9,010
WACC	8%								
PV of FCF					(27,752)	5,655	6,593	9,863	6,622
Sum of PV of FCF	981								
Terminal growth rate	5%								
Terminal value	315,335								
PV of Terminal value	231,780								
EV	232,761								
Net Debt	55,222								
Market Cap	177,539								
Share price	**301**								

APPENDIX: Forecast assumption

EXHIBIT 23

Appendix	2017	2018	2019	2020	2021*	2022*	2023*	2024*	2025*
Revenue growth (% yoy) - BCA	n/a	4.66%	-46.87%	-49.89%	33%	35%	15%	10%	5%
Revenue growth (% yoy) - BDS	n/a	12.81%	12.50%	0.62%	12%	12%	10%	10%	10%
Revenue growth (% yoy) - BGS	n/a	16.71%	8.52%	-15.84%	-3%	5%	5%	10%	20%
Revenue growth (% yoy) - BAR	n/a	-76.56%	-230.15%	-175.68%	0%	0%	0%	0%	0%
COGS as a % of revenue	81.50%	80.58%	94.17%	109.78%	96%	82%	82%	81%	81%
G&A as a % of revenue	4.36%	4.52%	5.11%	8.28%	7%	6%	5%	5%	5%
RD as a % of revenue	3.38%	3.23%	4.20%	4.26%	3%	4%	4%	3%	3%
Tax rate	16.32%	9.86%	71.85%	17.51%	21%	21%	21%	21%	21%
Long-Term Debt	9,782	10,657	20,940	62,974	57025	57025	57025	57025	57025
Interest rate	3.68%	4.46%	3.45%	3.42%	4%	4%	4%	4%	4%
AR as a % of revenue	12.12%	14.20%	16.29%	17.28%	15%	15%	14%	14%	12%
Inventories as a % of COGS	80.13%	76.78%	106.28%	127.99%	90%	90%	85%	85%	80%
AP as a % of COGS	15.93%	15.85%	21.57%	20.25%	18%	18%	17%	17%	16%
NWC	60,583	64,015	73,540	78,838	55,325	57,536	60,076	65,426	66,492

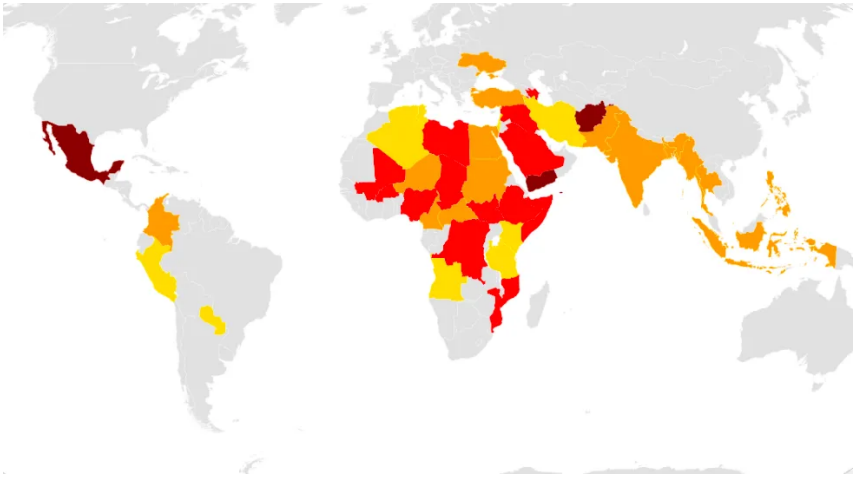
Geopolitical risks:

U.S-China trade tensions

The trade relations between the U.S and China are worsening. China is delaying the recertification of the 737 MAX. According to the "Made in China 2025" strategy, the country may rely solely on narrow-body jets made by its own aircraft manufacturer (Comac). [51] China is the largest market for aircraft purchases. However, since only 1% of Boeing's orders since 2017 have come from China, Boeing has limited exposure to this risk.

Danger areas and no-fly zones

Wars and conflicts affect several countries in strategic flying zones. As the downing of flight MH17 over Ukraine in 2014 has shown, situations on the ground can have disastrous effects on airspace in proximity of 30,000 feet.[52] Altitude cannot guarantee safety. Most of the wars are in the Middle East, North West Asia, and Sub-Saharan Africa.[53] Such geopolitical disturbances may badly impact aerospace security.



Map of conflicts in the world today.[54]

Social risks:

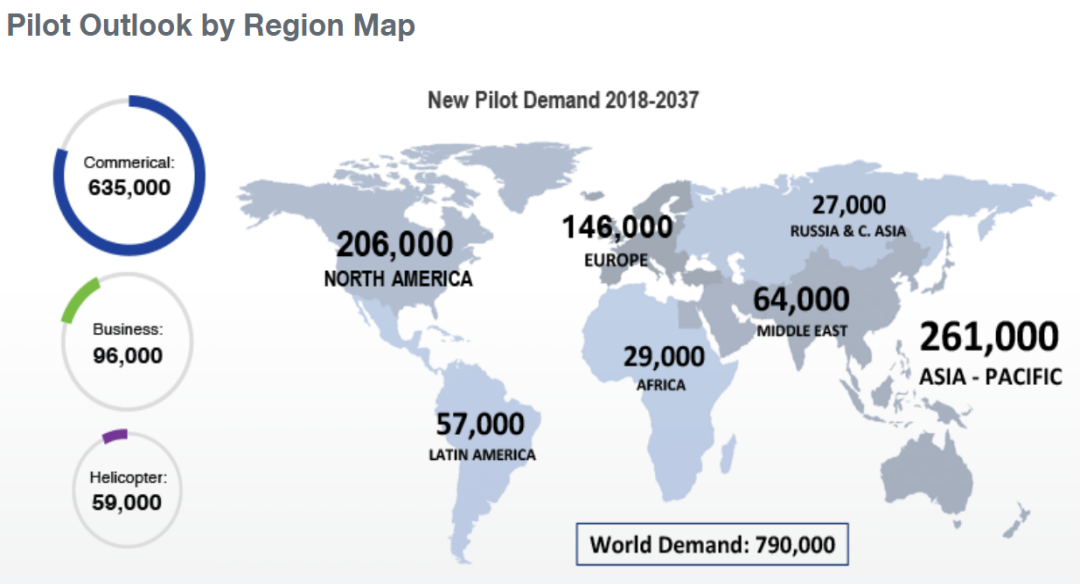
Environmental liabilities

Boeing is subject to various U.S. federal, state, local and non-U.S. laws and regulations related to environmental protection, including the discharge, storage, and remediation of hazardous substances and wastes. Boeing needs to have a complete awareness of the regulatory environment because non-compliance could result in grounded flights and attendant cost repercussions.

Cybersecurity

Boeing faces great difficulty in protecting its and its customers' information. The primary problem is threats to the confidentiality, availability, and integrity of its data and systems. Although Boeing maintains extensive security control systems, cyber-attacks may result in losses of confidentiality and a bad reputation.

Pilot shortages



(Source: Boeing)

In 2018, prior to COVID-19, Boeing already experienced pilot shortages. Now, due to the pandemic, the situation is getting worse. In North America, many experienced pilots take early retirement. CNN Business expected that by 2025 when the demand for traveling is high, there would be a shortfall of 34,000 commercial pilots, which could limit the growth of airlines and consequently Boeing, decrease flights and lead to the closure of some regional airlines. [55]

Economic risks

1. Factors that may impact top line

Global trade risks

Boeing derives a significant portion of its revenue from non-US sales, hence the high exposure to international business risks, including:

- changes in regulations and disputes with authorities in non-US jurisdictions that can affect the sales and delivery process, or impose additional costs on customers which are attributable to the importation of Boeing's products and services.
- fluctuations in international currency exchange rates.
- the difficulties of non-US customers in purchasing through international banking systems.
- imposition of both domestic and international taxes, export controls, sanctions, and other trading restrictions.

Changes in levels of the government's investment

83% of Boeing's revenue is derived from US government funding for defense-related programs with the US Department of Defense (from our company analysis). Changes in investment priorities (related to the authorizations and appropriations) can result in reductions, cancellations, and delays of running/future contracts. They can have a material impact on the operations and Boeing's financial state.

Overlooking the benefits of mergers and joint ventures

Failure to notice the anticipated benefits of mergers, acquisitions, joint ventures, or divestitures may expose the company to adverse impacts such as unpredicted performance issues, legacy liabilities, transaction-related charges, miscalculations in reported results of operations, and additional payment obligations.

COVID-19 and the 737 MAX grounding

- Deterioration in major airlines' financial stability during COVID-19 can result in an increasing number of order cancellations and fewer new orders for aircraft/services.
- The two 737 MAX crashes and its grounding resulted in many canceled orders and may imply fewer new orders for its single-aisle jets like the 737 MAX, where Airbus is the leader. [56]

2. Factors that may impact input costs

Changes in estimated costs

- Since contracts for commercial aircraft are often signed 2 years prior to the delivery date, changes in pricing due to escalation amounts in such a period of time may affect the company's calculated revenues.
- New and current-operating aircraft programs: Due to the size and nature of manufacturing and testing procedures, the final estimation of total revenues and cost is heavily subject to variables such as increased wages and workers' benefits packages, fuel price fluctuations, delays/defects in supplying components, and evolving standards for commercial airplane certification.

Heavy dependence on subcontractors and suppliers

If one or more of Boeing's subcontractors are faced with financial mismanagement, delivery delays, or raw material shortage (or only available at a high price), BA may risk belated delivery out of budgeted cost, failing commitments to customers, and incurring additional expenses.

Operational issues

Due to COVID-19, Boeing faces great challenges in operations, including site shutdowns and workplace disruptions. In the future, the situation of COVID-19 may further disrupt its operations and financial performance. The suspension of operations may result in adverse effects on the business and cash flows.

aerospace & defense technology

Current trends

	CO2 emission	capacity	max speed
Boeing 747	92 kg/hr	345	613 mph
Zero-emision flights – ZeroE	0 kg/hr		
Supersonic flights – Concorde		100	1350 mph

Internet of Things (IoT)

Structural Health Monitoring

data

embedded/attached non-destructive evaluation sensors

preventive maintenance

monitor significantly large areas of structures including fiber optics, active ultrasonics, and passive acoustic emission

Artificial Intelligence

standard commercial flight
fuel consumption

14,400 liters per hour

with the aid of AI
↓5.41%
fuel consumption

aerospace training
provide pilots with realistic simulation experiences with the aid of AI-enabled simulators and virtual reality systems

smart maintenance
AI models can be trained to analyze collected data and identify malfunctions in the components of the aircraft

3D Printing
a single component

↓2.1% air drag
↓5.41% fuel costs
↓20% production costs

Future prospects

Efficient fuel consumption

climate impact compared to jet fuel

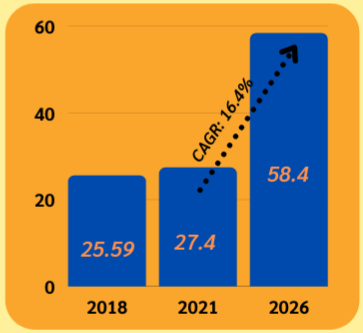
Hydrogen combustion	Fuel-cell technology
↓50-75%	↓75-90%

Better cybersecurity

IoT | Biometrics | E-operation

Unmanned Aerial Vehicles (UAV)

Global UAV market size (USD billion)



Urban Air Mobility

urban transportation systems that move people by air

Air Taxis (eVTOL application)


CityAirbus


Airspeeder

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