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Equity Research

Turbulence easing after strong crosswinds

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Abstract

The following Equity Research Report delves into a comprehensive analysis of The Boeing Company, a leading Aerospace & Defense firm based in the United States. The main objective of this paper is to develop a valuation of Boeing's intrinsic value, culminating in an investment recommendation regarding its stock price. Employing qualitative and quantitative instruments, we aimed at understanding the company's future business performance. Relying on the Discounted Cash Flow method, we reached to a target share price of \$313 as of December 31st of 2024, which corresponds to a Buy recommendation.

Keywords: Boeing, Aerospace & Defense, Valuation

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This report is part of the Equity Research report “Turbulence easing after crosswinds”, developed by Diogo Viana (53892) and Diogo Sá (52834) and should be read as an integral part of it.

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Introduction

The objective of the joint report “Turbulence easing after crosswinds” is to conduct an extensive analysis of The Boeing Company, covering the past, current, and future outlook of the Aerospace & Defense manufacturer. The goal is to provide an investment recommendation regarding Boeing’s stock price. This assessment consists of two methodologies, a qualitative and a quantitative one, that are now delineated into two parts. In part one, which is the part presented in this individual report, we focused on understanding how the company and the market have evolved up until this point regarding the financial and management performances. For that purpose, we analysed Boeing’s four business units from a holistic perspective, first looking at the company itself, and then evaluating the dynamics of the general industry across different geographies. In part two, we approached the company in a forward-looking way, forecasting key performance indicators. Concluding this equity research, we performed a valuation using Discounted Cash Flows, Multiples, and a Sensitivity analysis to assess Boeing’s implicit stock price.

Company Overview

Boeing Commercial Airlines (BCA)

This segment encapsulates Boeing's commercial aviation business unit, focused on the development and manufacturing of both narrow-body and wide-body commercial jet aircraft, primarily serving the airline industry. Additionally, it extends its reach into the private market through the production of business jets. The segment includes five aircraft models – 737, 747, 767, 777, and 787 – with the 737 being the flagship product, constituting 80% of the 480 deliveries in 2022. Across the Atlantic, Airbus emerges as Boeing's primary competitor in the commercial aviation division, having delivered 661 units in the same year.

Boeing's commercial aircraft business represents a significant operational segment, contributing 39% to the total revenue generated in 2022, equaling \$25.9Bn. Despite substantial revenue, the segment has reported consistently negative earnings from operations since 2019, with a 2022 loss of \$2.4Bn and a negative operating margin of 9.2%. In contrast, its European counterpart Airbus achieved a positive 9.0% operating margin, driven by €41.4Bn in revenue, surpassing Boeing. The performance disparity is attributed to Airbus' higher deliveries and an improved order book during this period, accumulating 2,363 compared to Boeing's 695 since the grounding of the 737. Boeing showed improvements in operating margins in the segment in 2022 (transitioned from -33% to -9%) driven by factors such as the absence of the \$3.5Bn reach-forward loss related to the 787-program in 2021, increased 737 deliveries, and lower production costs. However, these gains were partially offset by higher R&D expenses. Additionally, the company faced charges equivalent to \$212Mn related to the Russia-Ukraine conflict due to the interruption of services to Russian clients.¹

Airlines curate their fleet composition considering multiple factors such as long-term corporate strategy and specific route networks. Another important aspect is the impact of national governments favoring domestic entities over foreign manufacturers through political pressure. Illustrative examples include the German airline Lufthansa and the British International Airlines Group (IAG), relying predominantly on European aircraft producers for their fleets (79% and 72% of their fleets, respectively). In contrast, American carriers like Southwest Airlines and United Airlines exhibit preference for American-manufactured aircraft, with reliance rates of 100% and 81%, respectively.²

United States

The United States (U.S.) accounted for 48% of BCA revenues from 2020 to 2022, making it the segment's primary revenue stream. This presence implies the U.S. is Boeing's "home protected" market, where the company's aircraft constitute 63% of the total fleet that the industry delivered to North America. Despite facing global challenges such as the 737 Max groundings in 2019 and the COVID-19 pandemic in 2020 that impacted financial results across regions, the U.S. segment has been the fastest to rebound from this downturn. It not only recovered 79% of 2018's revenue levels but also outpaced the non-U.S. segment, which achieved a 32% recovery relative to the same year. This resurgence was buoyed by the revitalization of the commercial market and the return to service of the 737 Max. Airplane deliveries in 2022 have already surpassed 2018's levels, with available quarterly data for

Exhibit 1: Historical BCA Revenue (\$Bn)
Source: Boeing Annual Report

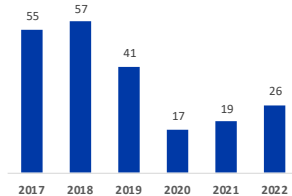
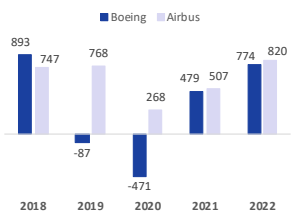


Exhibit 2: Historical Boeing's and Airbus' net orders
Source: Boeing and Airbus Annual Report

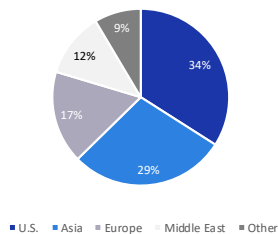


2023 indicating a trajectory towards achieving the most prolific delivery year within the examined historical period. This positive trend is expected to persist despite the discovery in August of a manufacturing defect on the 737 Max.³

Non-U.S.

Asia emerges as a focal point for BCA within the non-U.S. geography, serving as its largest contributor in 2022. Historically, it held the position of the world's largest market before the crises of 2019 and 2020. In 2022, Asia contributed 33% to the non-U.S. revenues of \$13.6Bn. However, recovery has stalled in Asia, operating at just 21% of pre-crisis revenue levels. This deceleration is due to China's extension of 737 Max grounding restrictions beyond the timeline enacted by the rest of the world. As Boeing only managed to deliver 8 units to China in 2022, Airbus, in contrast, sold more than 100 during the same period. This underscores the greater foothold Airbus managed to achieve in the country after Boeing's historical missteps.⁴ Nonetheless, there are indications that China is considering the resumption of purchases of the 737 Max by the beginning of 2024.⁵

Exhibit 3: BCA Revenue distribution by geography (2017-2022)
Source: Boeing Annual Report

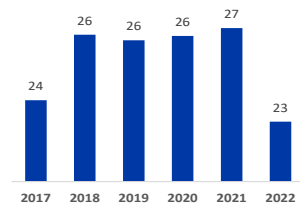


Both Europe and the Middle East are important regions for Boeing, consistently contributing approximately 17% and 12%, respectively, to BCA's total revenue over the past six years. Within the European region, some of Boeing's main clients include Ryanair and Air France-KLM, possessing 299 and 288 Boeing airplanes, representing 100% and 54% of their respective fleets.⁶ In general terms, Airbus is ahead of Boeing in the European market, securing 48% of total aircraft deliveries in the region in 2022, compared to Boeing's 27% share.

Boeing Defense, Space & Security (BDS)

BDS is Boeing's second-largest business unit, representing 35% of total revenues in 2022, and ranks as the world's fifth-largest defense contractor.⁷ The unit engages in the research, development, and production of military aircraft and weapons systems. Moreover, Boeing offers a range of human space flight and launch systems, including orbital satellites. The segment's primary client is the United States government, namely the United States Department of Defense (DoD) and NASA, accounting for 66% of total segment revenue in 2022. In the same year, the company decided to streamline the segment's internal divisions from eight to four in response to lackluster performance, which had culminated in a 13% YoY revenue decline for the year 2022 to \$23.2Bn.

Exhibit 4: Historical BDS Revenue (\$Bn)
Source: Boeing Annual Report



Until 2021, the division had reported positive earnings from operations. However, in both 2022 and available 2023 quarterly data, BDS has reported negative earnings, attributed to charges in development programs, such as the Starliner astronaut spacecraft. These programs are fixed-price government contracts and have experienced major design and cost overruns. During the 2Q23 earnings call, CFO Brian West indicated limited profitability expectations for the BDS segment in the near term, as these problems are not anticipated to be resolved promptly.

Boeing's BDS presence faces significant competition from multiple manufacturers, particularly in the domestic market. Among them, Raytheon Technologies and Lockheed Martin stand out as the largest defense providers, having recorded revenues of \$67Bn and \$66Bn in 2022, corresponding to an increment of 185% and 190% relative to Boeing,

respectively. While Europe hosts a few defense players, such as Airbus or Thales, 63% of the EU's defense budget is allocated to U.S. players. This is mainly due to the U.S. Foreign Military Sales (FMS) scheme, enabling foreign governments to engage directly with the Pentagon, bypassing traditional defense contractors and expediting the procurement of defense equipment. The absence of an equivalent program in Europe puts local players at a distinct disadvantage.⁸

Boeing Global Services (BGS)

Boeing Global Services delivers to its customers – both commercial and governmental – a full spectrum of solutions based on fleet availability and mission-readiness. This segment focuses on supply chain and logistics management, maintenance, repair, overhaul (MRO), pilot and maintenance training systems, as well as digital solutions and data analytics.⁹ One of BGS's key differentiators is Jeppesen, a technological company acquired in 2000 by Boeing, which offers a range of navigation information and flight planning solutions. Jeppesen's navigation charts, commonly referred to as "Jeps" are used by nearly 80% of pilots across 400 airlines worldwide, irrespective of the aircraft type they operate.¹⁰

Boeing expanded its presence in both Europe and Asia by establishing distribution centers in Germany and Poland, as well as the adoption by the Japan Airlines of the Boeing Insight Accelerator program. Over the past three years, Boeing Global Services has kept a steady share of the company's revenues at 26%, indicating that the segment has been growing at the same pace as Boeing. The increment of \$1,283M from 2021 to 2022 is mainly attributed to higher commercial services volume and is in part offset by decreased government services volume. Unlike the two main business units, BGS' earnings from operations have been positive and gradually increasing. In the aftermath of the COVID-19 pandemic, the segment experienced a significant recovery of its operating margin, growing from 2.9% in 2020 to 15.5% in 2022.

Boeing Capital Corporation (BCC)

Boeing Capital Corporation operates a fully owned subsidiary, serving as the financing arm of the aircraft manufacturer. This segment plays a global role in offering a wide range of optimal financing solutions to the company's customers. It supports the remaining business units by arranging, structuring, and providing asset-based financing and leasing to assist in the sale and delivery of Boeing products and services worldwide. Boeing's delivery funding includes financial instruments such as export credit, bank debt, capital markets, and sale leaseback. In the recent past, the segment's revenues experienced a downtrend as BCC lowered gains from the re-leasing of assets. Earnings from operations were also greatly affected by receivable losses from the Russia-Ukraine war, with operating margins falling from 39% in 2021 to less than half (15%) in 2022. Although customer financing provided in 2022 equaled \$96Mn, marking a significant increase compared to 2021, where no new customer financing was provided, the total customer financing and investment portfolio decreased 13% mainly due to portfolio run-off.

Amidst an economic environment of high interest rates, the aviation industry's delivery funding landscape has been reflecting the de-leveraging efforts made by airlines. As such,

Exhibit 5: Historical BGS Revenue (\$Bn)
Source: Boeing Annual Report

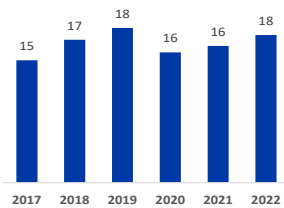
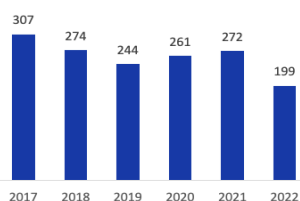


Exhibit 6: Historical BCC Revenue (\$Mn)
Source: Boeing Annual Report



airlines are increasingly opting for cash as a source of capital for aircraft acquisitions rather than tapping into available credit facilities. For the American manufacturer, the proportion of clients using cash as a funding source has increased from 24% in 2018 to 54% in 2022. In the same line, the recourse to sale leaseback arrangements has emerged as a favourable funding alternative. Oppositely, bank debt, which held the leading position as a funding source in 2018, declined and currently ranks as the third most important source in 2022. This descent is attributed to escalating financing costs triggered by the surge in interest rates.

In early 2023, the company integrated BCC into the commercial airlines segment to streamline its corporate structure.

Shareholder Structure

The Boeing Company began trading on the New York Stock Exchange (NYSE) on January 2, 1962, following an initial public offering (IPO). In terms of leadership, the company's operations are monitored by David L. Calhoun, who has assumed the role of CEO in 2020 after the removal of his predecessor, Dennis Muilenburg. Muilenburg's departure was prompted by the aftermath of the 737 Max crises and subsequent challenges in stabilizing the company.

Boeing's ownership structure is predominantly shaped by institutional investors, who hold a majority stake at 51%, with The Vanguard Group, Newport Trust Company, and BlackRock, Inc., emerging as the top-three equity holders. The remaining 49% are in the power of retail investors. Put in absolute terms, as of January 20, 2023, the aircraft manufacturer had 88,322 shareholders on record.¹¹ This shareholder structure reflects a more disperse range of investors compared to the consortium model of Airbus. In the European manufacturer's case, 26% of the ownership is detained by a Shareholder's Agreement between the French, German, and Spanish governments, with each holding 11%, 11%, and 4%, respectively. The remaining outstanding shares of Airbus are free float (74%).

The Sector

Boeing Commercial Airplanes

Economic Overview

The financial performance of the commercial aviation sector is directly tied to long-term trends in the aviation industry, particularly the relationship between Revenue Passenger Kilometer (RPK), representing the total distance covered by paying passengers, and Gross Domestic Product (GDP). As shown in Exhibit 8, a strong positive correlation emerges between these variables. This correlation is rooted in economic growth, which not only increases disposable income but also propels citizens from low to middle income, fostering an increased propensity to spend on air travel. Ultimately, such an escalation in demand requires additional aircraft to be made available to match the market's needs. In the first quarter of 2023, RPKs managed to recover to 88% of pre-pandemic levels. Nevertheless, recovery was felt differently throughout the regions. Whereas Europe, Latin America and the Middle East managed to regain their competitive positions, international flights involving the

Exhibit 7: Boeing Shareholder Structure (\$Bn)
Source: Boeing Annual Report

Top-3 Shareholders	Share
The Vanguard Group	7.7%
Newport Trust Company	7.4%
BlackRock, Inc.	5.6%

Exhibit 8: Historical RPK vs. Real GDP (%)
Source: IATA

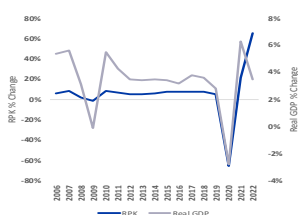
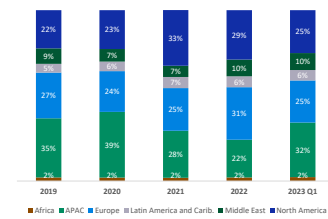


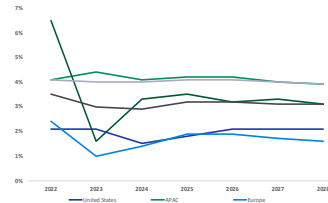
Exhibit 9: Regional share in global RPKs
Source: IATA



Asia-Pacific region had been the slowest segment to recover from the shock until 2022, mainly due to China’s long lockdown period. However, given the normalization of activity, the Asia-Pacific region has recouped its position as the leading region of the world’s RPKs.¹²

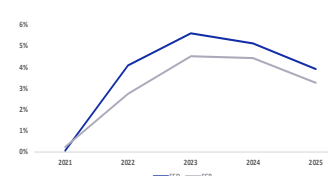
Regarding the future, IATA projects the demand for air travel to double by 2040, growing at an average annual rate of 3.4%. The Asia-Pacific region is expected to be the main contributor towards this growth, adding 2,554 million passengers, which corresponds to a 4.6% CAGR from 2019 to 2040. The reasons underlying this forecast are the promising demographics and growth in household earnings, which fall in line with reports by the U.S. Office of National Intelligence, estimating most of global population growth for the next two decades to come from South Asia and Sub-Saharan Africa,¹² and by S&P Global that expects APAC to go from 37% to 42% of the world’s GDP by 2040.¹³ More specifically, middle-class households in emerging markets are forecasted to grow by 90% through 2042.¹⁴ On the lower end of the spectrum, Europe will be the lowest growing region at 2.1% CAGR in the same period.¹⁵

Exhibit 10: Forecasted Global GDP Growth
Source: IMF



Another key factor posing volatility to such industries is the instability in oil prices due to embargos following international conflicts such as the one between Ukraine and Russia, which directly impacts operational costs for airlines. This factor’s influence is underscored by the fact that fuel costs represent 30% of total expenses incurred by airlines.¹⁶ Exhibit 10 demonstrates that there is a quasi-perfect negative correlation of 0.96 between jet kerosene prices and the net profit margins of global commercial airlines from 2010 and 2019. Although there are other variables influencing net profitability, this significant negative correlation suggests that, during this period, air travel operators absorbed the additional cost of rising fuel prices rather than passing it through to clients. Due to the additional pressure on earnings, airlines are incentivized to anticipate the replacement of outdated and less fuel-efficient aircraft with more technologically advanced alternatives. However, the dynamics of this relationship inverted between 2020 and 2022. During this period, despite a substantial increase of 191% in jet kerosene prices, net profit margins also rose 97%. This shift can be mainly attributed to the resurgence of demand post-COVID-19, as evidenced by the RPK increase of 101% in the same period. Looking ahead, BMI, a subsidiary of Fitch Solutions, forecasts global average jet fuel to be priced at \$110 per barrel in 2023, gradually easing to \$104.3 per barrel by 2027.¹⁷ Underlying this forecast is an implicit expected phase out of the temporary demand spike from 2023’s summer travel season, which had rebounded from pre-pandemic levels, driving down jet fuel prices in the future and increasing operating margins if the negative correlation is restored.

Exhibit 11: Historical Jet kerosene Price vs. Net Profit Margin
Source: IATA



After a prolonged period characterized by persistently low interest rates, the U.S. Federal Reserve and the European Central Bank opted to raise interest rates in response to mounting inflationary pressures. Looking into the future, both institutions foresee a near-term reduction in interest rates, aligning with their projections of lower inflation rates – 3.9% and 3.3%, respectively – by the year 2025.¹⁸ The monetary tightening developments by most central banks in the world have the potential to drive down financing capabilities in the short-term for Boeing’s clients to finance their own operations or invest in new projects, such as in the acquisition of new aircraft, thereby limiting additional orders. Despite the recent surges in inflation, manufacturers do not pass the entirety of the costs to clients. In most contractual

Exhibit 12: Interest Rates: FED vs. ECB
Source: FED; ECB



agreements, there is typically a “hyper-escalation” clause, where both parties are partially protected against rises in costs, agreeing to share the incremental costs.¹⁹

Market Demand

As of the latest IATA growth projections, air travel demand is anticipated to experience differentiated growth across the various regions until 2040 (see Exhibit 13). In alignment with these projections, we estimate the total fleet must expand by the same growth rates to accommodate demand. Considering the current fleet size equals 21,891 airplanes, we anticipate the total fleet to rise by 8,456 units until 2033. Most of the market deliveries from Boeing and Airbus in 2022 consisted of narrow-body airplanes (84%). We expect this trend to continue for the deliveries of new aircraft in the forecasted period, except for the Middle Eastern region which has historically privileged wide-body jets. As we will detail in the next sections, newer narrow-body airplanes not only surpass their preceding generations’ abilities with their latest technological improvements, but also present notable advantages relative to wide-body counterparts. These advancements include a 50% range improvement over the previous generations, while being able to cover 75% of transatlantic flights, a range previously exclusive to wide-body jets.²⁰ In total, narrow-body jets will account for 6,703 deliveries destined to fleet growth while widebody airplanes will account for 1,753 deliveries until 2033.

Furthermore, examining retirement dynamics is a critical point to assess overall fleet deliveries in the future. Considering the current fleet size and the fact that the average aircraft retirement is typically of 23.6 years²¹, the forecasted total replacement deliveries amount to 9,276. The APAC region will replace the greatest number of jets given that it currently possesses 37% of the total worldwide fleet.

In total, the cumulative market demand for the forecasted period is projected to be of 17,732 airplanes. A slight fleet recompositing effect is expected given that while 75% of the total fleet in 2023 was composed of narrowbodies and 25% of wide-bodies, by 2033 we project narrow-bodies to grow to 76% of the total fleet.

Competitive Landscape

Once we understand the needs of the market during the period in analysis, it is fundamental to assess if the Aerospace industry has the capacity to supply those aircraft and therefore fulfill the demand. Boeing and Airbus stand out as the primary players in the aircraft manufacturing market, competing for dominance across a broad spectrum of airplane types. Boeing’s unique narrow-body product is the 737 jet along with its variations, which have not achieved the same success in number of orders relative to its competitor. Airbus has successfully developed a family of narrow-body jets, the most famous of which being the A320 and its variations. Overall, as of December 2023, Boeing had 4,590 unfilled orders for its narrow-body model, registering its record in 2018 with 5,694 aircraft orders²², whereas its competitor had 7,296 in backlog and surpassed 8,000 total orders for the first time²³. In this type, Airbus’ A319neo can be compared to the B737-MAX 7, as both are destined for short to medium-haul routes, and if we consider the range, capacity, and efficiency factors, the American aircraft comes up as the better option. Longer-range narrow-body jets have been increasingly pressuring the wide-body segment, such as the Airbus A321neoLR or the

Exhibit 13: Passenger Traffic Growth (2019-2040, CAGR)
Source: IATA

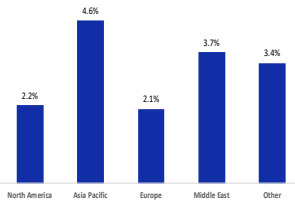


Exhibit 14: Aircraft Demand Forecast
Source: Own Analysis

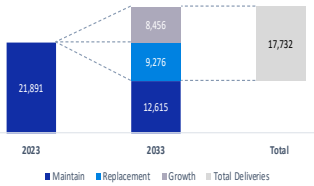


Exhibit 15: B737 Max 7 vs. A319neo
Source: Boeing, Airbus

	B737 Max 7	A319neo
Range (km)	7,130	6,950
Maximum Passenger Capacity	172	160
Fuel Capacity (liters)	25,800	29,659
Cargo Capacity (m3)	32	27

Exhibit 16: B737 Max vs. A321
Source: Boeing, Airbus

	Boeing 737 Max 10	A321neo
Range (km)	6,112	7,400
Maximum Passenger Capacity	230	244
Fuel Capacity (liters)	25,800	32,853
Cargo Capacity (m3)	56	51

Exhibit 17: A321XLR
Source: Airbus

	No Competitor	A321XLR
Range (km)	-	8,700
Maximum Passenger Capacity	-	220
Fuel Capacity (liters)	-	32,940

Exhibit 18: B737 Max 9 vs. A320neo
Source: Boeing, Airbus

	B737 Max 9	A320neo
Range (km)	6,570	6,500
Maximum Passenger Capacity	220	195
Fuel Capacity (liters)	25,800	32,853
Cargo Capacity (m3)	51	37

Boeing 737 Max, which have lower unitary costs compared to wide-body jets due to their smaller size and a better ability to be redeployed to alternative routes in low-season periods. When we compare the A321neo to the 737 Max 10, which is the closest equivalent in passenger capacity terms, we find that the A321neo takes the lead given that it not only 6% has more passenger capacity but is also able of achieving a range of 21% higher than its Boeing counterpart.

The coming launch of the Airbus A321XLR, which is expected to begin service in Q2 2024, with, with 550 orders in backlog, is projected to further consolidate Airbus' dominant presence in the narrow-body segment.²⁴ The model is designed with an extended range of 8,700 kilometers, becoming the world's longest-range single-aisle aircraft and allowing point-to-point travel in long-distance routes which were previously deemed uneconomical through twin-aisle aircraft.²⁵ One of the aircraft's main differentiating features is its internal infrastructure which maximizes the seat-to-aisle ratio. This element will enable a 20% seat cost advantage over widebody airplanes and a 30% reduction in fuel per seat.²⁶ Industry dynamics are also projected to be impacted since Boeing has not announced any direct competitor product within its R&D pipeline.²⁷

There are also a few smaller players in the industry, namely Embraer and Bombardier, which are present in the niche markets for small regional jets and business jets, respectively, meaning that they do not represent relevant competition to Boeing's narrow and wide-body commercial segments. Embraer's CEO recently stated that they do not plan on entering the single-aisle category of 180 to 240 seats in which they would compete with Boeing and Airbus.²⁸ Chinese company COMAC has recently emerged with the C919, a narrow-body aircraft in development since 2008, however only 8 units have been produced so far. This new entrant may represent another competitor, particularly in the domestic Chinese market, but significant progress must be made until it can compete with the incumbents.²⁹

To better examine the customer base of the worldwide market, we conducted an analysis of the top-3 largest airlines per geography. When looking specifically into the narrow-body type, it is possible to understand that 39% of this fleet is supplied by Boeing. Of the remaining percentage, 60% of the fleet is manufactured by Airbus and the remaining 1% produced by other companies such as Embraer or Bombardier, revealing a tendency for European aircraft. Contrary to the hypothesis suggesting that American companies like Delta Airlines, American Airlines, and United Airlines have a homogeneous fleet comprised of Boeing, 1,003 out of the 2,358 single-aisle airplanes operated by the top U.S. air travel operators belong to Airbus. On the other hand, in Europe there is a significant predominance of Airbus airplanes among the largest airlines such as Lufthansa Group or the International Airlines Group (IAG). In fact, 76.4% of the fleet is produced by Airbus, leaving 21% of the market share to Boeing. With that said, it can be argued that there is a political relationship in Europe between local airlines and Airbus, which justifies the lack of heterogeneity of manufacturers among the fleet. Such a conclusion is understandable as several E.U. governments belong to the shareholder structure of Airbus, whereas Boeing is owned by retail and institutional investors.

The twin-aisle market, primarily used for long-distance travel, is led by Boeing through its wide-body jets, which have proven superior to Airbus' A350, having achieved slightly under three times the number of wide-body cumulative net orders relative to the European

Exhibit 19: Boeing 777-8 vs. A350
Source: Boeing, Airbus

	Boeing 777-8	A350
Range (km)	16,190	15,372
Maximum Passenger Capacity	395	369
Fuel Capacity (liters)	198,000	166,488
Cargo Capacity (m3)	230	208

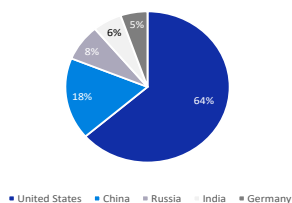
company by 2022.³⁰ Boeing's product offering in the segment include the 747, 767, 777 and 787, with the 767 constituting the highest selling Boeing widebody airplane in 2022, with 35% of the company's twin-aisle deliveries. Conversely, Airbus competes in the segment by producing the A330 and the A350, with the latter representing 65% of the company's wide-body deliveries in 2022. Regarding the distribution of twin-aisle airplanes across the largest airlines in the Middle East, it is possible to signal that the region's fleet is predominantly composed by this aircraft type, amounting to 90% of the fleet of Emirates, Etihad Airways and Qatar Airways. Moreover, Boeing is the biggest supplier of wide-bodies for the three companies, with 55%, 78% and 65% respectively. The superiority of Boeing and Airbus' lack of presence in this segment is also clear regarding the number of aircraft supplied to the top-3 airlines in the U.S., since 81% of the airplanes are produced by the American manufacturer.

Boeing Defense, Space & Security

Industry Outlook

The Defense, Space and Security industry is influenced by macroeconomic and geopolitical factors, such as dependence on government budgets, as well as global conflicts and trade sanctions, contributing to its volatility.

Exhibit 20: Top 5 Defense Budgets (%)
Source: SIPRI



On the Defense and Security side, until 2022 the global military expenditure as a share of world's GDP was kept stable at around 2% since there were no large-scale conflicts involving major countries.³¹ However, ongoing geopolitical tensions, regional conflicts, and security threats play an important role on the demand side for Defense and Security hardware and services and can quickly change this scenario. It was the case in February of 2022, when Russia launched an invasion of Ukraine and allied countries spent additional amounts to support the invaded country. The United States, which holds 64% of the top-5 military budgets worldwide, has spent \$30Bn in defense equipment to support Ukraine, surpassing the EU countries contribution for military equipment, equivalent to \$13Bn. In addition, the Israel-Hamas conflict is likely to induce a further boost to future defense spending. Particularly, the U.S. has approved a \$14.5Bn military aid package to support Israel and further bills can be expected to occur in the future.³² Given that Boeing's BDS revenue primarily relies on the U.S. government (66%), the company stands to benefit from these geopolitical developments through the additional government defense spending used to support allied countries and the necessary spending to re-establish the depleted stock levels.

Due to the increased military tensions in Europe, NATO member-states have pledged to further increase their defense spending budgets. The United Kingdom and Poland are already above the 2% NATO guideline for defense spending relative to GDP, other members are likely to follow the same path. In fact, Hungary and Romania are set to achieve this goal in 2023.³³ These are additional future revenue streams for the American industry, including Boeing, given that, as mentioned in the segment's company overview section, European governments source their defense equipment mainly from the U.S. through the FMS scheme.

Regarding Space exploration, NASA leads the field with programs such as its Commercial

Crew Program. Boeing and SpaceX have been selected as providers for the spacecrafts, with Boeing's Starliner scheduled to start operating in 2024.

Macroeconomic Environment

Inflation is one of the key macroeconomic variables in the Defense, Space and Security segment, especially concerning U.S. government contracts. The Office of Management and Budget (OMB) favors fixed-price contracts rather than cost-based, constituting 57% of all U.S. DoD contracts between 2016 and 2021.³⁴ In these firm-fixed price contracts, agreed-upon price remains constant, regardless of the costs incurred by the contractor.³⁵ In times of high inflation levels, contractors carry the cost risk, leading to cost-overruns and lower profitability. This has been Boeing's case as 15% of its defense revenues are tied to these contract types, signed in periods of lower inflation. Such deals, which include the delivery of two Air Force One planes and a satellite contract, have led to charges of \$933Mn in Q3 2023.³⁶ Given that Boeing's global supply-chain encompasses 58 countries, the stabilization of inflation in the short term will be critical to offer additional predictability as these contracts progress towards conclusion.³⁷

Exhibit 21: Forecasted Inflation Rate (%)
Source: IMF

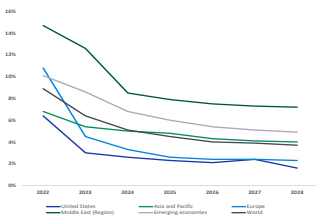
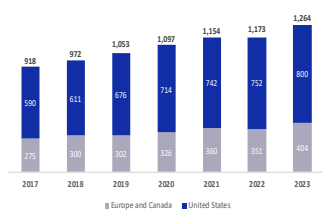


Exhibit 22: NATO Defense Expenditures (\$Bn)
Source: NATO



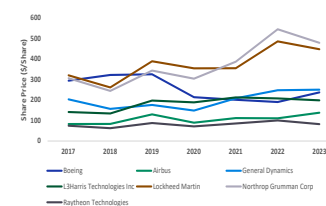
Regarding future fiscal spending decisions, the Biden Administration submitted a proposal for the Fiscal Year 2024 Budget to Congress, requesting \$885Bn to the Department of Defense (DoD), an increment of \$85Bn relative to 2023.³⁸ Moreover, the United States government spending in defense is projected to grow at a CAGR of 3% between 2023 and 2029. In NATO's case, 2023 will reach an all-time-high defense expenditure worldwide, rising to \$1,264Bn. NATO Europe and Canada's expenditure increased by 15% from 2022 to 2023.

In what relates to space exploration, the National Aeronautics and Space Administration (NASA) reported that \$26.5Bn for fiscal year 2024 will be made available, focusing on investments towards the International Space Station (ISS) and space exploration.³⁹

Competitive Landscape

Despite operating in an industry with significant barriers to new entrants, Boeing's Defense, Space & Security segment has been facing strong competition from multiple companies, such as domestic peers Lockheed Martin Corporation, Northrop Grumman Corporation, Raytheon Technologies Corporation, and General Dynamics Corporation. Regarding non-U.S. companies, Airbus is the only manufacturer that competes with Boeing across three different business segments – commercial, defense, space & security (DS&S), and global services.

Exhibit 23: Peers Share Price Performance (\$/Share)
Source: Investing.com



Examining the share performance of Lockheed Martin and Northrop Grumman since 2017 reveals a significant appreciation, with stock prices reaching \$447 and \$479, respectively. Lockheed Martin grew revenues by 32% to \$66Bn, and Northrop Grumman by 41% to \$37Bn, corresponding to the second and third largest revenue increase out of the seven peers, only outpaced by L3Harris which grew 189% due to having started with a comparatively low revenue base of \$6Bn. Lockheed Martin holds a dominant position in the defense industry, particularly in the U.S. region, where approximately 73% of net sales in 2022 arise from the U.S. Government, with the Department of Defense contributing with

64%.⁴⁰ In 2023, the contractor secured the most expensive weapons system contract provided by the DoD, valued at over \$1.7Tn, for the F-35 Lightning II Joint Strike Fighter (JSF) program, a direct competitor to Boeing's fixed-wing strike fleet of fighter jets.⁴¹ Northrop Grumman Corporation offers technologies and solutions in aircraft manned and unmanned systems, space systems, missiles, and defense electronics features. The company targets government contracts with 86% of revenue sourced from the U.S. DoD in the previous fiscal year. Moreover, Northrop Grumman's B-2 Spirit stealth bomber, which has no competitor, is an important military asset supporting the U.S. Air Force.

On the high end of the competitive spectrum, Lockheed Martin, L3Harris, and Raytheon Technologies (RTX) displayed the biggest operating margins within the peer group with 13%, 12%, and 12%, respectively. RTX mainly focuses on defense electronics, avionics, and missile systems, which granted them a \$4.4Bn contract for producing the Joint Strike Fighter Propulsion Systems. Despite presenting competitive challenges to Boeing, the two companies also drive value from their cooperation, such as in the production of F-35 Lightning II JSF propulsion systems.⁴² Looking ahead, RTX is poised for significant activity, given its robust backlog of \$175Bn in 2022.⁴³

On the lower spectrum, Boeing's BDS business unit booked a loss of \$3.5Bn in the past year mainly because of charges on fixed-price contracts, ending up with a negative 15% margin. Overall, the industry's operating margins fell from 9% to 6% in 2023. In more detail, the margins of the players exclusively focused on the defense sector ranged from 10% to 13%. On the other hand, both companies operating in multiple industries – Boeing and Airbus – were the only ones with negative operational profitability in their respective defense segments, implying that the lack of focus relative to their counterparts may have negatively affected their financial performance.

Airbus derives 19% of its \$58.8Bn revenues from the Defense and Space segment, which has a backlog of \$38.4 billion for this specific business unit.⁴⁴ Due to the high similarity in target markets and business models between both companies, many of their products end up competing in many fields. In the heavy-lift military transport capabilities market, Airbus' most successful offer is the A400M Atlas, while Boeing manufactures the C-17 Globemaster III. Whereas the American company has been working on its United Launch Alliance (ULA) joint-venture with Lockheed Martin for NASA's space launch services, its homologue in Europe is part of the development team of the Ariane Rocket family for the European Space Agency.

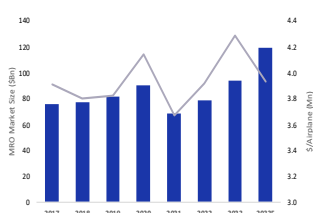
Boeing Global Services

The global Maintenance, Repair, and Overhaul (MRO) market has been gradually rising over the past seven years, currently sitting at \$93.9Bn from the \$75.6Bn it achieved in 2017. This growth coincides with the expansion of the global fleet size, which rose from 19,332 to 21,891 units in the same period. By analyzing the annual market size alongside the global fleet size, we can see that the average MRO revenue per airplane has averaged \$3.9Mn over the examined historical period. To forecast the MRO market's future size, we assume this driver to remain constant in the forecasted period at \$3.9Mn per airplane, given its historically strong correlation, and factor in our previously mentioned global fleet forecast for 2033 of

Exhibit 24: Largest Defense Contractors (2022)
Source: Companies' Annual Report

Company	Rev. (\$Bn)	Op. Margin	Leverage
Boeing BDS	23	-15%	-
Airbus DS	11	-1%	-
General Dynamics	39	11%	1.9x
L3Harris	17	12%	2.0x
Lockheed Martin	66	13%	1.3x
Northrop Grumman	37	10%	2.1x
RTX Corp.	67	12%	2.2x

Exhibit 25: MRO Total Market (\$Bn), MRO \$/Airplane (Mn)
Source: Oliver Wyman, Own Analysis

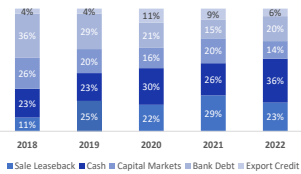


30,347 airplanes. Therefore, the industry is expected to reach \$119Bn by 2033, reflecting an implied CAGR of 2.4%. The upsurge of narrow-body aircraft fleets due to the heightened global passenger traffic predicted by IATA, particularly in the APAC region (4.6% CAGR until 2040), and the necessary restart of maintenance deferrals on aircraft returning from prolonged storage periods caused by the COVID-19 pandemic, both support the heightened demand for maintenance and repair services in the future.

Boeing Capital

The world's aircraft fleet has been progressively shifting towards lease-based operations, which represented 47% in 2022, compared to 53% of the industrywide fleet which was owned. Considering the recent rise in interest rates from most central banking institutions, as well as the unpredictability of political environments across the world, exemplified by the COVID-19 pandemic, the Russia-Ukraine war or the Gaza-Israel conflict, the role of leasing can be expected to be sustained in the future, as airlines will want to be prepared for market volatility and maintain flexibility. The sale and leaseback arrangement has historically been an important source of funding by airlines, amounting to 23% of total industry deliveries financing sources, more than double 2018's percentage.⁴⁵ Nevertheless, cash continues to be the industry's main funding source, having strengthened its share relative to 2021, which is not surprising given the current interest rate environment.

Exhibit 26: Industry Delivery Funding Sources
Source: Boeing



Annex: Full Report

“THE BOEING COMPANY”

COMPANY REPORT

“AEROSPACE & DEFENSE”

20 DECEMBER 2023

STUDENTS: “DIOGO SÁ & DIOGO VIANA”

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Turbulence easing after crosswinds

Learning from the past to thrive in the future

- **Boeing Commercial Airplanes** – As the effects arising from recent crises start vanishing, BCA will deliver 9,031 aircraft units to meet heightened global passenger demand, projected to grow at a 3.4% CAGR until 2040, as per IATA. With middle-income households rising 90% until 2042 in emerging markets, new low-cost airlines boost the propensity to fly registered in these regions. Global commercial fleet will expand 39%, with efficient and long-range single-aisle airplanes leading the growth. Consequently, this segment will grow from 2024 to 2033 at a CAGR of 5%.
- **Boeing Defense Systems** – Boeing’s defense and space business unit is expected to benefit from 2.4% of the U.S. defense and space budget, which will increase by 19% from 2023 to 2024. Other NATO countries’ increase in defense spending, to achieve the guideline of 2% of GDP, will boost revenue at a 7% CAGR through the U.S. FMS scheme. Cost overruns are expected ease over the medium term, driving overall cost of products to decline from 109% to 93% of revenues.
- **Boeing Global Services** – The global services segment will benefit from additional maintenance services and digital solutions through BCA and BDS growth, representing 38% and 32% of each respective segment’s annual revenues.

Company description

The Boeing Company stands as a leading global Aerospace & Defense firm specialized in manufacturing, designing, and serving commercial aircraft, defense products, and space exploration systems. As a key U.S. exporter, Boeing focuses on advancing technologies with implications for the future of the aerospace industry.

Recommendation: BUY

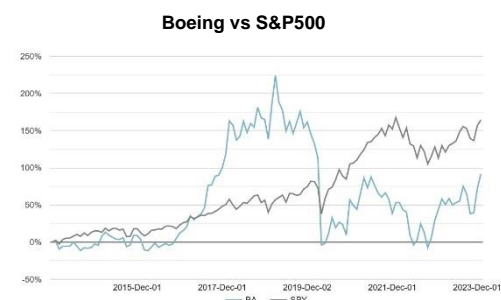
Price Target FY24: 313.37 €

Price (as of 20-Dec-23) 264.40 €

Reuters: BA.N, Bloomberg: BA:US

52-week range (\$)	176.25-265.52
Market Cap (\$Mn)	117.366
Outstanding Shares (Mn)	598.24

Source: Bloomberg



Source: Aiolux

(Values in \$ millions)	2022	2023E	2024F
Revenues	66,592	78,747	135,226
EBITDA	(1,574)	477	9,220
Net Profit	(5,053)	(2,303)	3,589
EPS	(8.45)	(3.85)	(6.00)
P/E	-	-	-

Source: Bloomberg and Analyst Estimations

THIS REPORT WAS PREPARED EXCLUSIVELY FOR ACADEMIC PURPOSES BY DIOGO SÁ & DIOGO VIANA, MASTER IN FINANCE STUDENTS OF THE NOVA SCHOOL OF BUSINESS AND ECONOMICS. THE REPORT WAS SUPERVISED BY A NOVA SBE FACULTY MEMBER, ACTING IN A MERE ACADEMIC CAPACITY, WHO REVIEWED THE VALUATION METHODOLOGY AND THE FINANCIAL MODEL. (PLEASE REFER TO THE DISCLOSURES AND DISCLAIMERS AT END OF THE DOCUMENT)

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Company Overview

Boeing Commercial Airlines (BCA)

This segment encapsulates Boeing’s commercial aviation business unit, focused on the development and manufacturing of both narrow-body and wide-body commercial jet aircraft, primarily serving the airline industry. Additionally, it extends its reach into the private market through the production of business jets. The segment includes five aircraft models – 737, 747, 767, 777, and 787 – with the 737 being the flagship product, constituting 80% of the 480 deliveries in 2022. Across the Atlantic, Airbus emerges as Boeing’s primary competitor in the commercial aviation division, having delivered 661 units in the same year.

Boeing’s commercial aircraft business represents a significant operational segment, contributing 39% to the total revenue generated in 2022, equaling \$25.9Bn. Despite substantial revenue, the segment has reported consistently negative earnings from operations since 2019, with a 2022 loss of \$2.4Bn and a negative operating margin of 9.2%. In contrast, its European counterpart Airbus achieved a positive 9.0% operating margin, driven by €41.4Bn in revenue, surpassing Boeing. The performance disparity is attributed to Airbus’ higher deliveries and an improved order book during this period, accumulating 2,363 compared to Boeing’s 695 since the grounding of the 737. Boeing showed improvements in operating margins in the segment in 2022 (transitioned from -33% to -9%) driven by factors such as the absence of the \$3.5Bn reach-forward loss related to the 787-program in 2021, increased 737 deliveries, and lower production costs. However, these gains were partially offset by higher R&D expenses. Additionally, the company faced charges equivalent to \$212Mn related to the Russia-Ukraine conflict due to the interruption of services to Russian clients.¹

Airlines curate their fleet composition considering multiple factors such as long-term corporate strategy and specific route networks. Another important aspect is the impact of national governments favoring domestic entities over foreign manufacturers through political pressure. Illustrative examples include the German airline Lufthansa and the British International Airlines Group (IAG), relying predominantly on European aircraft producers for their fleets (79% and 72% of their fleets, respectively). In contrast, American carriers like Southwest Airlines and United Airlines exhibit preference for American-manufactured aircraft, with reliance rates of 100% and 81%, respectively).²

United States

The United States (U.S.) accounted for 48% of BCA revenues from 2020 to 2022, making it the segment’s primary revenue stream. This presence implies the U.S.

Exhibit 1: Historical BCA Revenue (\$Bn)
Source: Boeing Annual Report

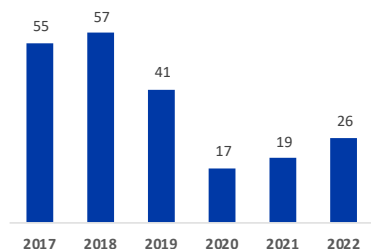
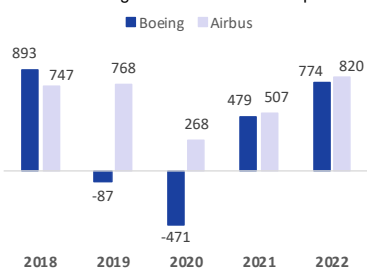


Exhibit 2: Historical Boeing’s and Airbus’ net orders
Source: Boeing and Airbus Annual Report



is Boeing’s “home protected” market, where the company’s aircraft constitute 63% of the total fleet that the industry delivered to North America. Despite facing global challenges such as the 737 Max groundings in 2019 and the COVID-19 pandemic in 2020 that impacted financial results across regions, the U.S. segment has been the fastest to rebound from this downturn. It not only recovered 79% of 2018’s revenue levels but also outpaced the non-U.S. segment, which achieved a 32% recovery relative to the same year. This resurgence was buoyed by the revitalization of the commercial market and the return to service of the 737 Max. Airplane deliveries in 2022 have already surpassed 2018’s levels, with available quarterly data for 2023 indicating a trajectory towards achieving the most prolific delivery year within the examined historical period. This positive trend is expected to persist despite the discovery in August of a manufacturing defect on the 737 Max.³

Non-U.S.

Asia emerges as a focal point for BCA within the non-U.S. geography, serving as its largest contributor in 2022. Historically, it held the position of the world’s largest market before the crises of 2019 and 2020. In 2022, Asia contributed 33% to the non-U.S. revenues of \$13.6Bn. However, recovery has stalled in Asia, operating at just 21% of pre-crisis revenue levels. This deceleration is due to China’s extension of 737 Max grounding restrictions beyond the timeline enacted by the rest of the world. As Boeing only managed to deliver 8 units to China in 2022, Airbus, in contrast, sold more than 100 during the same period. This underscores the greater foothold Airbus managed to achieve in the country after Boeing’s historical missteps.⁴ Nonetheless, there are indications that China is considering the resumption of purchases of the 737 Max by the beginning of 2024.⁵

Both Europe and the Middle East are important regions for Boeing, consistently contributing approximately 17% and 12%, respectively, to BCA’s total revenue over the past six years. Within the European region, some of Boeing’s main clients include Ryanair and Air France-KLM, possessing 299 and 288 Boeing airplanes, representing 100% and 54% of their respective fleets.⁶ In general terms, Airbus is ahead of Boeing in the European market, securing 48% of total aircraft deliveries in the region in 2022, compared to Boeing’s 27% share.

Boeing Defense, Space & Security (BDS)

BDS is Boeing’s second-largest business unit, representing 35% of total revenues in 2022, and ranks as the world’s fifth-largest defense contractor.⁷ The unit engages in the research, development, and production of military aircraft and weapons systems. Moreover, Boeing offers a range of human space flight and launch systems, including orbital satellites. The segment’s primary client is the

Exhibit 3: BCA Revenue distribution by geography (2017-2022)
Source: Boeing Annual Report

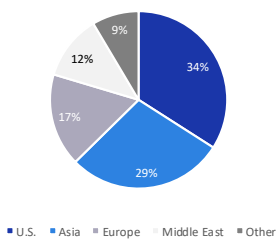
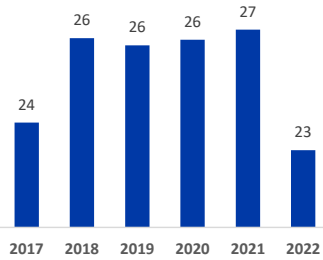


Exhibit 4: Historical BDS Revenue (\$Bn)
Source: Boeing Annual Report



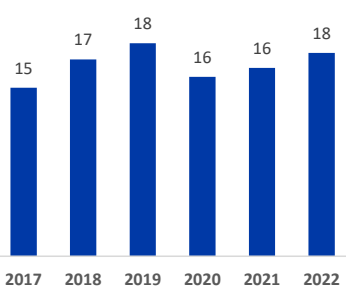
United States government, namely the United States Department of Defense (DoD) and NASA, accounting for 66% of total segment revenue in 2022. In the same year, the company decided to streamline the segment’s internal divisions from eight to four in response to lackluster performance, which had culminated in a 13% YoY revenue decline for the year 2022 to \$23.2Bn.

Until 2021, the division had reported positive earnings from operations. However, in both 2022 and available 2023 quarterly data, BDS has reported negative earnings, attributed to charges in development programs, such as the Starliner astronaut spacecraft. These programs are fixed-price government contracts and have experienced major design and cost overruns. During the 2Q23 earnings call, CFO Brian West indicated limited profitability expectations for the BDS segment in the near term, as these problems are not anticipated to be resolved promptly.

Boeing’s BDS presence faces significant competition from multiple manufacturers, particularly in the domestic market. Among them, Raytheon Technologies and Lockheed Martin stand out as the largest defense providers, having recorded revenues of \$67Bn and \$66Bn in 2022, corresponding to an increment of 185% and 190% relative to Boeing, respectively. While Europe hosts a few defense players, such as Airbus or Thales, 63% of the EU’s defense budget is allocated to U.S. players. This is mainly due to the U.S. Foreign Military Sales (FMS) scheme, enabling foreign governments to engage directly with the Pentagon, bypassing traditional defense contractors and expediting the procurement of defense equipment. The absence of an equivalent program in Europe puts local players at a distinct disadvantage.⁸

Boeing Global Services (BGS)

Exhibit 5: Historical BGS Revenue (\$Bn)
Source: Boeing Annual Report



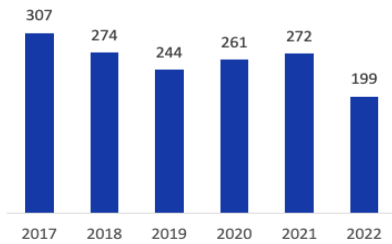
Boeing Global Services delivers to its customers – both commercial and governmental – a full spectrum of solutions based on fleet availability and mission-readiness. This segment focuses on supply chain and logistics management, maintenance, repair, overhaul (MRO), pilot and maintenance training systems, as well as digital solutions and data analytics.⁹ One of BGS’s key differentiators is Jeppesen, a technological company acquired in 2000 by Boeing, which offers a range of navigation information and flight planning solutions. Jeppesen’s navigation charts, commonly referred to as “Jeps” are used by nearly 80% of pilots across 400 airlines worldwide, irrespective of the aircraft type they operate.¹⁰

Boeing expanded its presence in both Europe and Asia by establishing distribution centers in Germany and Poland, as well as the adoption by the Japan Airlines of the Boeing Insight Accelerator program. Over the past three years, Boeing Global Services has kept a steady share of the company’s revenues at 26%, indicating that the segment has been growing at the same pace as Boeing. The increment of

\$1,283M from 2021 to 2022 is mainly attributed to higher commercial services volume and is in part offset by decreased government services volume. Unlike the two main business units, BGS’ earnings from operations have been positive and gradually increasing. In the aftermath of the COVID-19 pandemic, the segment experienced a significant recovery of its operating margin, growing from 2.9% in 2020 to 15.5% in 2022.

Boeing Capital Corporation (BCC)

Exhibit 6: Historical BCC Revenue (\$Mn)
Source: Boeing Annual Report



Boeing Capital Corporation operates a fully owned subsidiary, serving as the financing arm of the aircraft manufacturer. This segment plays a global role in offering a wide range of optimal financing solutions to the company’s costumers. It supports the remaining business units by arranging, structuring, and providing asset-based financing and leasing to assist in the sale and delivery of Boeing products and services worldwide. Boeing’s delivery funding includes financial instruments such as export credit, bank debt, capital markets, and sale leaseback. In the recent past, the segment’s revenues experienced a downtrend as BCC lowered gains from the re-leasing of assets. Earnings from operations were also greatly affected by receivable losses from the Russia-Ukraine war, with operating margins falling from 39% in 2021 to less than half (15%) in 2022. Although customer financing provided in 2022 equaled \$96Mn, marking a significant increase compared to 2021, where no new customer financing was provided, the total customer financing and investment portfolio decreased 13% mainly due to portfolio run-off.

Amidst an economic environment of high interest rates, the aviation industry’s delivery funding landscape has been reflecting the de-leveraging efforts made by airlines. As such, airlines are increasingly opting for cash as a source of capital for aircraft acquisitions rather than tapping into available credit facilities. For the American manufacturer, the proportion of clients using cash as a funding source has increased from 24% in 2018 to 54% in 2022. In the same line, the recourse to sale leaseback arrangements has emerged as a favourable funding alternative. Oppositely, bank debt, which held the leading position as a funding source in 2018, declined and currently ranks as the third most important source in 2022. This descent is attributed to escalating financing costs triggered by the surge in interest rates.

In early 2023, the company integrated BCC into the commercial airlines segment to streamline its corporate structure.

Shareholder Structure

The Boeing Company began trading on the New York Stock Exchange (NYSE) on January 2, 1962, following an initial public offering (IPO). In terms of leadership, the company’s operations are monitored by David L. Calhoun, who has assumed the role of CEO in 2020 after the removal of his predecessor, Dennis Muilenburg. Muilenburg’s departure was prompted by the aftermath of the 737 Max crises and subsequent challenges in stabilizing the company.

Boeing’s ownership structure is predominantly shaped by institutional investors, who hold a majority stake at 51%, with The Vanguard Group, Newport Trust Company, and BlackRock, Inc., emerging as the top-three equity holders. The remaining 49% are in the power of retail investors. Put in absolute terms, as of January 20, 2023, the aircraft manufacturer had 88,322 shareholders on record.¹¹ This shareholder structure reflects a more disperse range of investors compared to the consortium model of Airbus. In the European manufacturer’s case, 26% of the ownership is detained by a Shareholder’s Agreement between the French, German, and Spanish governments, with each holding 11%, 11%, and 4%, respectively. The remaining outstanding shares of Airbus are free float (74%).

The Sector

Boeing Commercial Airplanes

Economic Overview

The financial performance of the commercial aviation sector is directly tied to long-term trends in the aviation industry, particularly the relationship between Revenue Passenger Kilometer (RPK), representing the total distance covered by paying passengers, and Gross Domestic Product (GDP). As shown in Exhibit 8, a strong positive correlation emerges between these variables. This correlation is rooted in economic growth, which not only increases disposable income but also propels citizens from low to middle income, fostering an increased propensity to spend on air travel. Ultimately, such an escalation in demand requires additional aircraft to be made available to match the market’s needs. In the first quarter of 2023, RPKs managed to recover to 88% of pre-pandemic levels. Nevertheless, recovery was felt differently throughout the regions. Whereas Europe, Latin America and the Middle East managed to regain their competitive positions, international flights involving the Asia-Pacific region had been the slowest segment to recover from the shock until 2022, mainly due to China’s long lockdown period. However, given the normalization of activity, the Asia-Pacific region has recouped its position as the leading region of the world’s RPKs.¹²

Exhibit 7: Boeing Shareholder Structure (\$Bn)
Source: Boeing Annual Report

Top-3 Shareholders	Share
The Vanguard Group	7.7%
Newport Trust Company	7.4%
BlackRock, Inc.	5.6%

Exhibit 8: Historical RPK vs. Real GDP (%)
Source: IATA

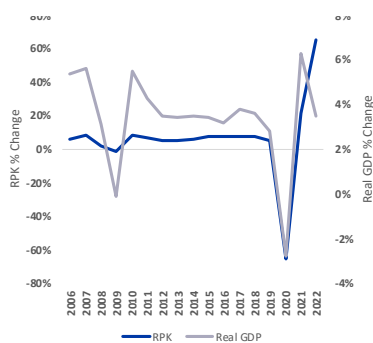


Exhibit 9: Regional share in global RPKs
Source: IATA

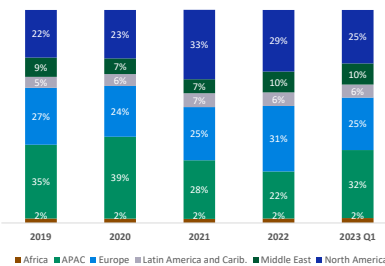
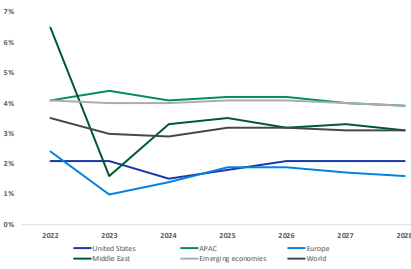
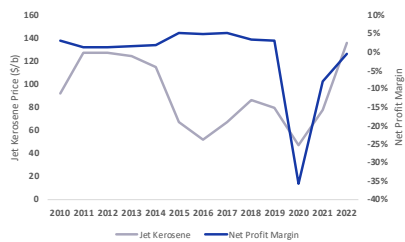


Exhibit 10: Forecasted Global GDP Growth
Source: IMF



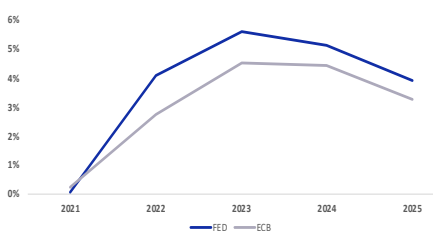
Regarding the future, IATA projects the demand for air travel to double by 2040, growing at an average annual rate of 3.4%. The Asia-Pacific region is expected to be the main contributor towards this growth, adding 2,554 million passengers, which corresponds to a 4.6% CAGR from 2019 to 2040. The reasons underlying this forecast are the promising demographics and growth in household earnings, which fall in line with reports by the U.S. Office of National Intelligence, estimating most of global population growth for the next two decades to come from South Asia and Sub-Saharan Africa,¹² and by S&P Global that expects APAC to go from 37% to 42% of the world’s GDP by 2040.¹³ More specifically, middle-class households in emerging markets are forecasted to grow by 90% through 2042.¹⁴ On the lower end of the spectrum, Europe will be the lowest growing region at 2.1% CAGR in the same period.¹⁵

Exhibit 11: Historical Jet kerosene Price vs. Net Profit Margin
Source: IATA



Another key factor posing volatility to such industries is the instability in oil prices due to embargos following international conflicts such as the one between Ukraine and Russia, which directly impacts operational costs for airlines. This factor’s influence is underscored by the fact that fuel costs represent 30% of total expenses incurred by airlines.¹⁶ Exhibit 10 demonstrates that there is a quasi-perfect negative correlation of 0.96 between jet kerosene prices and the net profit margins of global commercial airlines from 2010 and 2019. Although there are other variables influencing net profitability, this significant negative correlation suggests that, during this period, air travel operators absorbed the additional cost of rising fuel prices rather than passing it through to clients. Due to the additional pressure on earnings, airlines are incentivized to anticipate the replacement of outdated and less fuel-efficient aircraft with more technologically advanced alternatives. However, the dynamics of this relationship inversed between 2020 and 2022. During this period, despite a substantial increase of 191% in jet kerosene prices, net profit margins also rose 97%. This shift can be mainly attributed to the resurgence of demand post-COVID-19, as evidenced by the RPK increase of 101% in the same period. Looking ahead, BMI, a subsidiary of Fitch Solutions, forecasts global average jet fuel to be priced at \$110 per barrel in 2023, gradually easing to \$104.3 per barrel by 2027.¹⁷ Underlying this forecast is an implicit expected phase out of the temporary demand spike from 2023’s summer travel season, which had rebounded from pre-pandemic levels, driving down jet fuel prices in the future and increasing operating margins if the negative correlation is restored.

Exhibit 12: Interest Rates: FED vs. ECB
Source: FED; ECB



After a prolonged period characterized by persistently low interest rates, the U.S. Federal Reserve and the European Central Bank opted to raise interest rates in response to mounting inflationary pressures. Looking into the future, both institutions foresee a near-term reduction in interest rates, aligning with their projections of lower inflation rates – 3.9% and 3.3%, respectively – by the year

2025.¹⁸ The monetary tightening developments by most central banks in the world have the potential to drive down financing capabilities in the short-term for Boeing’s clients to finance their own operations or invest in new projects, such as in the acquisition of new aircraft, thereby limiting additional orders. Despite the recent surges in inflation, manufacturers do not pass the entirety of the costs to clients. In most contractual agreements, there is typically a “hyper-escalation” clause, where both parties are partially protected against rises in costs, agreeing to share the incremental costs.¹⁹

Market Demand

As of the latest IATA growth projections, air travel demand is anticipated to experience differentiated growth across the various regions until 2040 (see Exhibit 13). In alignment with these projections, we estimate the total fleet must expand by the same growth rates to accommodate demand. Considering the current fleet size equals 21,891 airplanes, we anticipate the total fleet to rise by 8,456 units until 2033. Most of the market deliveries from Boeing and Airbus in 2022 consisted of narrow-body airplanes (84%). We expect this trend to continue for the deliveries of new aircraft in the forecasted period, except for the Middle Eastern region which has historically privileged wide-body jets. As we will detail in the next sections, newer narrow-body airplanes not only surpass their preceding generations’ abilities with their latest technological improvements, but also present notable advantages relative to wide-body counterparts. These advancements include a 50% range improvement over the previous generations, while being able to cover 75% of transatlantic flights, a range previously exclusive to wide-body jets.²⁰ In total, narrow-body jets will account for 6,703 deliveries destined to fleet growth while widebody airplanes will account for 1,753 deliveries until 2033.

Exhibit 13: Passenger Traffic Growth (2019-2040, CAGR)
Source: IATA

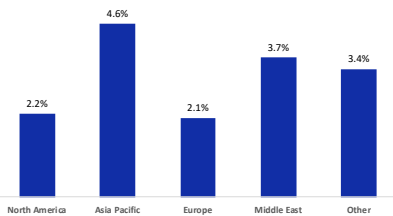
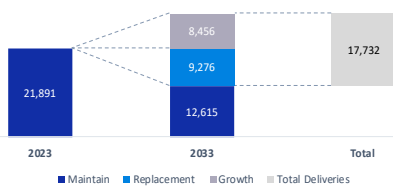


Exhibit 14: Aircraft Demand Forecast
Source: Own Analysis



Furthermore, examining retirement dynamics is a critical point to assess overall fleet deliveries in the future. Considering the current fleet size and the fact that the average aircraft retirement is typically of 23.6 years²¹, the forecasted total replacement deliveries amount to 9,276. The APAC region will replace the greatest number of jets given that it currently possesses 37% of the total worldwide fleet.

In total, the cumulative market demand for the forecasted period is projected to be of 17,732 airplanes. A slight fleet recomposing effect is expected given that while 75% of the total fleet in 2023 was composed of narrowbodies and 25% of wide-bodies, by 2033 we project narrow-bodies to grow to 76% of the total fleet.

Competitive Landscape

Once we understand the needs of the market during the period in analysis, it is fundamental to assess if the Aerospace industry has the capacity to supply those

aircraft and therefore fulfill the demand. Boeing and Airbus stand out as the primary players in the aircraft manufacturing market, competing for dominance across a broad spectrum of airplane types.

Boeing’s unique narrow-body product is the 737 jet along with its variations, which have not achieved the same success in number of orders relative to its competitor. Airbus has successfully developed a family of narrow-body jets, the most famous of which being the A320 and its variations. Overall, as of December 2023, Boeing had 4,590 unfilled orders for its narrow-body model, registering its record in 2018 with 5,694 aircraft orders²², whereas its competitor had 7,296 in backlog and surpassed 8,000 total orders for the first time²³. In this type, Airbus’ A319neo can be compared to the B737-MAX 7, as both are destined for short to medium-haul routes, and if we consider the range, capacity, and efficiency factors, the American aircraft comes up as the better option. Longer-range narrow-body jets have been increasingly pressuring the wide-body segment, such as the Airbus A321neoLR or the Boeing 737 Max, which have lower unitary costs compared to wide-body jets due to their smaller size and a better ability to be redeployed to alternative routes in low-season periods. When we compare the A321neo to the 737 Max 10, which is the closest equivalent in passenger capacity terms, we find that the A321neo takes the lead given that it not only 6% has more passenger capacity but is also able of achieving a range of 21% higher than its Boeing counterpart.

The coming launch of the Airbus A321XLR, which is expected to begin service in Q2 2024, with, with 550 orders in backlog, is projected to further consolidate Airbus’ dominant presence in the narrow-body segment.²⁴ The model is designed with an extended range of 8,700 kilometers, becoming the world’s longest-range single-aisle aircraft and allowing point-to-point travel in long-distance routes which were previously deemed uneconomical through twin-aisle aircraft.²⁵ One of the aircraft’s main differentiating features is its internal infrastructure which maximizes the seat-to-aisle ratio. This element will enable a 20% seat cost advantage over widebody airplanes and a 30% reduction in fuel per seat.²⁶ Industry dynamics are also projected to be impacted since Boeing has not announced any direct competitor product within its R&D pipeline.²⁷

There are also a few smaller players in the industry, namely Embraer and Bombardier, which are present in the niche markets for small regional jets and business jets, respectively, meaning that they do not represent relevant competition to Boeing’s narrow and wide-body commercial segments. Embraer’s CEO recently stated that they do not plan on entering the single-aisle category of 180 to 240 seats in which they would compete with Boeing and Airbus.²⁸ Chinese company COMAC has recently emerged with the C919, a narrow-body aircraft in development since

Exhibit 15: B737 Max 7 vs. A319neo
Source: Boeing, Airbus

	B737 Max 7	A319neo
Range (km)	7,130	6,950
Maximum Passenger Capacity	172	160
Fuel Capacity (liters)	25,800	29,659
Cargo Capacity (m3)	32	27

Exhibit 16: B737 Max vs. A321
Source: Boeing, Airbus

	Boeing 737 Max 10	A321neo
Range (km)	6,112	7,400
Maximum Passenger Capacity	230	244
Fuel Capacity (liters)	25,800	32,853
Cargo Capacity (m3)	56	51

Exhibit 17: A321XLR
Source: Airbus

	No Competitor	A321XLR
Range (km)	-	8,700
Maximum Passenger Capacity	-	220
Fuel Capacity (liters)	-	32,940

Exhibit 18: B737 Max 9 vs. A320neo
Source: Boeing, Airbus

	B737 Max 9	A320neo
Range (km)	6,570	6,500
Maximum Passenger Capacity	220	195
Fuel Capacity (liters)	25,800	32,853
Cargo Capacity (m3)	51	37

2008, however only 8 units have been produced so far. This new entrant may represent another competitor, particularly in the domestic Chinese market, but significant progress must be made until it can compete with the incumbents.²⁹

To better examine the customer base of the worldwide market, we conducted an analysis of the top-3 largest airlines per geography. When looking specifically into the narrow-body type, it is possible to understand that 39% of this fleet is supplied by Boeing. Of the remaining percentage, 60% of the fleet is manufactured by Airbus and the remaining 1% produced by other companies such as Embraer or Bombardier, revealing a tendency for European aircraft. Contrary to the hypothesis suggesting that American companies like Delta Airlines, American Airlines, and United Airlines have a homogeneous fleet comprised of Boeing, 1,003 out of the 2,358 single-aisle airplanes operated by the top U.S. air travel operators belong to Airbus. On the other hand, in Europe there is a significant predominance of Airbus airplanes among the largest airlines such as Lufthansa Group or the International Airlines Group (IAG). In fact, 76.4% of the fleet is produced by Airbus, leaving 21% of the market share to Boeing. With that said, it can be argued that there is a political relationship in Europe between local airlines and Airbus, which justifies the lack of heterogeneity of manufacturers among the fleet. Such a conclusion is understandable as several E.U. governments belong to the shareholder structure of Airbus, whereas Boeing is owned by retail and institutional investors.

Exhibit 19: Boeing 777-8 vs. A350
Source: Boeing, Airbus

	Boeing 777-8	A350
Range (km)	16,190	15,372
Maximum Passenger Capacity	395	369
Fuel Capacity (liters)	198,000	166,488
Cargo Capacity (m3)	230	208

The twin-aisle market, primarily used for long-distance travel, is led by Boeing through its wide-body jets, which have proven superior to Airbus’ A350, having achieved slightly under three times the number of wide-body cumulative net orders relative to the European company by 2022.³⁰ Boeing’s product offering in the segment include the 747, 767, 777 and 787, with the 767 constituting the highest selling Boeing widebody airplane in 2022, with 35% of the company’s twin-aisle deliveries. Conversely, Airbus competes in the segment by producing the A330 and the A350, with the latter representing 65% of the company’s wide-body deliveries in 2022. Regarding the distribution of twin-aisle airplanes across the largest airlines in the Middle East, it is possible to signal that the region’s fleet is predominantly composed by this aircraft type, amounting to 90% of the fleet of Emirates, Etihad Airways and Qatar Airways. Moreover, Boeing is the biggest supplier of wide-bodies for the three companies, with 55%, 78% and 65% respectively. The superiority of Boeing and Airbus’ lack of presence in this segment is also clear regarding the number of aircraft supplied to the top-3 airlines in the U.S., since 81% of the airplanes are produced by the American manufacturer.

Boeing Defense, Space & Security

Industry Outlook

The Defense, Space and Security industry is influenced by macroeconomic and geopolitical factors, such as dependence on government budgets, as well as global conflicts and trade sanctions, contributing to its volatility.

On the Defense and Security side, until 2022 the global military expenditure as a share of world’s GDP was kept stable at around 2% since there were no large-scale conflicts involving major countries.³¹ However, ongoing geopolitical tensions, regional conflicts, and security threats play an important role on the demand side for Defense and Security hardware and services and can quickly change this scenario. It was the case in February of 2022, when Russia launched an invasion of Ukraine and allied countries spent additional amounts to support the invaded country. The United States, which holds 64% of the top-5 military budgets worldwide, has spent \$30Bn in defense equipment to support Ukraine, surpassing the EU countries contribution for military equipment, equivalent to \$13Bn. In addition, the Israel-Hamas conflict is likely to induce a further boost to future defense spending. Particularly, the U.S. has approved a \$14.5Bn military aid package to support Israel and further bills can be expected to occur in the future.³² Given that Boeing’s BDS revenue primarily relies on the U.S. government (66%), the company stands to benefit from these geopolitical developments through the additional government defense spending used to support allied countries and the necessary spending to re-establish the depleted stock levels.

Due to the increased military tensions in Europe, NATO member-states have pledged to further increase their defense spending budgets. The United Kingdom and Poland are already above the 2% NATO guideline for defense spending relative to GDP, other members are likely to follow the same path. In fact, Hungary and Romania are set to achieve this goal in 2023.³³ These are additional future revenue streams for the American industry, including Boeing, given that, as mentioned in the segment’s company overview section, European governments source their defense equipment mainly from the U.S. through the FMS scheme.

Regarding Space exploration, NASA leads the field with programs such as its Commercial Crew Program. Boeing and SpaceX have been selected as providers for the spacecrafts, with Boeing’s Starliner scheduled to start operating in 2024.

Macroeconomic Environment

Inflation is one of the key macroeconomic variables in the Defense, Space and Security segment, especially concerning U.S. government contracts. The Office of Management and Budget (OMB) favors fixed-price contracts rather than cost-

Exhibit 20: Top 5 Defense Budgets (%)
Source: SIPRI

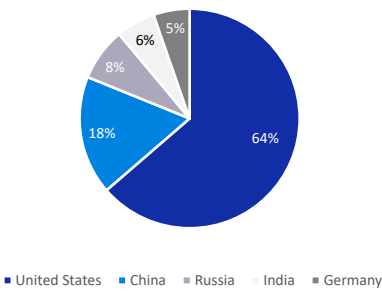


Exhibit 21: Forecasted Inflation Rate (%)
Source: IMF

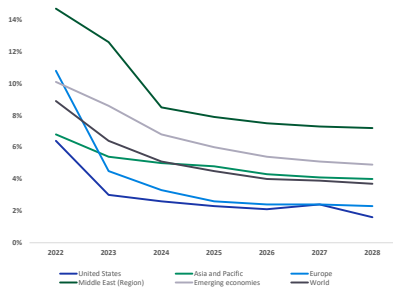


Exhibit 22: NATO Defense Expenditures (\$Bn)
Source: NATO

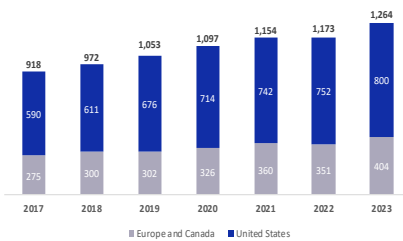
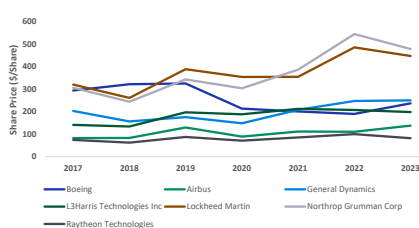


Exhibit 23: Peers Share Price Performance (\$/Share)
Source: Investing.com



based, constituting 57% of all U.S. DoD contracts between 2016 and 2021.³⁴ In these firm-fixed price contracts, agreed-upon price remains constant, regardless of the costs incurred by the contractor.³⁵ In times of high inflation levels, contractors carry the cost risk, leading to cost-overruns and lower profitability. This has been Boeing’s case as 15% of its defense revenues are tied to these contract types, signed in periods of lower inflation. Such deals, which include the delivery of two Air Force One planes and a satellite contract, have led to charges of \$933Mn in Q3 2023.³⁶ Given that Boeing’s global supply-chain encompasses 58 countries, the stabilization of inflation in the short term will be critical to offer additional predictability as these contracts progress towards conclusion.³⁷

Regarding future fiscal spending decisions, the Biden Administration submitted a proposal for the Fiscal Year 2024 Budget to Congress, requesting \$885Bn to the Department of Defense (DoD), an increment of \$85Bn relative to 2023.³⁸ Moreover, the United States government spending in defense is projected to grow at a CAGR of 3% between 2023 and 2029. In NATO’s case, 2023 will reach an all-time-high defense expenditure worldwide, rising to \$1,264Bn. NATO Europe and Canada’s expenditure increased by 15% from 2022 to 2023.

In what relates to space exploration, the National Aeronautics and Space Administration (NASA) reported that \$26.5Bn for fiscal year 2024 will be made available, focusing on investments towards the International Space Station (ISS) and space exploration.³⁹

Competitive Landscape

Despite operating in an industry with significant barriers to new entrants, Boeing’s Defense, Space & Security segment has been facing strong competition from multiple companies, such as domestic peers Lockheed Martin Corporation, Northrop Grumman Corporation, Raytheon Technologies Corporation, and General Dynamics Corporation. Regarding non-U.S. companies, Airbus is the only manufacturer that competes with Boeing across three different business segments – commercial, defense, space & security (DS&S), and global services.

Examining the share performance of Lockheed Martin and Northrop Grumman since 2017 reveals a significant appreciation, with stock prices reaching \$447 and \$479, respectively. Lockheed Martin grew revenues by 32% to \$66Bn, and Northrop Grumman by 41% to \$37Bn, corresponding to the second and third largest revenue increase out of the seven peers, only outpaced by L3Harris which grew 189% due to having started with a comparatively low revenue base of \$6Bn. Lockheed Martin holds a dominant position in the defense industry, particularly in the U.S. region, where approximately 73% of net sales in 2022 arise from the U.S. Government, with the Department of Defense contributing with 64%.⁴⁰ In 2023, the contractor secured

the most expensive weapons system contract provided by the DoD, valued at over \$1.7Tn, for the F-35 Lightning II Joint Strike Fighter (JSF) program, a direct competitor to Boeing’s fixed-wing strike fleet of fighter jets.⁴¹ Northrop Grumman Corporation offers technologies and solutions in aircraft manned and unmanned systems, space systems, missiles, and defense electronics features. The company targets government contracts with 86% of revenue sourced from the U.S. DoD in the previous fiscal year. Moreover, Northrop Grumman’s B-2 Spirit stealth bomber, which has no competitor, is an important military asset supporting the U.S. Air Force.

On the high end of the competitive spectrum, Lockheed Martin, L3Harris, and Raytheon Technologies (RTX) displayed the biggest operating margins within the peer group with 13%, 12%, and 12%, respectively. RTX mainly focuses on defense electronics, avionics, and missile systems, which granted them a \$4.4Bn contract for producing the Joint Strike Fighter Propulsion Systems. Despite presenting competitive challenges to Boeing, the two companies also drive value from their cooperation, such as in the production of F-35 Lightning II JSF propulsion systems.⁴² Looking ahead, RTX is poised for significant activity, given its robust backlog of \$175Bn in 2022.⁴³

On the lower spectrum, Boeing’s BDS business unit booked a loss of \$3.5Bn in the past year mainly because of charges on fixed-price contracts, ending up with a negative 15% margin. Overall, the industry’s operating margins fell from 9% to 6% in 2023. In more detail, the margins of the players exclusively focused on the defense sector ranged from 10% to 13%. On the other hand, both companies operating in multiple industries – Boeing and Airbus – were the only ones with negative operational profitability in their respective defense segments, implying that the lack of focus relative to their counterparts may have negatively affected their financial performance.

Airbus derives 19% of its \$58.8Bn revenues from the Defense and Space segment, which has a backlog of \$38.4 billion for this specific business unit.⁴⁴ Due to the high similarity in target markets and business models between both companies, many of their products end up competing in many fields. In the heavy-lift military transport capabilities market, Airbus’ most successful offer is the A400M Atlas, while Boeing manufactures the C-17 Globemaster III. Whereas the American company has been working on its United Launch Alliance (ULA) joint-venture with Lockheed Martin for NASA’s space launch services, its homologue in Europe is part of the development team of the Ariane Rocket family for the European Space Agency.

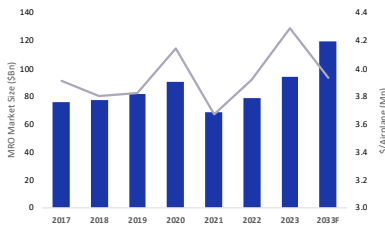
Exhibit 24: Largest Defense Contractors (2022)
Source: Companies’ Annual Report

Company	Rev. (\$Bn)	Op. Margin	Leverage
Boeing BDS	23	-15%	-
Airbus DS	11	-1%	-
General Dynamics	39	11%	1.9x
L3Harris	17	12%	2.0x
Lockheed Martin	66	13%	1.3x
Northrop Grumman	37	10%	2.1x
RTX Corp	67	12%	2.2x

Boeing Global Services

The global Maintenance, Repair, and Overhaul (MRO) market has been gradually rising over the past seven years, currently sitting at \$93.9Bn from the \$75.6Bn it achieved in 2017. This growth coincides with the expansion of the global fleet size, which rose from 19,332 to 21,891 units in the same period. By analyzing the annual market size alongside the global fleet size, we can see that the average MRO revenue per airplane has averaged \$3.9Mn over the examined historical period. To forecast the MRO market’s future size, we assume this driver to remain constant in the forecasted period at \$3.9Mn per airplane, given its historically strong correlation, and factor in our previously mentioned global fleet forecast for 2033 of 30,347 airplanes. Therefore, the industry is expected to reach \$119Bn by 2033, reflecting an implied CAGR of 2.4%. The upsurge of narrow-body aircraft fleets due to the heightened global passenger traffic predicted by IATA, particularly in the APAC region (4.6% CAGR until 2040), and the necessary restart of maintenance deferrals on aircraft returning from prolonged storage periods caused by the COVID-19 pandemic, both support the heightened demand for maintenance and repair services in the future.

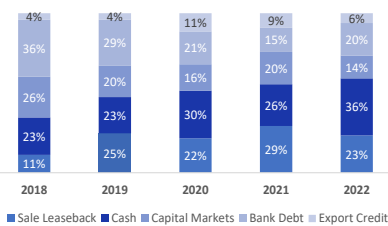
Exhibit 25: MRO Total Market (\$Bn), MRO \$/Airplane (Mn)
Source: Oliver Wyman, Own Analysis



Boeing Capital

The world’s aircraft fleet has been progressively shifting towards lease-based operations, which represented 47% in 2022, compared to 53% of the industrywide fleet which was owned. Considering the recent rise in interest rates from most central banking institutions, as well as the unpredictability of political environments across the world, exemplified by the COVID-19 pandemic, the Russia-Ukraine war or the Gaza-Israel conflict, the role of leasing can be expected to be sustained in the future, as airlines will want to be prepared for market volatility and maintain flexibility. The sale and leaseback arrangement has historically been an important source of funding by airlines, amounting to 23% of total industry deliveries financing sources, more than double 2018’s percentage.⁴⁵ Nevertheless, cash continues to be the industry’s main funding source, having strengthened its share relative to 2021, which is not surprising given the current interest rate environment.

Exhibit 26: Industry Delivery Funding Sources
Source: Boeing



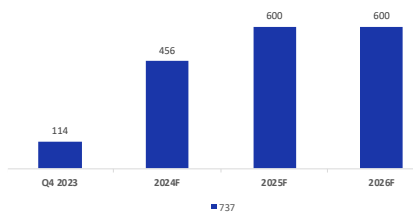
Financial Analysis

In this financial analysis, adopting a forecast period of 10 years until 2033 accommodates our assessment of how the industry dynamics will influence Boeing’s future cash flows and eventually reach consistently stable growth rates. Moreover, this extended timeframe allows the remaining secondary effects stemming from the current economic instability and the recent 737 Max-related crashes to dissipate.

Boeing Commercial Airplanes

To account for Boeing’s diversified customer base and acknowledge the different growth prospects across geographies, we conducted our analysis considering five key regions: the United States, Asia, Europe, Middle East, and “Other”, which aggregates areas mainly from Africa and Latin America. Moreover, we further segmented airplane deliveries into two categories: narrow-body and wide-body types, allowing for a more nuanced understanding of the fleet.

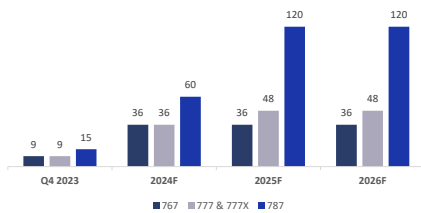
Exhibit 27: Narrow-body Production Capacity
Source: Boeing; Own Analysis



Boeing grapples with production capacity constraints, a critical consideration given that the demand for aircraft currently largely overtakes supply. By October 2023, Boeing’s backlog equaled 5,866 units, while its maximum production was 41 jets per month. Therefore, in the short-to-medium term, even while operating at full capacity, the manufacturer will be able to fulfill the delivery of all the airplanes produced in its factories, along with the aircraft units held in inventory.

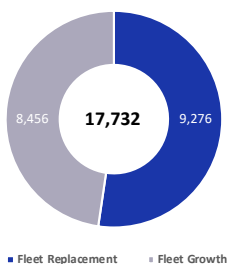
The production rate of the 737 model has been impacted by a non-conformance in the fuselage arising from the supplier’s side and is currently set at 31 units per month. Nevertheless, the problem is expected to be fully sorted by the end of 2023, which will allow the company to keep its plan of transitioning to 38 units per month.

Exhibit 28: Wide-body Production Capacity
Source: Boeing; Own Analysis



Production capacity is expected to increase to 50 aircraft per month by late 2025 or early 2026 through new production lines in Everett and North Charleston which are entering full capacity in 2025.⁴⁶ The 767 commercial program is currently producing 3 aircraft and will remain unchanged, given the low demand relative to the other wide-body jets. The current backlog for this model is 111 units, meaning that with the current production capabilities, it will take 3 years for all the orders to be fulfilled. In the 777 / 777X case, Boeing decided to halt the production of the 777X-9 during 2022 and 2023 as it works towards Type Inspection Authorization (TIA) but expects the first delivery to occur in 2025, while the first 777X-8 is set to be ready in 2027. The production capabilities of these models will be kept at 3 per month, with the aim of scaling up to 4 units per month from 2025 onwards, with a new production line in the Everett factory.⁴⁷ Lastly, the 787 program also experienced disruptions during 2023, namely a 1.5-month long delivery stoppage. However, deliveries have already been resumed and no further restrictions are in sight. The company plans to increase 787 monthly production to 5 units and is working towards increasing to 10 units per month by 2026. In terms of inventory, Boeing currently holds 250 units of the 737, currently awaiting modifications, with 150 allocated for Chinese airlines which halted purchases after the 737-Max crashes. Additionally, the manufacturer has 75 787 undergoing safety inspections. The entire inventory is set to be delivered in the short-term, with 80% anticipated in 2024 and the remaining 20% scheduled for 2025. Therefore, during the forecasted period, Boeing is expected to deliver

Exhibit 29: Forecasted Market Deliveries (2024-2033)
Source: Own Analysis



6,760 new narrow-body airplanes, contingent upon the assumption that no additional production flaws or issues arise during the certification process of the 737-7 and 737-10 models.

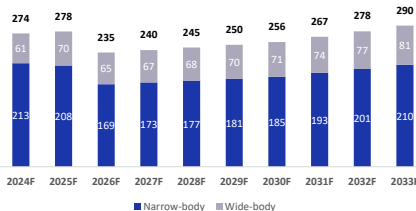
Overall, a total of 9,031 new aircrafts should be delivered until 2033 by Boeing, from which 2,270 will be twin-aisle. According to our projections, we predict that the manufacturer will be able to capture 50% of the deliveries in the forecasted period in the narrow-body segment, and 55% in the dual-aisle aircraft type.

When estimating the price per airplane sold, it is relevant to consider that an industry-wide practice involves offering discounts of approximately 50% when clients buy in bulk, which constitute most of the cases. The average price per aircraft in the narrow-body family in 2022 was \$115M, which converts into \$57M when the discount is granted. For the wide-bodies, after analyzing the individual prices for the different aircraft types and weighing them with the quantity sold during 2022, we estimated the average dual-aisle price to be of \$145M in 2023, after accounting for the applicable 50% discount. Given the prevailing supply chain disruptions and Euromonitor’s guidance indicating that U.S. inflation will take approximately two years to go back to the 2% target, it is considered that the average price per plane will grow at the same rate as the forecasted inflation for each year. Since Boeing operates in a duopoly in the Commercial aviation market, it is anticipated to pass such cost increases to clients.

The breakdown of the revenues from each region is presented next.

United States

Exhibit 30: Boeing's U.S. Forecasted Deliveries (2024-2033)
Source: Own Analysis



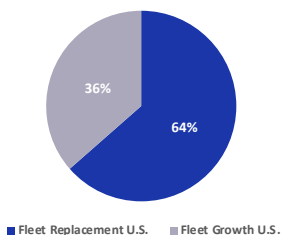
American airlines have been a significant income stream for Boeing’s Commercial Airlines segment, averaging 48% of total revenues over the past three years. Prior to the 737-crash incidents, the U.S. represented 28% of the company’s single-aisle deliveries, gradually increasing to 69% in Q3 2023, which is not representative of the U.S.’ future weight on Boeing’s commercial revenues. The surge in the country’s share of Boeing’s narrow-body deliveries is mainly attributed to China’s purchasing slowdown which, in contrast, did not happen on a comparable scale or duration in the U.S market. The key factor at play is that with the American manufacturer operating at full capacity and given the strong demand arising from all the world’s regions, a more balanced distribution of total deliveries is to be expected. Looking ahead, we estimate a gradual return to the pre-crisis average, with the country holding 28% of total Boeing narrow-body deliveries in 2026, which translates into cumulative deliveries equal to 590 units of the 737-model from 2024 to 2026. Such forecast is grounded in the expectation of a resurgence in deliveries to the Asian market, particularly China. As reports indicate an end to China’s freeze on 737 purchases, there will be a diversion of Boeing’s delivery units to the region, thereby

diminishing the U.S.’ current dominant share of narrow-body deliveries. Moreover, since ongoing safety modifications for the 737 units held in inventory are close to completion, the U.S. is also expected to benefit from the delivery of 47 of the models, with 80% scheduled for 2024 and the remaining 20% in 2025. The country’s robust backlog of 1,357 orders for the 737 model underscores the expected sustained market demand in the foreseeable future. In the medium term, from 2027 to 2030, we considered IATA’s passenger air traffic growth forecast until 2040 as a proxy to estimate the delivery growth rate for each region. As such, projections suggest that the American fleet will grow at a 2.2% CAGR, translating into 716 narrow-body deliveries in this period. As we move into the long-term forecast (2031-2033), the financial outlook for the American manufacturer should not outpace the overall economic growth in the region given the saturation of growth opportunities. As such, both segments will evolve at a steady 4.3%, the nominal GDP growth in the geography predicted by the IMF. Over the 10-year forecast, the narrow-body type will dominate the U.S. market with 73% of the total 2,613 Boeing deliveries expected to the country.

Regarding wide-body aircraft, although historical performance did not suffer from any side-effects from the 737 incidents in 2019, deliveries were severely impacted by the Covid-19 pandemic, which limited international flights. In fact, twin-aisle deliveries in 2022 were equal to 57 units, 55% of 2019’s levels. In the short-term, we believe the country will represent 32% of total Boeing deliveries, less than the pre-crisis levels of 37%, given the normalization of air traffic worldwide, particularly in high growth regions such as Asia-Pacific which will reduce the country’s weight on total wide-body deliveries. This translates to an average of 65 yearly wide-body deliveries between 2024 and 2026. Amidst such changes, Boeing’s role as a reliable American aviation manufacturer remains tight with the top 3 domestic airlines analyzed, as out of the 507 twin-aisle airplanes in operation, 412 were produced at the home country. The fact that both American Airlines and United Airlines, two of the top three main U.S. carriers by passengers carried, exclusively use wide-bodies from Boeing, with 126 and 220 units for each respectively, supports sustained demand for the medium to long term coming from fleet replacements. Additionally, American Airlines has expanded the number of wide-body flights by over 400 per month since 2022, indicating there will be a future need of additional wide-body jets to support their business strategy.⁴⁸ Overall, revenues in the U.S. market will grow at a 3.4% CAGR, reflecting the intense demand for air travel and consequence need for new aircrafts.

Based on our Market Demand Forecast, the U.S. is anticipated to require the delivery of 3,853 airplanes to meet its air travel requirements. Among these, 2,448 units are intended for the replacement of aging, less-efficient aircraft, while the

Exhibit 31: U.S. Market Deliveries (2024-2033)
Source: Own Analysis



actual market growth accounts for 1,405. Considering Boeing’s total deliveries of 2,613 units and assuming Airbus will capture the remaining segment of the American market, this positions Boeing with an implied market share of 68%. In more detail, this market share is distributed with 63% attributed to narrow-body types and 85% to wide-body.

Asia

Asia is considered an emerging market in aviation and represents an especially important revenue stream prospect for Boeing. As previously mentioned, the region has been facing several headwinds that reduced its size to 13% of Boeing’s total deliveries in 2022. Nevertheless, its potential can be exemplified by the pre-crisis periods of 2017 and 2018, where on average 34% of deliveries were directed to the region. Regarding the short-term for the narrow-body segment, we project the region to achieve pre-crisis levels of 38% of total Boeing deliveries until 2026, up from 6% in Q3 2022. This significant expansion is justified by the opening of the Chinese market in 2024, which has already recovered from pre-pandemic levels in domestic air travel and is poised to resume aircraft purchasing to accommodate the growing demand.⁴⁹ Over the past 4 years, Boeing has been keeping 100 737-units in inventory designated to Chinese clients, set to be delivered during 2024 and 2025. Moreover, given that the APAC region is predicted by the IMF to contribute to 70% of global growth in the short-term, a rebalancing of the region’s weight in total Boeing deliveries is expected to happen. In total, we predict 772 narrow-bodies to be delivered to the region from 2024 to 2026. In what relates to the wide-body segment, we forecast a rise of Asia’s weight on Boeing’s dual-aisle deliveries, coming from 26% in Q3 2023 to 32% in the following 3 years, which translates into 199 deliveries. Airline growth in the region, supported by the rising passenger travel demand due to growing disposable incomes, is projected to be supported by the Daxing International Airport in Beijing, opened in 2019. From 2020 to 2022, the airport handled 52M passengers, and it was built to handle 100M passenger per year, thereby providing the necessary slots for local airlines to expand.⁵⁰ China Southern Airlines, the biggest airline utilizing the airport, has a narrow-body fleet consisting of 40% Boeing jets, indicating Boeing is in a favorable position to take advantage of the country’s growth. The same is true for the wide-body segment given that 51% of the airline’s dual-aisle fleet is Boeing aircraft.⁵¹

In the medium term, we project Boeing’s performance to converge to the industry’s growth rate, grounded in IATA’s forecast for passenger traffic demand, which serves as a reliable proxy. This growth rate stands at 4.6% per year, the highest rate among all regions. In the long term, the company’s performance is expected to grow at the region’s nominal GDP growth rate of 6.4%.

Exhibit 32: Boeing’s Asia Forecasted Deliveries (2024-2033)
Source: Own Analysis

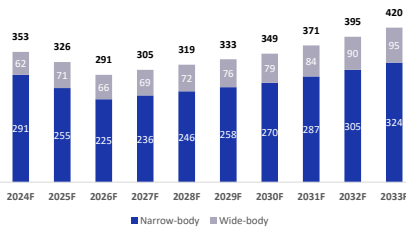
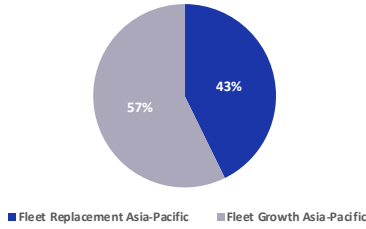


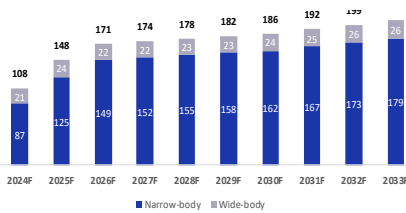
Exhibit 33: Asia Market Deliveries (2024-2033)
Source: Own Analysis



As per our market demand forecast, the APAC region will require 8,084 units from 2024 to 2033. Within this projection, 43% are intended for fleet replacement, while the remainder is dedicated to accommodating the market’s growth. Given our projections for Boeing’s performance, the company is expected to secure an overall market share of 43%, distributed with 41% in the narrowbody segment and 49% in the widebody segment. The underperformance in the APAC market when compared to Airbus is attributed to China’s strategic shift to the European manufacturer amid heightened tensions with the U.S. This shift has gained momentum with events such as France’s president Emanuel Macron’s trip to the country this year secured a “general terms agreement” for the acquisition of 150 narrow-body jets and 10 wide-body ones for Airbus. Additionally, the announcement of new Airbus assembly line in China, which will double production capacity, further solidifies its position in the Chinese aviation landscape.⁵²

Europe

Exhibit 34: Boeing’s Europe Forecasted Deliveries (2024-2033)
Source: Own Analysis



In contrast to the U.S., the European aviation market is more heterogeneous in what concerns the total fleet. In fact, Europe’s top-3 largest airlines currently operate 416 Boeing aircraft, 873 Airbus, and with 206 belonging to smaller players. As such, in 2022, Airbus directed 23% of its annual deliveries to the European market, amounting to 152 deliveries, while Boeing delivered 84 airplanes during the same period.⁵³ Moreover, air travel operators in Europe were severely affected by the on-going conflict between Ukraine and Russia. As Russia closed its aerospace to carriers from approximately 40 nations, many flights were forced to reroute, impacting travel from Europe to Asia. As of July 2023, international RPKs in the region were down 8.3% relative to its 2019 levels.⁵⁴ Nevertheless, the sanctions imposed by Western countries on Russia indirectly contributed to the expansion of air travel demand in Central Asia, driven by the expanded itineraries necessary to bypass Russia, mitigating some of the reduced demand from the conflict. In the short run, Europe’s revenues will benefit from inventory depletion predicted in 2024 and 2025, with 26 deliveries destined for this market from existing stock. Aside from the inventory effect, we forecast Europe to increase its share of Boeing’s total deliveries, recovering from the 13% registered in Q3 2023. This projection aligns with the normalization of activity, production rate upsurge, and resolution of 737-related defects, allowing for a gradual recovery to pre-pandemic region share. By 2026, we see Europe achieving 25% of Boeing’s total narrow-body production.

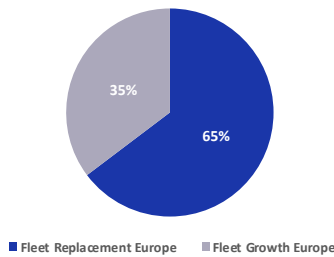
For the wide-body type, Boeing is projected to hold its dominance, with production rate increases in the 777, 777X and 787 models to widen its presence in European airspace, dedicating 11% of total wide-body production to the region by 2026. In the medium term, passenger traffic growth in Europe is anticipated to grow at a 2.1%

CAGR, resulting in 720 deliveries for the two aircraft types within this four-year-time window. As we move into the long-term, projected growth rates will gradually become closer to the IMF’s annual nominal GDP growth of 3.4% for the region’s economy.

Boeing’s additional capacity achieved through the 737 production increase to 50 units per month in 2025 (from 38 per month in 2023), will contribute to the single-market’s internal point-to-point demand, primarily driven by narrow-body aircraft. Concerning demand dynamics, Ryanair, the largest low-cost airline operating in Europe and second largest in the world, recently placed an order for up to 300 units of the 737 MAX-10 airplanes in a deal potentially reaching \$40Bn. This will increase seat capacity by 21% and reduce fuel burn by 20%, relatively to its current fleet of 737-Next Gen⁵⁵, a move which should be completed between 2027 and 2033. This order aligns with a broader trend, as other Boeing clients in the region, such as Air France KLM, with 56% of its narrow-body fleet comprised of the 737-NG (157 units), are likely to follow. Substituting it for the more efficient 737 Max-10 provides significant cost savings, which the companies can use to improve operational margins or pass to passengers into lower fares. Additionally, carriers are proceeding with the substitution of four-engine airplanes with two-engine models, such as the 777 or 787 to focus on fuel-efficiency and lower maintenance costs. However, demand will not grow as much as the single-aisle segment given the relatively lower need for large airplanes in the region, especially as narrow-body jets can progressively operate longer-haul routes, exemplified by the upcoming launch of the A321XLR and 737 MAX-10. Overall, European revenues are projected to grow at an 8.8% CAGR between 2024 and 2033, with airplane deliveries expected to reach 205 in 2033, rising from 84 aircraft deliveries in 2022.

Exhibit 35: Europe Market Deliveries (2024-2033)

Source: Own Analysis

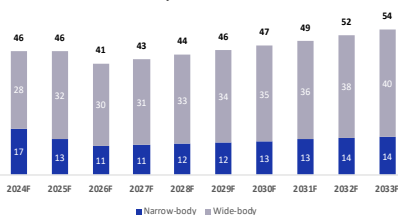


Taking this into account, by 2033 we see Boeing supplying 61% of the total single-aisle market deliveries, with Airbus securing the remaining 39%. Conversely, for the dual-aisle aircraft, Airbus is anticipated to hold 64% of the stock delivered, as the American manufacturer will produce 36%. This results in Boeing’s general market share in Europe being set at 56%.

Middle East

Exhibit 36: Boeing’s Middle East Forecasted Deliveries (2024-2033)

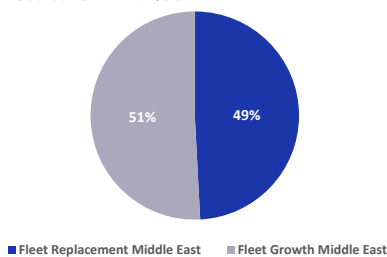
Source: Own Analysis



The Middle East is a region abundant in natural resources such as gas and oil and composed of multiple countries at different stages of development. Contributing to this development in demand is the fact that some wealthy Gulf countries, such as the United Arab Emirates, Qatar, or Saudi Arabia, have been making significant investments in infrastructure, including transportation networks, hospitals, modern cities, and airports with the objective of diversifying the overall economy from oil exports.⁵⁶

There has been a shift in the fleet deliveries for Middle Eastern players over the past seven years. Initially, from 2017 to 2020, a significant majority of the region’s demand for Boeing jets was for wide-body aircraft (84%). However, there has since been a reversal of this trend. From 2021 to Q3 2023, 76% of Boeing deliveries to the Middle East were narrow-body airplanes. This is due to the emergence of low-cost carriers such as FlyDubai, which require single-aisle jets to operate short-haul flights. In FlyDubai’s case, 100% of the fleet is composed of Boeing 737 with an average age of 4.9 years. We forecast Boeing to continue to benefit from additional deliveries stemming from market growth in the narrow-body segment, estimating 15 yearly deliveries on average between 2024-2025, above the pre-pandemic average of 7. This dynamic will follow into the future, placing Boeing’s narrow-body business with a 42% share of the deliveries expected until 2033, the remainder of which is expected to go to Airbus. In fact, Airbus has managed to capture a majority of the region’s low-cost carrier fleet, which is expected to persist in the future, given that the other carriers belonging to the top-3, namely Flynas and AirArabia, operate exclusively on Airbus single-aisle aircraft. Nevertheless, the major airline operators analyzed in the region, Emirates, Etihad, and Qatar Airways, have 90% of the fleet composed of wide-body jets, 62% of which belong to Boeing. The prevalence of this segment is due to the Middle East’s role as an aviation hub connecting key geographical areas such as Europe and Asia and the wide-body aircraft abilities in providing one-stop trips on ultra-long routes. To take this region-specific characteristic into account, we considered 84% of the market’s growth to come from wide-body deliveries, with the remainder attributed to single-aisle aircraft. Given that this role is expected to continue in the future, airlines operating Boeing jets are expected to eventually replace their fleet with newer Boeing aircraft as well. This move is driven by the recognized advantages stemming from larger fleet commonality such as reduced costs through streamlined maintenance procedures and lower crew training costs.⁵⁷ Therefore, our short-term forecast projects an average of 30 wide-body deliveries per year until 2026, positioning the Middle Eastern region to represent 15% of Boeing’s twin-aisle deliveries, aligning with pre-pandemic levels. In the medium term, we forecast the region’s growth from 2027 to 2030 to transition to IATA’s forecast for passenger growth demand, which is equal to 3.7%. The long-term growth rate is equivalent to the region’s GDP growth forecast by the IMF of 4.2%.

Exhibit 37: Middle East Forecasted Market Deliveries (2024-2033)
Source: Own Analysis



According to our forecast for the market demand, the Middle Eastern market will require 1,094 aircraft units until 2033. Out of these, 49% will be needed to replace the existing fleet, while the remaining 51% will sustain the projected market growth. We predict Boeing’s narrow-body segment during the forecasted period to secure

42% of deliveries in the narrow-body segment, along with 43% for the wide-body one.

Other

When examined individually, specific countries may not have a substantial impact on Boeing’s order book. However, their collective influence within broader regions such as Latin America, Africa, and Oceania changes this scenario. While most of these countries are geographically spread, many of them are described as emerging economies, becoming progressively more important to Boeing’s revenues. As RPKs recover to approximately 95% of 2019, there has been an intense propensity to travel and improvement of the economic outlook. Factors such as middle-class upward mobility, growth in the working-age population, and increased rates of urbanization contribute to this trend. Moreover, Africa and Latin American are the first and third largest regions in terms of land area worldwide, which implies the population centers are typically dispersed, with the few transportation infrastructures available being in poor condition. These factors contribute to the appearance of new low-cost carriers and expansion of existing ones like Ethiopian and LATAM Airlines. In the case of the African airline, 100% and 72% of its single and dual-aisle fleet is manufactured by Boeing, respectively, while the South-American operator owns a fully Airbus narrow-body fleet and fully Boeing wide-body fleet. This will make short-haul air travel accessible to more people, and Boeing is at the forefront of supplying such airlines with its 737 MAX 8/10. Furthermore, there will be a higher demand for 737 models, favored for domestic and medium-haul flights. Maintaining the historical presence in Boeing’s books, this basket of countries is anticipated to contribute 8% and 10% to the company’s deliveries in the single and dual-aisle segment until 2026, respectively. Beyond this period, their operations are protected to grow at a 3.4% CAGR in the medium term, escalating in 2031 to 6.1%, which is line with the nominal GDP growth rate forecasted for these countries. This signals that the aviation industry will simultaneously benefit and contribute to the ongoing economic expansion. All in all, revenues will increase from \$5,574Mn in 2024 to \$9,190Mn in 2033, corresponding to the delivery of 516 and 229 single and twin-aisle airplanes, respectively, between the two periods. In general terms, Boeing will hold a 47% market share against Airbus’ 53%. These numbers are explained by the supremacy (87%) of the American manufacturer in the twin-aisle segment whereas the European firm secures a 61% share of the narrow-bodies.

Exhibit 38: Boeing’s Other Forecasted Deliveries (2024-2033)
Source: Own Analysis

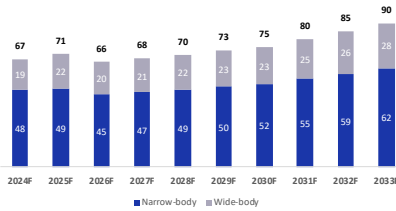
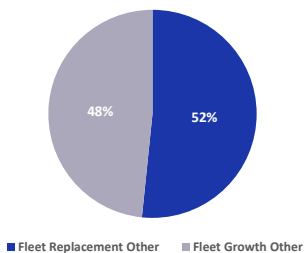


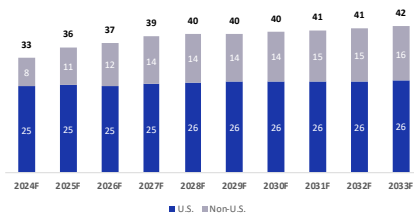
Exhibit 39: Other Forecasted Market Deliveries (2024-2033)
Source: Own Analysis



Boeing Defense, Space & Security

The future performance of the Boeing Defense, Space & Security segment can be examined considering two different revenue streams: U.S. customers and non-U.S.

Exhibit 40: BDS Revenue Forecast (\$Bn)
Source: Own Analysis



customers. In the first case, the United States government represents, 90% of the total BDS revenue coming from U.S. customers in the historical period. Hence, the main drivers to estimate this revenue source is the United States Defense and Space Budget, drawn from the total United States Government Budget, which states both historical and projected values. From 2024 until 2033, the cumulative U.S. Defense budget is expected to be \$9.33Tn, averaging \$932Bn per year. Moreover, facing the recent emergence of the Israel-Palestine conflict, the U.S. has made a commitment to provide additional military aid to Israel valued at \$14Bn in 2024, which we progressively revised downwards to \$7Bn as we move into 2025 due to our conviction that the war, and consequently additional support, may not persist beyond that year. Regarding space exploration, NASA’s budget request for FY2023 projects spending to rise 8% between 2023 and 2027 to accommodate projects on spaceflight activities and robotic missions. From then on, we project spending to grow at the United States inflation rate. Historically, approximately 2.4% of the defense and space budget has been allocated to Boeing. We anticipate that this figure should hold in the future, resulting in an average yearly value of \$23.5Bn throughout the analyzed period.

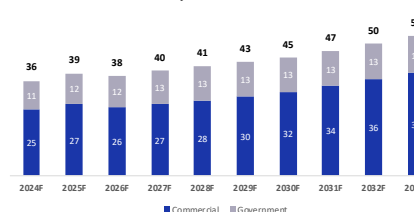
To project revenues from non-U.S. customers, we find that the NATO defense spending (excluding U.S.) is a suitable driver. Given the stringent geopolitical issues and U.S. trade laws restricting defense sales to Russia or China, NATO emerges as one of Boeing’s relevant client groups. The NATO alliance, excluding the United States, currently spends 1.2% of its nominal GDP in defense. We estimate that future NATO defense spending to gradually meet its 2% of nominal GDP guideline by 2027, following the Defense Investment Pledge made by NATO leaders in 2023 in response to the increase in geopolitical uncertainty, particularly in Ukraine.

In summation, this division’s revenues are poised to growth at a 2.7% CAGR during the forecast period, propelled by robust U.S. government spending and the gradual increase in NATO spending by non-U.S. customers.

Boeing Global Services

Established in 2017 to support Boeing’s global fleet, the Global Services segment is divided into two main client types, namely commercial and government. Both customer categories gradually evolved since the division’s inception and stabilized in percentage of revenues from 2020. As such, since 2020, the unit serving commercial airplanes has been registering an average 38% relative to BCA revenues. On the assumption that this ratio will hold into the future, the revenues for the commercial services segment are expected to evolve to \$39Bn by 2033. On the government side, revenues coming from the government averaged 32% of total

Exhibit 41: BGS Revenue Forecast (\$Bn)
Source: Own Analysis



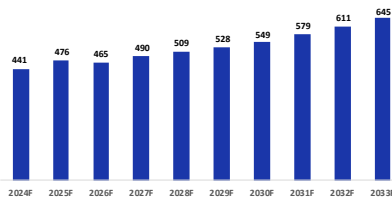
BDS income since 2020. Applying the same assumption for the future, government service revenue is anticipated to reach \$13.5Bn by 2033.

Aligned with our projection for fleet growth, an increased demand for training and professional services as well as digital solutions is also expected to occur. Additionally, maintenance and repair services will inevitably grow in tandem with the expanding total fleet. Collectively, revenues arising for the Global Services business unit should reach an all-time high of \$53.5Bn in 2033, representing a CAGR of 4.4% during the forecast period.

Boeing Capital

The revenue growth of Boeing Capital largely depends on the customer financing it provides to Boeing’s clients across various segments. Therefore, the forecast for this aspect is contingent upon the revenue levels of BCA, BDS and BGS. Looking ahead, the projected stability, set at 0.3% of revenues from other divisions, aligns with the historical average. From 2024 to 2033, the segment is expected to experience growth according to a 4.3% CAGR.

Exhibit 42: BCC Revenue Forecast (\$Mn)

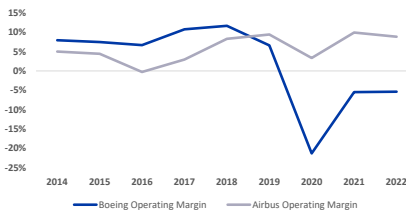


Operating Costs

Boeing’s costs and expenses fall into three categories: cost of products (involving BCA and BDS), cost of services (linked to BGS), and cost of interest expense within BCC. Focusing on the cost of products, as production rates rise, so do the costs of production. However, persisting manufacturing defects in the 737, 777X, and 787 units have posed challenges, resulting in more inspections and therefore higher unitary costs. The discovery of unintended holes in the aft pressure bulkhead of the 737-Max fuselages from supplier Spirit in August 2023 further exacerbated production delays. Moreover, the BDS segment struggles with labor instability in the sector, and development technical challenges on programs like the F-15 and satellites, which we expect to persist until 2025, when COGS will still represent 99% of revenues.⁵⁸ The easing of cost overruns in the BDS segment, as well as the introduction of new production lines in Everett and North Charleston, reaching full capacity in 2025, is expected to bring economies of scale, gradually improving production costs to 95% in 2027, maintaining that level until 2029. From this year onward, this ratio should decrease to 93%, reflecting further cost improvements. In 2033, these costs will reach \$134Bn. Looking into the cost of services provided, Boeing has historically kept it at an average of 53% of the revenues in the BGS segment and we anticipate no major changes to this ratio. The third component of costs and expenses is Boeing Capital’s interest expense, forecasted as a percentage of customer financing, set to maintain 2023’s levels for the following years. Over the period of analysis, COGS is expected to evolve from \$116Bn in 2023 to \$162Bn in 2033, corresponding to 86% and 82% of the revenues,

Exhibit 43: Boeing and Airbus Operating Margins (%)

Source: Boeing, Airbus



respectively, which is slightly above pre-crisis levels (81%). In terms of financial health, Boeing’s operating margins overperformed Airbus’ from 2014 to 2018. During this period, the European manufacturer faced significant charges related to its A400M military, with \$2.2Bn in charges in 2016, the lowest margin year of the analyzed period. However, starting in 2019, this dynamic shifted. Whereas Boeing was severely affected by the 737-Max grounding and fixed-price contractual agreements in its defense unit during high-inflation years, leading to operating margins to negative levels, Airbus was able to capitalize on the market’s unfulfilled demand and boost operating profitability to an 8-year record.

General and administrative, as well as research and development expenses, were forecasted as a percentage of revenues, aligning with the narrow variations for these drivers over the historical period and averaging 3% and 4%, respectively. The manufacturer is expected to continue with the development of new commercial and defense programs, such as the 777X, thus maintaining its significant investment in R&D. On the other hand, Depreciation and Amortization were calculated as a percentage of the Property, Plant and Equipment balance of the previous period. For the forecast period, it is assumed that this caption should be equal to the historical average of 18% given that it is not likely that Boeing will alter its asset structure in the future. All in all, operating costs are anticipated to amount to \$179.8Bn in the last year, resulting in a NOPLAT of \$16.1Bn.

Capital Expenditures

Boeing’s net capital expenditures in Property, Plant & Equipment (PP&E) declined from \$2.1Bn in 2018 to \$1.6Bn in 2022. This reduction is attributed to a production slowdown stemming from a combination of the mentioned internal and external factors, which did not require the company to invest as heavily in new equipment or buildings. Nevertheless, our projection indicates an increase in future capital commitments, notably in the BDS division, with a confirmed \$2Bn investment in Missouri to support new aerospace programs.⁵⁹ Both the BCA and BGS divisions will also require additional capital expenditures for additional production infrastructure, particularly for the start of the 777X model in 2025 and the 777-8 in 2027. Furthermore, the BGS segment will experience a significant increase of \$5.5Bn in its PP&E, primarily attributed to the implementation of larger distribution centers globally, as well as maintenance facilities to support the growing fleet of the BCA and BDS clients. In total, we forecast the company’s net capex expenditure to equal \$6Bn in the last forecasted year.

Acquired intangibles are projected to grow on average at 4% of revenues, reaching \$7.2Bn in 2033. This growth aligns with the company’s recent strategy focus on the software industry, exemplified by recent acquisitions such as CloudAhoj in 2023,

an addition specializing in flight operations and training software. This strategy is likely to continue, particularly with BGS playing an increasingly larger role in the company’s revenues (26% in 2022).

Net Working Capital

Boeing’s operating working capital is expected to evolve from \$4.6Bn in Q3 2023 to \$4.5Bn in 2033. Operating cash is projected to be 2% of revenue, whereas the remaining of cash and cash equivalents are categorized as excess cash. Accounts payable projections are based on the historical average days payable, excluding outlier years 2019 and 2020, indicating an average payment period to suppliers of 58 days in the future. In response to the accumulation of excess inventory between 2018 and 2023, the firm’s inventories are predicted to decrease in the short-run through an inventory depletion effect. This effect is set to happen mostly in 2024 (80% of excess inventory), decreasing 20% in overall inventory levels compared to 2023. From 2025 onward, given the expanded production capacity, inventories are forecasted to increase according to an inventory holding period of 325 days, calculated based on the cost of products and aligning with historical levels. The recent increase in accrued liabilities is attributed to accrued losses on fixed-price contractual obligations in the defense segment. A projected reduction of \$1.2Bn in Q4 is anticipated, given that the fixed-price accrued losses are expected to not be solved in the short term. Nevertheless, from 2025 onward the caption will reduce in size to 14% of revenues, equaling with levels observed in 2017.

Exhibit 44: Boeing and Airbus Average Days Payable
Source: Boeing, Airbus

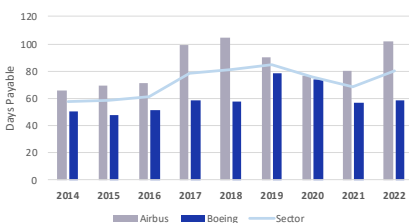


Exhibit 45: Valuation Inputs
Source: Own Analysis

Market Risk Premium	
Risk-free Rate	3.9%
Market Risk Premium	5.0%
Debt	
Yield to Maturity	6.3%
Statutory Tax Rate	21%
Debt-to-Equity Market Leverage	
Current D/E	34.8%
Target D/E	11.7%
Debt-to-Enterprise Value Market Leverage	
Current D/EV	25.8%
Target D/EV	10.5%
Growth rate	
Perpetuity Growth Rate	4.8%

Exhibit 46: Cost of Debt Calculation
Source: Own Analysis

Cost of Debt Estimation					
	2023	2024F	...	2032F	2033F
Yield to Maturity	6.3%	6.3%	...	6.3%	6.3%
Average Probability of Default (1981-2021)	3.1%	3.1%	...	3.1%	3.1%
Probability of Default	0.3%	0.3%	...	0.3%	0.3%
Recovery Rate	40.0%	40.0%	...	40.0%	40.0%
Loss Given Default	60.0%	60.0%	...	60.0%	60.0%
Cost of Debt	6.1%	6.1%	...	6.1%	6.1%
Beta Debt	0.44	0.44	...	0.44	0.44

The weighted average cost of capital (WACC) estimate maintained an average of 8.1% throughout the forecasted period, reflecting assumptions about a dynamic future capital structure. Boeing’s fair-value net debt-to-EV ratio rose substantially, escalating from 4.75% in 2018 to 26.64% in Q3 2023 due to the 737-Max grounding incident and the Covid-19 pandemic. With the normalization of activity, our forecasts indicate a gradual reduction of this ratio over the analyzed period, stabilizing at 10.5% in 2030.

The opportunity cost of debt was calculated using the yield to maturity of an unsecured company bond maturing in 2033, equivalent to 6.3%. This value was adjusted based on the cumulative 10-year average probability of default between 1981-2021 provided by S&P Global for companies with a BBB- rating, such as Boeing, equaling 3.1%. Considering a loss given default of 60% sourced from Moody’s annual default study on senior unsecured debt, this resulted in a cost of debt equal to 6.1% and an implied CAPM debt beta of 0.44.

Boeing’s levered cost of equity fluctuates with the changing capital structure, averaging 8.7% over the 10-year forecast. The United States 10-Year treasury yield, which is 3.9%, serves as the risk-free rate, chosen for its high credit rating and long-term maturity as a suitable proxy for a risk-free investment.

The market risk premium required by the CAPM relies on McKinsey’s analysis of data from 1962 to 2018 for the average inflation-adjusted stock market return and average inflation-adjusted U.S. treasury return, which concluded an estimated market risk premium of 5%.

To derive the OLS beta, we regressed the weekly stock market returns for Boeing and a set of comparable companies for the last 3 years (156 observations) against the S&P 500, on which we performed the Bloomberg adjustment to assume a reversion to the mean. To be able to compare the betas, we unlevered them at each company’s fair-value debt to equity ratios and performed both a total average and an average for only Boeing and Airbus. We opted to use the unlevered equity beta given by Boeing and Airbus’ average given that they have very similar business models, and therefore systematic risks, whereas any other competitor merely focuses on a specific industry such as defense. Subsequently, the betas were re-levered at each year’s target fair-value net-debt to equity ratio. The nominal perpetuity growth rate employed in the analysis is set at 4.8%, given by the product of the ROIC equal to 25% and the reinvestment rate of 19%, all of which achieve a steady state in the final forecasted years. Such perpetual rate aligns with the global nominal GDP growth rate projected by IMF of 4.9% in the long-term.

To assess Boeing’s value, we performed a discounted cash flow valuation by discounting Boeing’s expected free cash flows at the weighted average cost of capital. After accounting for the non-operating invested capital and deducting both the fair-value net financial debt and non-controlling interests, the implicit share price was calculated to be \$313. By deducting the expected transactions with shareholders of \$7 per share, the total investor return stands at 16% relative to the prevailing market price of \$264 per share, corresponding to a “buy” recommendation. To validate the solidity of our underlying assumptions, we also performed an Adjusted Present Value (APV) model by discounting the unlevered enterprise value at the unlevered cost of equity and calculating the value of the tax shields given the forecasted net financial debt. As expected, the levered EV and implied share price were identical.

Multiples Valuation

For the relative valuation, four different multiples were analyzed: EV/Revenue, Forward EV/EBITDA, Forward EV/EBIT, and Forward P/E.

Exhibit 47: Industry Equity Beta
Source: Own Analysis

Company Name	OLS Beta	Bloomberg Adj.	D/E	Debt Beta (Bd)	Unlevered Beta
The Boeing Company	1.25	1.17	0.34	0.44	0.30
Airbus	0.72	0.82	0.11	0.24	0.76
Lockheed Martin	0.52	0.68	0.16	0.30	0.62
Raytheon Technologies	0.77	0.85	0.22	0.42	0.77
General Dynamics Corp	0.73	0.82	0.16	0.30	0.75
Northrop Grumman Corp	0.43	0.62	0.21	0.31	0.57
L3Harris Technologies Inc	0.81	0.87	0.21	0.39	0.79
Total Average					0.75
Top 2 Average					0.87

Exhibit 48: WACC Calculation
Source: Own Analysis

	2023	2024F	...	2032F	2033F
Levered Cost of Equity	9.0%	8.9%	...	8.5%	8.5%
Pre-tax Cost of Debt	6.1%	6.1%	...	6.1%	6.1%
After-tax Cost of Debt	4.8%	4.8%	...	4.8%	4.8%
D/EV	25.0%	22.0%	...	10.5%	10.5%
E/EV	75.0%	78.0%	...	89.5%	89.5%
Tax Rate	21.0%	21.0%	...	21.0%	21.0%
WACC	8.0%	8.0%	...	8.1%	8.1%

Exhibit 49: DCF Outputs
Source: Own Analysis

Enterprise Value (2024)	244,776
Non-operating Invested Capital	(3,435)
Net Financial Debt	(53,851)
Equity	187,490
Non-controlling interests	22
Shareholder's Equity	187,468
# Shares Outstanding (Mn)	598
Implicit Share Price	313
Transactions with Shareholders (\$/Share)	7
Expected Total Return (\$/Share)	306
Current Price (Dec. 2023, \$/Share)	264
Expected Capital Gain (\$/Share)	42
Expected Total Return	16%

Exhibit 50: Industry Multiples
Source: Own Analysis

Company Name	EV/Revenue	Forward EV/EBITDA (24)	Forward EV/EBIT (24)	Forward P/E (24)
Boeing Co	3.0x	21.6x	27.6x	46.5x
Airbus SE	1.8x	11.1x	15.3x	20.9x
RTX Corp	2.0x	11.3x	14.4x	16.2x
Lockheed Martin Corp	1.8x	12.6x	14.8x	17.2x
General Dynamics Corp	1.9x	13.0x	15.2x	17.1x
Northrop Grumman Corp	2.1x	13.9x	17.9x	19.3x
L3Harris Technologies Inc	2.5x	11.5x	13.8x	15.7x
High	3.0x	21.6x	27.6x	46.5x
75th Percentile	2.7x	19.0x	24.5x	40.1x
Average	2.4x	16.3x	21.4x	33.7x
Median	2.4x	16.3x	21.4x	33.7x
25th Percentile	2.1x	13.7x	18.3x	27.3x
Low	1.8x	11.1x	15.3x	20.9x

Boeing exhibits higher valuation multiples compared to its direct comparable, Airbus. Specifically, Boeing’s Forward EV/EBITDA at 21.6x, and Forward EV/EBIT at 27.6x are substantially higher than Airbus’. This valuation discrepancy is grounded in the assumption that the American company is better suited to drive the high revenue growth into consistently high operating profit margins, akin to its past performance. Whereas Boeing averaged operating profit margins of 9% from 2014 to 2018 (the same rate we predict it to achieve by 2031), Airbus was only capable of achieving a 4% average operating margin throughout the same timeframe.

The same is evident in Boeing’s Forward P/E of 46.5x, more than double that of its peer, signaling that the market’s confidence in the company’s turnaround.

Sensitivity Analysis

When conducting a valuation of a company with considerable complexity like Boeing, there are multiple sources of uncertainty that can impact the firm’s intrinsic value and need to be addressed. In this case, the analysis focused on the variations in the perpetual growth rate (g), as well as in the WACC.

Exhibit 51: Sensitivity Analysis - Perpetual Growth Rate with Constant ROIC
Source: Own Analysis

	Perpetual Growth Rate			
	2.8%	3.8%	4.8%	5.8%
EV Perpetuity (t)	268,066	314,061	388,181	525,070
ROIC	25%	25%	25%	25%
NOPLAT	16,149	16,149	16,149	16,149
RR	11%	15%	19%	23%
Unlev. FCF (t+1)	14,373	13,698	13,049	12,401

As such, we start by assessing the impact of a different perpetual growth rate through its different components on the perpetuity cash flow. First, we simulated a variation of 1 percentage point in the perpetual growth rate, implying that it could range from 2.8% to 5.8%, given the original value of 4.8%. If the return on invested capital (ROIC) is kept constant at 25% and the variation comes from the reinvestment rate (RR), the perpetual cash flow ranges from \$14.3Bn to \$12.4Bn in the lower and higher end of the variation, respectively. Consequently, since the ROIC is larger than the WACC, the perpetuity EV should go from \$267.7Bn to \$525.1Bn as the RR rises, given that Boeing is creating value by investing more capital into its operations. Conversely, when keeping the RR fixed at 19% and introducing changes to the ROIC, the perpetual cash flow is projected to increase from \$7.6Bn for a 14% ROIC to \$15.8Bn when ROIC is 30%. The higher ROIC implies an increase in the NOPLAT, and given that the RR is constant, this leads to a rise in both the unlevered FCF and EV.

Exhibit 52: Sensitivity Analysis - Perpetual Growth Rate with Constant RR
Source: Own Analysis

	Perpetual Growth Rate			
	2.8%	3.8%	4.8%	5.8%
EV Perpetuity (t)	141,486	236,554	388,181	668,214
ROIC	14%	20%	25%	30%
NOPLAT	9,388	12,769	16,149	19,530
RR	19%	19%	19%	19%
Unlev. FCF (t+1)	7,586	10,318	13,049	15,781

Furthermore, a sensitivity analysis on the unlevered cost of equity was also conducted, considering the upper and lower bounds derived from the 95% confidence intervals of the regressed levered betas for both Airbus and Boeing. After unlevering the betas and computing the average, we applied them in the calculation of the WACC within the upper and lower bounds, establishing the range of fair doubt between 7.3% and 8.9%. When comparing the change in WACC with changes in the perpetuity growth rate, the results indicate a potential decrease in share price to \$226 in the most conservative scenario, contrasting with a maximum of \$600 per share in the most optimistic scenario.

Exhibit 53: Upper and Lower Bounds for Equity Beta (Airbus and Boeing Average)
Source: Own Analysis

Upper Bound	
Unlevered Equity Beta	1.03
Unlevered Cost of Equity	9.1%
Levered Cost of Equity	9.4%
WACC - Upper Bound	8.9%
Lower Bound	
Unlevered Equity Beta	0.71
Unlevered Cost of Equity	7%
Levered Cost of Equity	7.6%
WACC - Lower Bound	7.3%

Exhibit 54: Sensitivity Analysis – WACC
Source: Own Analysis

		Growth Rate in Perpetuity				
		3.8%	4.3%	4.8%	5.3%	5.8%
WACC	3.1%	299	337	391	470	600
	7.3%	281	313	357	420	516
	8.1%	256	281	313	357	420
	8.6%	236	256	281	313	357
	8.9%	226	244	265	293	330

Appendix

Financial Statements

Consolidated Statement of Financial Position

Consolidated Statements of Financial Position (\$Mn)		2017A	2018A	2019A	2020A	2021A	2022A	Q1 2023	Q2 2023	Q3 2023	Q4 2023	2023	2024F	2025F	2026F	2027F	2028F	2029F	2030F	2031F	2032F	2033F
Operating Invested Capital																						
Operating cash and bank balances		1,880	2,023	1,896	1,173	1,245	1,332	1,434	1,578	1,446	1,575	1,575	2,705	2,923	2,852	3,008	3,124	3,238	3,370	3,552	3,746	3,954
(% of Revenues)		2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Accounts receivable, net		2,894	3,879	3,266	1,955	2,611	2,517	2,862	2,945	3,032	3,392.8	3,392.6	7,113.9	7,641.9	7,379.8	7,766.0	8,087.5	8,424.0	8,789.2	9,835.2	9,283.7	10,416.3
Avg. days receivable		39.7	46.3	46.7	60.8	47.0	34.2	34.3	35.6	36.0	32.6	32.6	45.4	45.5	44.8	44.9	45.2	45.5	45.9	45.9	45.9	45.9
Unbilled receivables, net		8,194	10,025	9,043	7,995	8,620	8,634	9,689	9,357	9,184	9,995	9,995	15,922	17,206	16,791	17,706	18,393	19,060	19,843	20,910	22,054	23,279
(% of Revenues)		9%	10%	11%	14%	14%	13%	14%	12%	13%	13%	12%	12%	12%	12%	12%	12%	12%	12%	12%	12%	12%
Inventories		61,388	62,567	76,622	81,715	78,823	78,151	78,503	78,322	78,972	83,961	83,961	66,846	75,056	90,180	93,132	106,780	102,059	107,492	113,314	119,553	
Avg. Holding period		329	313	445	647	576	529	529	473	494	500	500	250	260	325	325	325	325	325	325	325	325
Turnover ratio		1.1	1.2	0.8	0.7	0.7	0.7	0.7	0.8	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
Current portion of customer financing, net Inventories		309	460	162	101	117	154	133	85	88	109	109	329	356	347	366	360	394	410	432	456	481
(% of Revenues)		0.3%	0.5%	0.2%	0.2%	0.2%	0.2%	0.2%	0.1%	0.1%	0.1%	0.1%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%
Operating Current Assets																						
Operating Current Assets		74,665	78,954	90,789	92,939	91,446	90,788	92,821	92,287	92,722	99,032	99,032	92,916	103,182	117,550	121,978	126,689	131,294	134,472	141,679	149,404	157,685
(12,202)		(12,916)	(15,553)	(12,928)	(9,281)	(10,200)	(10,274)	(10,936)	(11,143)	(11,465)	(11,465)	(18,576)	(20,074)	(19,322)	(20,025)	(20,799)	(21,550)	(22,041)	(23,222)	(24,487)	(25,844)	
Avg. days payable		58	58	79	74	57	59	59	58	60	58	58	58	58	58	58	58	58	58	58	58	58
Advances and progress billings		(48,042)	(50,676)	(51,551)	(50,488)	(52,980)	(53,081)	(54,498)	(55,310)	(55,924)	(55,123)	(55,123)	(50,000)	(60,000)	(71,458)	(75,356)	(78,276)	(81,119)	(84,540)	(88,991)	(93,857)	(99,074)
(% of Revenues)		51%	50%	61%	66%	65%	60%	76%	70%	77%	70%	70%	37%	41%	50%	50%	50%	50%	50%	50%	50%	50%
Accrued liabilities		(13,069)	(14,808)	(22,888)	(22,171)	(18,455)	(21,581)	(20,812)	(21,221)	(21,104)	(22,342)	(22,342)	(20,960)	(20,857)	(20,353)	(21,463)	(22,295)	(23,104)	(24,053)	(25,346)	(26,732)	(28,218)
(% of Revenues)		14%	15%	27%	26%	20%	23%	22%	23%	23%	23%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%
Operating Current Liabilities																						
Operating Current Liabilities		(73,313)	(78,400)	(89,272)	(85,587)	(80,868)	(84,862)	(85,584)	(87,467)	(88,171)	(88,929)	(88,929)	(89,536)	(100,931)	(111,133)	(116,844)	(121,370)	(125,774)	(130,544)	(137,559)	(145,073)	(153,136)
Operating Working Capital																						
Operating Working Capital		1,352	554	817	7,352	10,750	5,926	7,037	4,820	4,551	10,103	10,103	3,380	2,251	6,417	5,134	5,329	5,280	3,928	4,121	4,327	4,549
Property, plant and equipment, net		12,672	12,645	12,502	11,820	10,918	10,550	10,493	10,455	10,484	11,280	11,280	17,145	19,950	20,513	22,022	22,866	23,681	24,641	24,875	26,197	27,613
(% of Revenues)		13%	13%	13%	20%	18%	16%	15%	13%	14%	14%	14%	13%	14%	14%	15%	15%	15%	14%	14%	14%	14%
Other operating assets and liabilities, net		5,962	5,401	6,382	25,423	13,677	7,756	9,015	11,520	10,558	10,966	10,966	18,986	20,517	20,021	21,113	21,932	22,728	23,861	24,934	26,297	27,759
Short-term and other investments		1,179	927	545	17,838	8,192	2,606	3,955	6,508	6,561	5,995	5,995	8,901	9,619	9,387	9,889	10,262	10,656	11,093	11,690	12,329	13,014
(% of Revenues)		1%	1%	1%	30%	13%	4%	6%	6%	6%	6%	6%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%
Acquired intangible assets, net		2,573	3,429	3,338	2,843	2,562	2,311	2,254	2,194	2,143	2,333	2,333	4,918	5,314	5,186	5,469	5,681	5,887	6,129	6,459	6,812	7,190
(% of Revenues)		3%	3%	4%	5%	4%	3%	3%	3%	3%	3%	3%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Investments		1,260	1,087	1,092	1,016	975	983	969	1,025	1,061	1,081	1,081	1,903	2,056	2,006	2,116	2,198	2,278	2,371	2,499	2,635	2,782
(% of Revenues)		1%	1%	1%	2%	2%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Customer financing, net		2,756	2,418	2,136	1,936	1,695	1,450	1,372	1,105	963	1,219	1,219	3,399	3,673	3,584	3,779	3,926	4,068	4,235	4,463	4,707	4,969
(% of Revenues)		3%	2%	3%	3%	3%	2%	2%	1%	1%	2%	2%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Other current assets, net		2,417	2,335	3,106	4,296	2,221	2,847	2,857	2,941	2,287	2,855	2,855	5,277	5,702	5,565	5,868	6,096	6,317	6,578	6,930	7,309	7,715
(% of Revenues)		3%	2%	4%	7%	4%	4%	4%	4%	3%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Deferred income taxes - liabilities		(2,188)	(1,736)	(413)	(1,010)	(218)	(230)	(194)	(95)	(218)	(182)	(182)	(1,387)	(1,499)	(1,463)	(1,542)	(1,602)	(1,660)	(1,728)	(1,821)	(1,921)	(2,028)
(% of Revenues)		2%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Other long-term liabilities		(2,015)	(3,059)	(3,422)	(1,486)	(1,750)	(2,211)	(2,198)	(2,158)	(2,239)	(2,336)	(2,336)	(4,024)	(4,349)	(4,244)	(4,475)	(4,649)	(4,818)	(5,015)	(5,285)	(5,574)	(5,884)
(% of Revenues)		2%	3%	4%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Operating Invested Capital (excluding Goodwill)																						
Operating Invested Capital (excluding Goodwill)		20,006	18,600	19,701	44,955	35,345	24,322	26,545	26,795	25,593	32,349	32,349	39,511	42,719	46,952	48,269	50,127	51,929	51,390	53,293	56,821	59,921
Goodwill		5,559	7,840	8,080	8,081	8,068	8,057	8,063	8,061	8,069	8,069	8,069	8,069	8,069	8,069	8,069	8,069	8,069	8,069	8,069	8,069	8,069
(% of Revenues)		6%	8%	11%	14%	13%	12%	11%	10%	11%	11%	10%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%
Total Operating Assets		103,081	109,635	121,568	140,759	126,077	119,592	122,584	124,576	124,290	131,865	131,865	142,528	157,266	171,860	179,199	185,817	192,250	196,587	206,663	217,462	229,037
Total Operating Liabilities		(77,516)	(83,195)	(93,807)	(88,083)	(82,664)	(87,303)	(87,976)	(89,720)	(90,628)	(91,447)	(91,447)	(94,948)	(106,779)	(116,833)	(122,862)	(127,621)	(132,252)	(137,289)	(144,665)	(152,572)	(161,047)
Operating Invested Capital (including Goodwill)																						
Operating Invested Capital (including Goodwill)		25,565	26,440	27,781	52,676	43,413	32,289	34,608	34,856	33,662	40,418	40,418	47,580	50,788	55,021	56,338	58,196	59,998	59,299	61,998	64,890	67,990
Non-Operating Invested Capital																						
Other assets, net of accumulated amortization		2,027	1,826	3,585	4,712	5,591	4,163	4,320	4,456	4,552	4,562	4,562	4,562	4,562	4,562	4,562	4,562	4,562	4,562	4,562	4,562	4,562
Deferred income taxes - assets		321	284	683	86	77	63	65	66	64	64	64	101	101	101	101	101	101	101	101	101	101
(% of Accrued pension plans and retiree health care liabilities)		1%	1%	2%	0%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Accrued retiree health care		(5,545)	(4,584)	(4,540)	(4,137)	(3,528)	(2,503)	(2,466)	(2,424)	(2,385)	(2,385)	(2,385)	(2,385)	(2,385)	(2,385)	(2,385)	(2,385)	(2,385)	(2,385)	(2,385)	(2,385)	(2,385)
Accrued pension plan liability, net		(16,471)	(15,323)	(16,276)	(14,408)	(8,104)	(6,141)	(5,998)	(5,855)	(5,713)	(5,713)	(5,713)	(5,713)	(5,713)	(5,713)	(5,713)	(5,713)	(5,713)	(5,713)	(5,713)	(5,713)	(5,713)
Total Non-Operating Assets		2,348	2,110	4,298	4,798	5,668	4,226	4,385	4,522	4,626	4,626	4,626	4,663	4,663	4,663	4,663	4,663	4,663	4,663	4,663	4,663	4,663
Total Non-Operating Liabilities		(22,016)	(19,907)	(20,816)	(18,545)	(12,632)	(8,644)	(8,464)	(8,279)	(8,098)	(8,098)	(8,098)	(8,098)	(8,098)	(8,098)	(8,098)	(8,098)	(8,098)	(8,098)	(8,098)	(8,098)	(8,098)
Non-Operating Invested Capital																						

Consolidated Statement of Operations

Consolidated Statements of Operations (\$Mn)																						
Core Business	2017A	2018A	2019A	2020A	2021A	2022A	Q1 2023	Q2 2023	Q3 2023	Q4 2023	2023F	2024F	2025F	2026F	2027F	2028F	2029F	2030F	2031F	2032F	2033F	
Revenue	\$ 94,005	\$ 101,127	\$ 84,816	\$ 58,656	\$ 62,272	\$ 66,592	\$ 17,921	\$ 19,725	\$ 18,076	\$ 23,025	\$ 78,747	\$ 135,226	\$ 146,129	\$ 142,599	\$ 150,378	\$ 156,205	\$ 161,878	\$ 168,525	\$ 177,596	\$ 187,298	\$ 197,707	
Costs and expenses	(76,612)	(81,490)	(72,093)	(63,843)	(59,269)	(63,106)	(15,998)	(17,812)	(16,939)	(21,130)	(71,878)	(116,808)	(126,229)	(121,495)	(125,919)	(130,786)	(135,511)	(138,594)	(146,000)	(153,978)	(162,509)	
General and administrative expense	(2,048)	(2,413)	(1,638)	(2,571)	(2,013)	(2,208)	(847)	(830)	(576)	(759)	(3,012)	(4,105)	(4,436)	(4,320)	(4,565)	(4,742)	(4,915)	(5,116)	(5,391)	(5,686)	(6,002)	
Research and development expense, net	(3,179)	(3,269)	(3,219)	(2,476)	(2,249)	(2,852)	(741)	(797)	(958)	(884)	(3,380)	(5,093)	(5,503)	(5,370)	(5,663)	(5,883)	(6,096)	(6,347)	(6,605)	(6,934)	(7,334)	
EBITDA	12,166	13,955	7,868	(10,234)	(1,259)	(1,574)	335	286	397	253	477	9,220	9,961	11,404	14,230	14,794	15,355	16,467	20,169	21,299	22,511	
D&A	(2,047)	(2,154)	(2,271)	(2,246)	(2,144)	(1,979)	(457)	(456)	(467)	(459)	(1,839)	(1,997)	(3,035)	(3,531)	(3,631)	(3,898)	(4,047)	(4,191)	(4,184)	(4,403)	(4,637)	
EBIT	10,119	11,801	5,597	(12,480)	(3,403)	(3,553)	(122)	(170)	(864)	(207)	(1,363)	7,224	6,926	7,873	10,599	10,896	11,308	14,276	15,985	16,896	17,874	
Statutory tax expense	(3,541)	(2,478)	(1,174)	2,620	715	746	26	36	181	43	286	(1,516)	(1,454)	(1,652)	(2,224)	(2,287)	(2,373)	(2,996)	(3,355)	(3,546)	(3,751)	
Other adjustments	515	312	615	(2,158)	(276)	(989)	(33)	167	(769)	(29)	(664)	819	785	893	1,202	1,236	1,282	1,619	1,813	1,916	2,027	
NOPLAT	7,093	9,635	5,038	(12,018)	(2,964)	(3,776)	(129)	33	(1,452)	(192)	(1,741)	6,527	6,258	7,114	9,576	9,845	10,217	12,899	14,443	15,266	16,149	
Non-Core Business																						
Estimated potential concessions and other considerations to 737 MAX customers	-	-	(8,259)	(498)	14	16	-	26	28	12	66	(45)	-	-	-	-	-	-	-	-	-	
(Loss)/income from operating investments, net	204	111	(4)	9	210	(16)	(27)	44	28	60	105	105	114	111	117	121	126	131	138	146	154	
Gain on dispositions, net	21	75	691	202	277	6	-	1	-	0	1	259	302	310	333	346	358	358	376	396	418	
Other income, net	123	95	438	442	1,551	1,058	302	350	297	389	1,209	1,095	1,314	1,169	1,258	1,255	1,391	1,354	1,527	1,555	1,558	
Nonoperating Profit before income tax	348	278	(1,154)	160	1,052	1,064	275	391	353	452	1,471	1,406	1,590	1,567	1,658	1,722	1,785	1,843	1,941	2,047	2,160	
Statutory tax expense	(122)	(58)	1,497	(34)	(221)	(223)	(58)	(82)	(74)	95	(119)	295	334	329	348	362	375	387	407	430	453	
Other adjustments	1,373	981	534	1,854	(38)	(116)	-	-	-	64	64	159	180	178	188	195	202	209	220	232	245	
Other comprehensive income/(loss), net of tax	247	1,290	(1,070)	(960)	5,474	2,109	-	(67)	(91)	294	136	2,062	2,228	2,174	2,293	2,382	2,468	2,569	2,708	2,856	3,014	
Nonoperating Profit	1,846	2,491	-6,173	800	6,267	2,834	217	242	188	905	1,552	3,922	4,331	4,248	4,487	4,661	4,830	5,008	5,276	5,564	5,873	
Financing																						
Interest and debt expense	(360)	(475)	(722)	(2,156)	(2,682)	(2,533)	(649)	(621)	(589)	(421)	(2,280)	(3,966)	(3,778)	(3,666)	(3,527)	(3,295)	(3,037)	(2,743)	(2,494)	(2,610)	(2,732)	
Statutory tax expense	126	100	151	453	563	532	136	130	124	(88)	302	(832)	(793)	(769)	(740)	(691)	(637)	-	-	-	-	
Financing Profit	(234)	(375)	(571)	(1,703)	(2,119)	(2,001)	(513)	(491)	(465)	(510)	(1,978)	(4,799)	(4,570)	(4,435)	(4,288)	(3,986)	(3,675)	(2,743)	(2,494)	(2,610)	(2,732)	
Total Comprehensive Income	8,703	11,729	(1,747)	(12,921)	1,184	(2,944)	(425)	(216)	(1,729)	203	(2,167)	6,560	6,019	6,926	9,796	10,520	11,372	15,163	17,225	18,220	19,290	

Cash Flow Map

Cash Flow Map (\$Mn)																						
	2017A	2018A	2019A	2020A	2021A	2022A	Q1 2023	Q2 2023	Q3 2023	Q4 2023	2023F	2024F	2025F	2026F	2027F	2028F	2029F	2030F	2031F	2032F	2033F	
EBIT	10,119	11,801	5,597	(12,480)	(3,403)	(3,553)	(122)	(170)	(864)	(207)	(1,363)	7,224	6,926	7,873	10,599	10,896	11,308	14,276	15,985	16,896	17,874	
Statutory tax expense	(3,541)	(2,478)	(1,174)	2,620	715	746	26	36	181	43	286	(1,516)	(1,454)	(1,652)	(2,224)	(2,287)	(2,373)	(2,996)	(3,355)	(3,546)	(3,751)	
Other adjustments	515	312	615	(2,158)	(276)	(989)	(33)	167	(769)	(29)	(664)	819	785	893	1,202	1,236	1,282	1,619	1,813	1,916	2,027	
NOPLAT	7,093	9,635	5,038	(12,018)	(2,964)	(3,776)	(129)	33	(1,452)	(192)	(1,741)	6,527	6,258	7,114	9,576	9,845	10,217	12,899	14,443	15,266	16,149	
Depreciation and amortisation	2,047	2,154	2,271	2,246	2,144	1,979	457	456	467	459	1,839	1,997	3,035	3,531	3,631	3,898	4,047	4,191	4,184	4,403	4,637	
Gross free cash flow	9,140	11,789	7,309	(9,772)	(820)	(1,797)	328	489	(985)	267	99	8,523	9,293	10,645	13,207	13,743	14,264	17,900	18,627	19,669	20,786	
(-) Net Capex	-	(2,127)	(2,128)	(1,564)	(1,242)	(1,611)	(400)	(418)	(496)	(1,255)	(2,569)	(7,862)	(5,840)	(4,094)	(5,139)	(4,743)	(4,862)	(4,151)	(5,418)	(5,725)	(6,053)	
(-) Change in net working capital	799	(264)	(6,535)	(3,398)	4,825	(1,111)	2,217	269	(5,552)	(4,177)	6,723	1,128	(4,165)	1,283	(195)	(192)	1,592	(193)	(207)	(222)		
(-) Increase in other operating assets and liabilities - net	581	(981)	(19,041)	11,746	5,921	(1,259)	(2,505)	962	(408)	(3,210)	(8,020)	(1,531)	496	(1,092)	(818)	(796)	(933)	(1,272)	(1,363)	(1,462)		
(-) Increase in intangibles - goodwill	(2,281)	(220)	(21)	13	11	(6)	2	(8)	(8)	(12)	-	-	-	-	-	-	-	-	-	-		
Operating free cash flow	9,140	8,760	3,716	(6,933)	6,298	7,348	(2,448)	(216)	(258)	(6,948)	(9,870)	(636)	3,050	2,881	8,259	7,987	8,415	13,598	11,744	12,374	13,049	
Growth rate (%)	-	-	-58%	-	17%	-133%	-	-	-	-	-	-	-	-6%	187%	-3%	5%	62%	-14%	5%	5%	
Non-operating EBIT	348	278	(1,134)	160	1,052	1,064	275	391	353	452	1,471	1,406	1,590	1,567	1,658	1,722	1,785	1,843	1,941	2,047	2,160	
Statutory tax expense	(122)	(58)	1,497	(34)	(221)	(223)	(58)	(82)	(74)	95	(119)	295	334	329	348	362	375	387	407	430	453	
Other adjustments	1,373	981	534	1,854	(38)	(116)	-	-	-	64	64	159	180	178	188	195	202	209	220	232	245	
Other comprehensive income	247	1,290	(1,070)	(960)	5,474	2,109	-	(67)	(91)	294	136	2,062	2,228	2,174	2,293	2,382	2,468	2,569	2,708	2,856	3,014	
Non-operating PLAT	1,846	2,491	(6,173)	800	6,267	2,834	217	242	188	905	1,552	3,922	4,331	4,248	4,487	4,661	4,830	5,008	5,276	5,564	5,873	
(-) Change in non-operating assets and liabilities - net	(1,871)	(1,871)	(1,249)	(2,801)	(6,783)	(2,546)	(339)	(322)	(285)	0	(946)	(38)	-	-	-	-	-	-	-	-		
Non-operating free cash flow	(25)	620	(7,422)	(2,001)	(516)	288	(122)	(80)	(97)	906	607	3,885	4,331	4,248	4,487	4,661	4,830	5,008	5,276	5,564	5,873	
Free cash flow to firm	9,113	9,359	(3,747)	(8,933)	5,782	7,636	(2,570)	(296)	(355)	(6,043)	(9,263)	3,249	7,382	7,128	12,746	12,648	13,244	18,606	17,020	17,938	18,922	
Interest	(360)	(475)	(722)	(2,156)	(2,682)	(2,533)	(649)	(621)	(589)	(421)	(2,280)	(3,966)	(3,778)	(3,666)	(3,527)	(3,295)	(3,037)	(2,743)	(2,494)	(2,610)	(2,732)	
Tax shields	126	100	151	453	563	532	136	130	124	(88)	302	(832)	(793)	(769)	(740)	(691)	(637)	-	-	-	-	
Change in net financial debt	4,048	11,281	37,491	(5,709)	(7,577)	2,294	579	315	9,632	12,820	(2,688)	(1,594)	(1,974)	(3,314)	(3,674)	(4,191)	(3,555)	1,661	1,730	1,800		
Change in non-controlling interest	14	246	(76)	(88)	(118)	(11)	-	(12)	1	(22)	-	9	2	(1)	1	1	1	1	2	2		
Transactions with Shareholders	(13,046)	(7,209)	3,222	2,133	2,060	800	207	517	(3,081)	(1,557)	4,229	(1,219)	(719)	(5,166)	(4,989)	(5,380)	(12,308)	(16,189)	(17,059)	(17,992)		
Total FCF from investors	(9,359)	3,747	38,933	(5,782)	(7,636)	2,570	296	355	6,043	9,263	(3,249)	(7,382)	(7,128)	(12,746)	(12,648)	(13,244)	(18,606)	(17,020)	(17,938)	(18,922)		

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Buy	Expected total return (including expected capital gains and expected dividend yield) of more than 10% over a 12-month period.
Hold	Expected total return (including expected capital gains and expected dividend yield) between 0% and 10% over a 12-month period.
Sell	Expected negative total return (including expected capital gains and expected dividend yield) over a 12-month period.

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