



Equity Valuation of Deutsche Lufthansa AG

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Abstract

This dissertation provides a commercial, financial, and valuation analysis of Europe's leading airline group, Deutsche Lufthansa AG.

The core of the dissertation focuses on valuing Lufthansa using two intrinsic valuation approaches: the classic DCF method and the APV method, along with a relative valuation approach using trading multiples. The valuation is conducted as of May 31, 2024, yielding a target share price of EUR 9.41, representing a 38.18% premium over Lufthansa's share price on May 15. This valuation is premised on Lufthansa leveraging its leading market position to continue its recovery following the challenging pandemic years. The analysis concludes that Lufthansa is well-positioned across its three main business segments – passenger airlines, logistics, and MRO – with industry growth projections for all three segments indicating strong revenue potential. The critical challenge for Lufthansa will be maintaining cost control in a highly competitive market environment.

This analysis is compared with two equity research reports from Alpha Value and Barclays, which similarly present positive outlooks with target share prices of EUR 8.48 and EUR 9.08, respectively. These reports confirm the overall BUY recommendation derived from this dissertation.

The market currently undervalues Lufthansa's stock, likely due to recent headwinds, including significant strikes in early 2024. However, the positive long-term growth prospects underscore a substantial upside potential for investors.

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Resumo

Esta dissertação fornece uma análise comercial, financeira e de avaliação do principal grupo de companhias aéreas da Europa, Deutsche Lufthansa AG.

O núcleo da dissertação concentra-se na avaliação da Lufthansa utilizando duas abordagens de avaliação intrínseca: o método clássico de Fluxo de Caixa Descontado (DCF) e o método de Valor Presente Ajustado (APV), juntamente com uma abordagem de avaliação relativa usando múltiplos de mercado. A avaliação é conduzida com data de 31 de maio de 2024, resultando em um preço-alvo de EUR 9,41, representando um prêmio de 38,18% sobre o preço das ações da Lufthansa em 15 de maio. A análise conclui que a Lufthansa está bem posicionada em seus três principais segmentos de negócios – companhias aéreas de passageiros, logística e MRO – com projeções de crescimento indicando um forte potencial de receita. O desafio crítico será manter o controle de custos em um ambiente de mercado competitivo.

Esta análise é comparada com dois relatórios de pesquisa de ações da Alpha Value e Barclays, que apresentam perspectivas positivas com preços-alvo de EUR 8,48 e EUR 9,08, respectivamente. Esses relatórios confirmam a recomendação geral de COMPRA derivada desta dissertação.

Atualmente, o mercado subestima as ações da Lufthansa, provavelmente devido aos recentes obstáculos, incluindo greves em 2024. No entanto, as perspectivas de crescimento positivo a longo prazo sublinham um potencial de valorização substancial para os investidores.

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Título: Valorização Patrimonial da Lufthansa AG

Palavras-Chave: Lufthansa, Companhias aéreas de passageiros, Carga aérea, Manutenção, Reparo e Revisão (MRO), Avaliação patrimonial, avaliação da empresa, Fluxo de caixa descontado, Valor presente ajustado, Avaliação relativa

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Abbreviations

APV	Adjusted Present Value
Bn	Billion
CAGR	Compounded Annual Growth Rate
CAPEX	Capital Expenditures
CAPM	Capital Asset Pricing Model
CCA	Comparable Companies Analysis
CTA	Comparable Transactions Analysis
D&A	Depreciation & Amortization
D/E	Debt to Equity
DCF	Discounted Cash Flow
DDM	Dividend Discount Model
EBIT	Earnings before Interest & Taxes
EBITDA	Earnings before Interest, Taxes, Depreciation & Amortization
EBT	Earnings before Taxes
ECB	European Central Bank
EUR	Euro
EV	Enterprise Value
FCFE	Free Cash Flow to Equity
FCFF	Free Cash Flow to Firm
FY	Fiscal Year
GDP	Gross Domestic Product
IFRS	International Financial Reporting Standards
ITS	Interest Tax Shield
Mm	Million
MV	Market Value
OECD	Organization for Economic Cooperation and Development
OEM	Original Equipment Manufacturer
OPEX	Operating Expenses
OWC	Operating Working Capital
P/E	Price to Earnings
PD	Probability of Default
PP&E	Property, Plant & Equipment

PV	Present Value
ROE	Return on Equity
Tn	Trillion
TV	Terminal Value
WACC	Weighted Average Cost of Capital

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1 Introduction

The domain of equity valuation occupies a central place in financial literature, reflecting its pivotal role in various areas of finance, such as corporate finance, mergers and acquisitions, and portfolio management (Damodaran, 2012). Fundamentally, equity valuation is the process of determining the true value of a company's shares. There exists a wide range of valuation approaches and models, each with its theoretical underpinnings and practical applications. These models, while often quantitative in nature, inherently rely on assumptions about future performance, risk, and market conditions. Thus, the validity and reliability of valuation models are intimately connected to the quality of inputs (Damodaran, 2012). This dependency underscores the importance for a thorough approach in the selection and testing of each assumption, to ensure that valuation models reflect realistic scenarios and outcomes.

However, even the most carefully formulated assumptions are vulnerable to disruption by unforeseen global events, such as the outbreak of the COVID-19 pandemic. The travel sector, particularly air travel, has been most affected by the pandemic, with Deutsche Lufthansa AG, the leading European airline group, being one of the most severely impacted companies. The imposition of travel restrictions in response to the pandemic, and their profound effects on the airline industry, underpin some of the difficulties at hand when applying traditional valuation models during times of economic and financial instability. Confronted with multibillion euros of liabilities related to trade payables and refunds for cancelled tickets, along with upcoming financial repayments and limited opportunities for market-based borrowing, Lufthansa entered into intensive negotiations with the governments of its home countries. These discussions have resulted in a stabilization package of EUR 9bn from the Federal Economic Stabilization Fund (WSF), which was approved on May 25, 2020 (Deutsche Lufthansa AG, 2020). This level of financial support not only reaffirms the airline's indispensable role in the national economy but also exemplifies the significant influence of external factors on valuation outcomes.

The choice of Lufthansa for this study is motivated by its historical and economic importance and pioneering role the airline has taken in the aviation industry, along with recent challenges it has faced during the pandemic. Against this background, this study aims to navigate the complexities surrounding equity valuation by reviewing the literature on techniques for equity valuation and applying some of these methodologies to Lufthansa. This study will review and contrast those outcomes with two existing analyst reports, thereby shedding light on the

nuances and challenges inherent in equity valuation. The final objective will be to determine a share price for Lufthansa, allowing an informed recommendation for investment.

2 Literature Review

There is extensive research on various valuation methods. Damodaran (2012) categorizes valuation methods in four main categories: Discounted cash-flow (DCF), relative valuation, asset-based valuation and contingent claim models. This chapter aims to provide an overview of the most relevant models, which are frequently analyzed by researchers and widely used by practitioners. A particular focus will be on DCF and relative valuation models.

2.1 Discounted Cash Flow Models

Discounted cash flow models are widely used among practitioners and are regarded as the only conceptually correct valuation method (Fernandez, 2023). These models focus on determining the intrinsic value of a firm by estimating its expected future cash flows and discounting them at a rate that accounts for the related risk (Fernandez, 2023; Damodaran, 2012). While dividends are the cash flows actually distributed to investors, free cash flow models consider the cash flows available for distribution instead. There are two distinct approaches to valuation using free cash flows, the free cash flow to firm (FCFF) and the free cash flow to equity (FCFE) (Stowe, et al., 2007; Damodaran, 2012). The FCFF represents the cash flow available to all capital suppliers, and when discounted at the weighted average cost of capital (WACC), it provides the total value of the firm. To determine the equity value, one must subtract the market value of debt and add back any excess cash. Conversely, the FCFE, when discounted at the required rate of return on equity (cost of equity), directly yields the equity value of the firm. When using a DCF, analysts typically forecast free cash flows in detail for an explicit period, often 5-10 years, followed by estimating a terminal value (TV) to represent the long-term steady state of the business.

$$Firm\ value = \sum_{t=1}^{t=n} \frac{CF_t}{(1+k_c)^t} + \frac{Terminal\ value_n}{(1+k_c)^n} \quad (1)$$

Where:

CF_t = Cash Flow in period t

k_c = Cash Flow Cost of Capital

2.1.1 Free Cash Flow to Firm (FCFF)

Free cash flow to the firm represents the total cash flows available to all stakeholders in the firm, including common stockholders, bondholders, and preferred stockholders. There are two primary approaches to calculating FCFF. The first approach sums the cash flows to all stakeholders, which includes cash flows to equity, lenders, and preferred stockholders. The second, more common approach, calculates cash flows before any of these claims are paid (Damodaran, 2012).

$$FCFF = EBIT(1 - \tau) + Depreciation - CapEx - \Delta NWC \quad (2)$$

Where:

FCFF	= Free Cash Flow to Firm
EBIT	= Earnings before Interest and Taxes
τ	= tax rate
CapEx	= Capital Expenditures
NWC	= Net Working Capital

This FCFF calculation excludes any tax benefits arising from interest payments, as these benefits are already accounted for in the after-tax cost of debt used in the cost of capital to discount FCFFs.

Terminal Value

In DCF valuation, a terminal value is calculated to account for the value of the firm beyond the explicit forecast period, as it is not possible to forecast cash flows forever. This terminal value reflects the firm's long-term, steady-state value. There are three approaches to compute the terminal value. The first assumes liquidation of the firm's assets in the terminal value year. The other two are going concern approaches. One applies an exit multiple while the other assumes that cash flows will grow at a stable rate to infinity. In the latter case, a perpetual growth model is used.

Terminal Value estimation in general terms:

$$Terminal\ Value_t = \frac{Cash\ Flow_{t+1}}{(r - Stable\ Growth)} \quad (3)$$

If used to value the firm:

$$Terminal\ Value_n = \frac{FCFF_{n+1}}{(Cost\ of\ capital_{n+1} - g_n)} \quad (4)$$

When the multiple approach is used, the firm's value in a future year is estimated by applying a multiple of a financial metric, typically EBITDA, EBIT or revenues. While using exit multiples is a straightforward method, it mixes up elements of relative valuation with the intrinsic valuation inherent in the discounted cash flow model (Damodaran, 2012).

Weighted Average Cost of Capital (WACC)

To determine the value of a firm as a whole using FCFFs in a discounted cash flow model, the cash flows are discounted using the weighted average cost of capital (WACC). This is because the WACC represents the return investors require for providing capital to the company, reflecting the risk associated with its cash flows. It is calculated by averaging the after-tax required returns for debt and equity holders, weighted according to their respective market value proportions in the firm's capital structure (Stowe et al., 2007).

$$WACC = \frac{MV(Debt)}{MV(Debt) + MV(Equity)} r_d(1 - \tau) + \frac{MV(Equity)}{MV(Debt) + MV(Equity)} r_e \quad (5)$$

Where:

MV(Debt) = Market value of Debt

MV(Equity) = Market value of Equity

τ = Tax rate

r_d = Required rate of return for debt holders

r_e = Required rate of return for equity holders

Cost of Equity

The cost of equity represents the return that investors demand for an equity investment in a firm and is a crucial component in the calculation of a firm's WACC. Among the various methods to estimate the cost of equity, the Capital Asset Pricing Model (CAPM), introduced by William Sharpe in 1964, is a well-established approach (Damodaran, 2012). This model relies on only a single firm-specific input and calculates the cost of equity as the risk-free rate plus the equity beta times the market risk premium.

$$E(R_i) = R_f + \beta_i [E(R_m) - R_f] \quad (6)$$

Where:

$E(R_i)$	= Expected Return on asset i
R_f	= Risk-free rate
β_i	= Beta of asset i
$E(R_m)$	= Expected Return on market portfolio

For the risk-free rate, long-term government bonds are commonly used as a proxy due to their low default risk. The expected market return can be either estimated through historical returns by looking at the average return that has been achieved by the market over a past period, or through implied market returns, which are derived from current market prices (Damodaran, 2012). The beta factor measures the sensitivity of a stock's return relative to the overall market returns, indicating the level of systematic risk associated with the stock. Beta factors can be computed from historical returns using regression analysis, where a stock's past returns are regressed against market returns. The following formula represents the slope of the regression and corresponds the beta of the stock.

$$\beta_i = \frac{Cov(R_i, R_m)}{\sigma_m^2} \quad (7)$$

Where:

R_i	= Return of stock i
R_m	= Return of market
σ_m^2	= Variance of market returns

If a company has limited historical data or is not publicly traded, beta can alternatively be estimated using the average beta of similar companies within the same industry (Damodaran, 2012). However, researchers argue that the CAPM beta incompletely describes risk, as multiple factors can drive returns in many markets. Despite the criticisms, the CAPM remains the most widely used method in practice due to its simplicity and familiarity (Stowe et al., 2007).

Cost of Debt

The cost of debt is the second component of the WACC. It reflects the current expenses a firm incurs to borrow funds. The cost of debt is influenced by the risk-free rate, the default risk and associated default spread, and the tax benefits that arise from interest deductibility (Damodaran, 2012).

To compute the cost of debt, several approaches can be used. In the simplest scenario, a firm has frequently traded long-term bonds outstanding, the yield on these bonds can be used as the cost of debt. If the firm's bonds are not liquid, the company's credit rating and the associated default spreads can be used to estimate cost of debt.

If the firm however has no rating at all one can estimate a synthetic rating using financial ratios such as interest coverage ratio or debt-to-equity ratio. The synthetic rating helps to determine an appropriate default spread. Finally, another approach in case a firm has no rating is to look at the borrowing history of the firm and use its historical cost of borrowing as an estimate of the current cost of debt (Damodaran, 2012).

2.1.2 Adjusted Present Value (APV)

The Adjusted Present Value (APV) model values a firm as if it were all-equity financed and then adds or subtracts the present value of additional cash flows associated with borrowing (Myers, 1974). The APV methodology addresses the limitations of traditional DCF models that use a single WACC and assume a constant debt-to-equity ratio over time. In reality, debt ratios change, impacting tax shield benefits and costs associated with financial distress. By separating a firm's value into its base value and the value of financing effects, the APV method more accurately captures the impact of financing decisions, resulting in a more precise valuation.

To determine the value of the levered firm, the following formula is applied:

$$V_L = V_U + PV(\text{Interest Tax Shield}) - PV(\text{Financial Distress Cost}) \quad (8)$$

Where:

V_L = Value of levered firm
 V_U = Value of unlevered firm

The value of the unlevered firm can be estimated by discounting the free cash flows at the unlevered cost of equity. The primary benefit of borrowing is the tax shield on interest payments, which increases firm value and is therefore added to V_U . This benefit depends on the tax rate and interest payments, discounted at the cost of debt. Conversely, the most significant cost is the increased risk of bankruptcy when adding leverage to a firm, which is consequently subtracted from V_U . Bankruptcy costs include direct costs, such as legal, accounting, filing and other administrative costs, as well as indirect costs, such as the lost profits that a firm can expect due to significant bankruptcy potential (Altman, 1984). However, a significant shortcoming of the APV approach is the lack of accuracy in estimating default probability and associated bankruptcy cost of a company, since they cannot be estimated directly (Damodaran, 2012).

2.1.3 Dividend Discount Model (DDM)

Another fundamental cash flow method for valuing stocks is the dividend discount model (DDM), based on the concept that a stock's value is the present value of its expected future dividends. Despite being seen as outdated by many analysts, the DDM's principles are central to discounted cash flow valuation (Damodaran, 2012). When buying stock, investors look for two main cash flows, dividends received during the holding period and the expected sale price of the stock. Since the anticipated sale price is based on future dividends, the value of a stock is the present value of an infinite series of dividends.

$$\text{Value per share of stock} = \sum_{t=1}^{t=\infty} \frac{E(DPS_t)}{(1 + k_e)^t} \quad (9)$$

Where:

$E(DPS_t)$ = Expected dividend per share in period t
 k_e = Cost of equity

Since forecasting dividends per share to infinity is not feasible, multiple versions of the dividend discount model have been developed (Damodaran, 2012). For the sake of a brief overview of dividend discount models, the two most prominent versions are presented below: the Gordon growth model and the two-stage dividend discount model.

The most straightforward form of the dividend discount model is the Gordon growth model. This model is used to value firms in a “steady state”, where dividends are assumed to grow at a constant rate to infinity. The model relates the value of a stock to the expected dividend in the next period, the cost of equity and the expected growth rate in dividends. It is important to acknowledge that this model will undervalue companies that consistently distribute fewer dividends than possible, thereby accumulating cash (Damodaran, 2012).

The two-stage dividend discount model presents an alternative approach to the Gordon growth model, accommodating two phases of growth, an initial phase where the growth rate is not stable followed by a phase of stable growth. Despite offering greater flexibility than the Gordon growth model, the two-stage model has its limitations. Estimating the exact duration of high growth can be challenging, and the transition to stable growth is usually gradual rather than abrupt (Damodaran, 2012).

2.2 Relative Valuation

Relative valuation methodologies, unlike intrinsic valuation methods, determine the value of an asset by comparing it to similar assets currently priced in the market (Damodaran, 2012). Relative valuation is widely used in practice, with many equity research reports and acquisition valuations relying on comparisons to comparable firms (Bancel & Mitto, 2014; Damodaran, 2012). Relative valuation is popular for several reasons. It requires fewer assumptions and is faster to complete than intrinsic valuation methods. It is also simpler and more intuitive, making it easier to present to clients. Additionally, it reflects current market sentiment by measuring relative rather than intrinsic value (Damodaran, 2012).

However, relative valuation has shortcomings. Gathering accurate multiples and selecting a suitable peer group can be challenging, leading to inconsistent estimates. Since multiples reflect market mood, asset values can be skewed if the market overvalues or undervalues comparable firms. Additionally, it lacks transparency in its assumptions, making it vulnerable to manipulation.

According to Damodaran (2012), to value assets on a relative basis, prices must be standardized, typically by converting them into multiples of either earnings, sales, book values, or in some cases, business-specific measures. In addition, comparable companies must be selected carefully with similar characteristics in terms of risk, growth potential, and cash flows.

Earnings multiples are widely used in relative valuation and can be categorized into equity multiples, like the price-earnings (P/E) and price-earnings to growth (PEG) ratios, and enterprise multiples, such as EV/EBITDA and EV/EBIT. EV/EBITDA is often preferred as it excludes the effects of different depreciation methods. Sales or revenue multiples, like EV/Sales and P/S, are useful for young or troubled firms with negative earnings. Book value multiples, such as price-to-book (P/B) ratio, offer a stable measure of value and can be used for firms with negative earnings.

2.3 Other Valuation Methods

There are many other valuation methods available. Some of these will be briefly discussed in the next section.

2.3.1 Balance Sheet-based Valuation

Balance sheet-based valuation aims to determine a firm's value by assessing the value of its assets. The fundamental assumption of these methods is that a company's value is accurately reflected in its balance sheet. However, this approach is inherently static, as it does not account for the potential evolution of the company. Additionally, it fails to consider other factors not reflected in accounting statements, such as valuable contracts, human resources, or the industry's current situation (Fernandez, 2013). Among the balance sheet-based valuation methods, book value, liquidation value, and replacement cost approach will be briefly discussed.

The book value represents the value of shareholders' equity as stated in the balance sheet, defined as the difference between a company's total assets and liabilities. A major drawback of this approach is that accounting criteria involves a certain level of subjectivity and differs from market criteria, which causes book value to almost never align with market value (Fernandez, 2023).

Liquidation value assumes that the firm ceases operations immediately and its assets are sold, and debts are paid off (Damodaran, 2012; Fernandez, 2023). The value is calculated by deducting liquidation expenses from the total value of assets less liabilities. Liquidation value represents company's minimum value as the value going concern is typically higher than the liquidation value.

The replacement value or replacement cost approach estimates the investment required to recreate the company under identical conditions. This approach assumes the company continues its operations and is particularly useful in industries where asset values significantly impact the overall company value (Fernandez, 2023).

2.3.2 Contingent Claim Valuation

Damodaran (2012) describes the growing acceptance that an asset's value may exceed the present value of its cash flows if those cash flows are contingent on the occurrence or non-occurrence of a certain event. This principle forms the foundation of contingent claim valuation models. Assets with option-like characteristics, such as patents or undeveloped natural resource reserves, can be valued using option pricing models. While this valuation approach uniquely incorporates potential contingencies, it has several limitations. For non-publicly traded companies, the required inputs for this model must be estimated, which can lead to significant errors. Additionally, the model assumes constant variance and dividend yields, which is unrealistic for options with long lifetimes (Damodaran, 2012).

2.3.3 Sum-of-the-parts

Sum-of-the-parts (SOTP) valuation method values each distinct business unit of a company separately and then adds them together to determine the total firm value. This method is particularly useful for conglomerates or companies with diverse business segments, each subject to different economic forces and risks, which require different discount rates (Brotherson et al., 2014). While most financial advisors typically value the entire enterprise collectively, they often prepare a SOTP valuation when specific risks or other considerations make it necessary. It is important to note that obtaining the necessary financial data for a proper SOTP valuation can be challenging, as most firms report financial data only for the entire company (Brotherson et al., 2014).

2.4 Choice of Valuation Methods

According to Bancel and Mittoo (2014), the most popular valuation methods that are used by practitioners are relative valuation and DCF using FCFF. In terms of relative valuation, the most used multiples are EV/EBITDA, price-to-earnings (P/E) and price-to-book (P/B). Additionally, their study reveals that most experts use two valuation methods in practice.

In this thesis, Lufthansa will be evaluated using three valuation methods: a DCF valuation using FCFF, an APV approach, and a relative valuation. The DCF method is appropriate for Lufthansa, given its mature state, proven capability of generating stable cash flows over time, and a well-established business model that supports the assumption of perpetual operation. The APV approach is included due to Lufthansa's significant debt, allowing for a separate valuation of the firm's base value and the value of financing effects. The relative valuation method will validate the DCF results, leveraging the availability of comparable publicly listed airlines in the industry. The results will be benchmarked against two professional valuation reports employing the same methods, ensuring a robust comparison.

3 Company Analysis

The following chapter aims to introduce Lufthansa by exploring its business operations, revenue streams, and strategic direction. This analysis will enhance the understanding of the company, providing a solid foundation for a thorough valuation.

3.1 Overview

The Lufthansa Group (hereafter referred to as "Lufthansa" or "the Group") is the leading European airline group with operations worldwide that was founded in 1953 and is headquartered in Cologne, Germany. The company ranks among the world's largest airline groups, providing a vast route network that spans all continents. It operates 4,000 daily flights, connecting passengers to over 300 destinations in around 100 countries. Beyond its own extensive route network, Lufthansa enhances its global reach and benefits to customers through the Star Alliance network. The Star Alliance network, founded in 1997 by Lufthansa, Air Canada, SAS, Thai Airways International and United Airlines, now offers flights to over 1,250 airports in 195 countries. By the end of 2023, Lufthansa employed a workforce of 96,677 people and maintained a fleet of 721 aircraft (Deutsche Lufthansa AG, 2024).

3.2 The Share & Ownership Structure

Since 1966, the Lufthansa share has been traded on various German stock exchanges, as well as on the electronic platform XETRA. It is part of the MDAX index and is listed in the Prime Standard segment of the German Stock Exchange. Under the German Aviation Compliance Documentation Act, Lufthansa must ensure most of its shares are held by German investors to maintain its international air traffic rights and operating license. As of December 2023, 73.4% of shareholders were German investors, with the next largest group being US investors at 10.4%. 54% of shares were held by institutional investors and the remaining 46% were held by private individuals. The free float of the Lufthansa shares is 84.99%. Over the past decade, the share price has fluctuated significantly, peaking at EUR 22.21 in December 2017, before declining to its lowest point of EUR 5.03 in September 2020 during the pandemic. The average share price over the past 10 years was EUR 10.01.

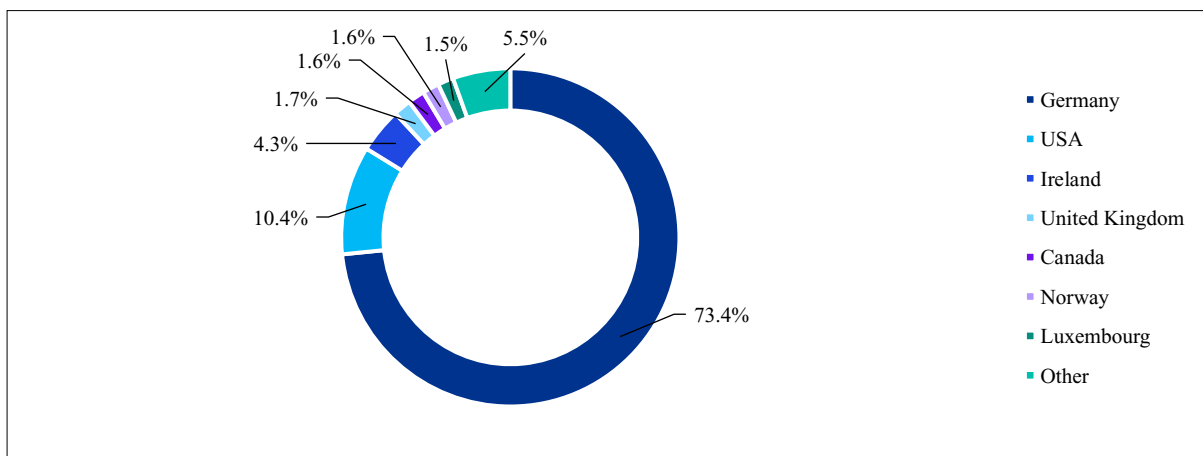


Figure 1: Shareholder Structure by Nationality as of Dec 31, 2023

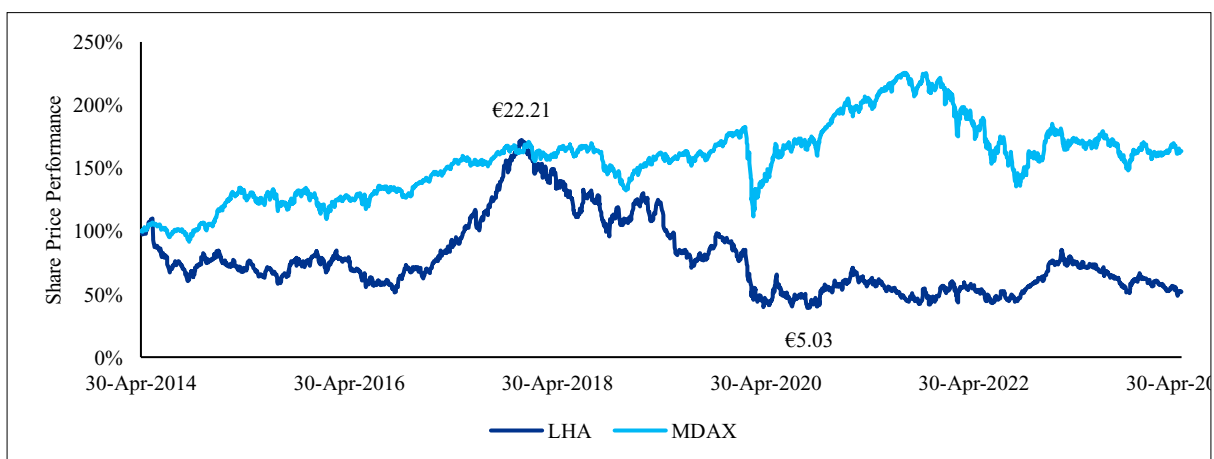


Figure 2: Share Price Performance of Lufthansa and MDAX, indexed as of Apr 30, 2014

3.3 Organizational Structure

The Lufthansa Group, which includes more than 300 subsidiaries and affiliated companies operates three main business segments including Passenger Airlines, Logistics, and MRO, as well as Additional Business and Group Functions. The former Catering segment, LSG Group, was sold to private equity investor Aurelius in the third quarter of the fiscal year 2023. Passenger Airlines is by far the largest segment, accounting for 78% of external revenue, followed by MRO at 13%, Logistics at 8%, and Additional Business and Group Functions at 1%. The latter segment includes Lufthansa Aviation Training and Lufthansa Systems, along with the Group's service and financial companies, and the administrative functions for the Lufthansa Group.

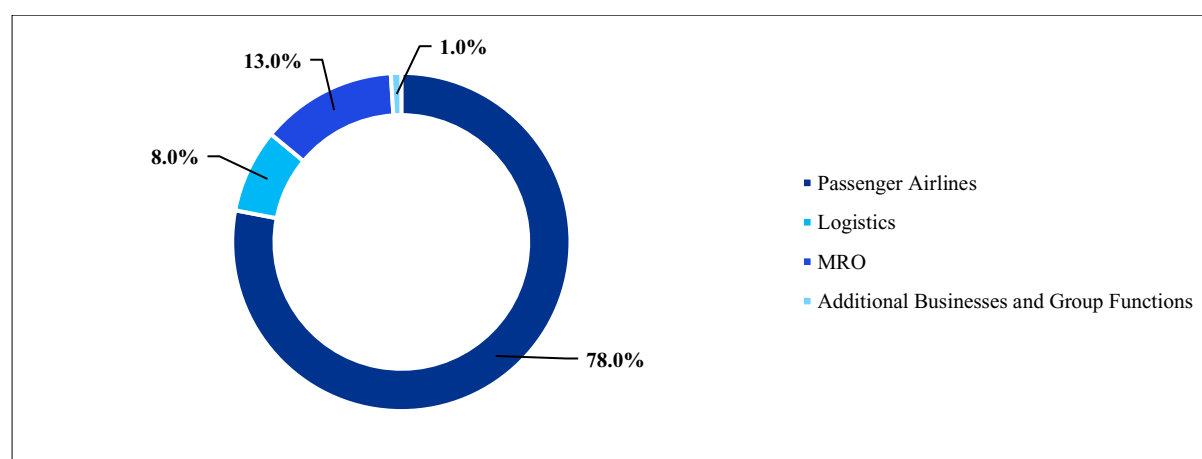


Figure 3: Business Segment's Share of Group external Revenue in 2023

3.4 Historical Financial & Operational Performance

Appendix 1 provides a detailed summary of Lufthansa's key financial and operational performance over the past decade. Historically, Lufthansa experienced strong growth, with rising revenues, EBITDA, and net profit from 2014 to end of 2017. During this period, EBITDA and EBIT margins also saw significant improvements. However, 2018 and 2019 presented a challenging environment for the airline industry due to higher fuel prices and global political and economic uncertainties. These factors led to increased operating expenses and a decline in earnings. The situation worsened dramatically with the outbreak of the COVID-19 pandemic in 2020, which caused a severe drop in revenues and resulted in negative earnings.

As of 2021, the situation began to recover gradually. Revenues started to increase, and earnings showed signs of improvement. By 2022, Lufthansa achieved a positive financial result again. The recovery continued in 2023, with revenues almost returning to pre-crisis levels and

earnings surpassing those of 2019. Other balance sheet ratios and cash flow figures followed a similar trend, with strong performance from 2014 to 2017, difficulties in 2018 and 2019, followed by the pandemic and subsequent recovery. Traffic figures present a mixed picture. Cargo traffic followed the general financial trend pre-pandemic, while passenger traffic remained strong in 2018 and 2019, with increasing flights, passengers, and load factors until the abrupt decline in 2020. Passenger traffic began to recover in 2021.

The adj. EBIT figures before, during and after the pandemic underscore the importance of Lufthansa's diverse business segments. This data reveals that while the Passenger Airlines segment was highly profitable before the pandemic, it experienced significant losses during the crisis. Conversely, the Logistics segment exhibited remarkable performance from 2020 to 2022. By 2022, the situation for Passenger Airlines had improved, and by 2023, all business segments reported positive adj. EBIT once again.

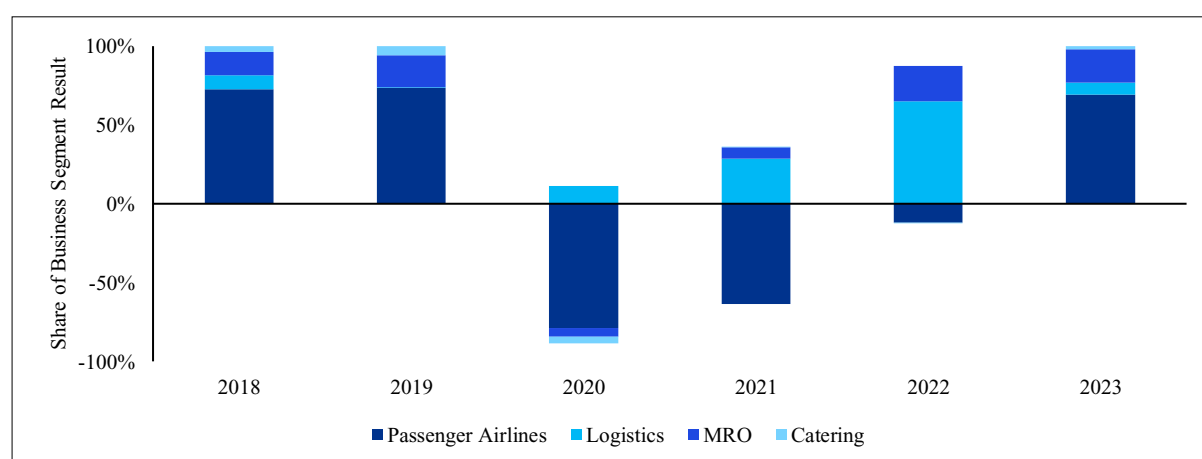


Figure 4: Lufthansa adj. EBIT Share of Business Segment over time

3.5 Business Segments

This section will examine the three main business segments of Lufthansa in detail.

3.5.1 Passenger Airlines

The Passenger Airlines segment forms the core of the Group, comprising Lufthansa Airlines, SWISS, Austrian Airlines, Brussels Airlines and Eurowings. The network carriers Lufthansa Airlines, SWISS, Austrian Airlines and Brussels Airlines provide customers with a premium experience through high-quality products and services. The network carriers implement a multi-hub strategy, providing passengers with a wide range of flights from their international hubs in Frankfurt, Munich and Zurich as well as their national hubs in Vienna and Brussels, ensuring maximum flexibility. In contrast, Eurowings operates as a value carrier with a point-

to-point strategy, providing an extensive range of direct flights to short- and medium-haul European destinations, particularly from German-speaking countries. The passenger Airlines segment also encompasses the regional airlines Lufthansa CityLine, Lufthansa City Airlines, Air Dolomiti, Edelweiss Air, Discover Airlines and the equity investment in SunExpress, the joint venture with Turkish Airlines. Additionally, commercial partnerships with leading international airlines further expand the Passenger Airlines route network.

In 2023, the performance of the Passenger Airlines segment saw considerable improvement over the previous year, driven by a sustained rise in air travel demand and higher yields. The capacity, measured in available seat-kilometers (ASK) in 2023 reached 84% of the levels seen before the crisis. Flight numbers rose by 15% compared to the previous year, with the total number of passengers transported reaching 122.5m, a 20% increase from the year before. Additionally, the passenger load factor rose by 3.1 percentage points to 82.9%, while passenger yields saw a 5.7% improvement.

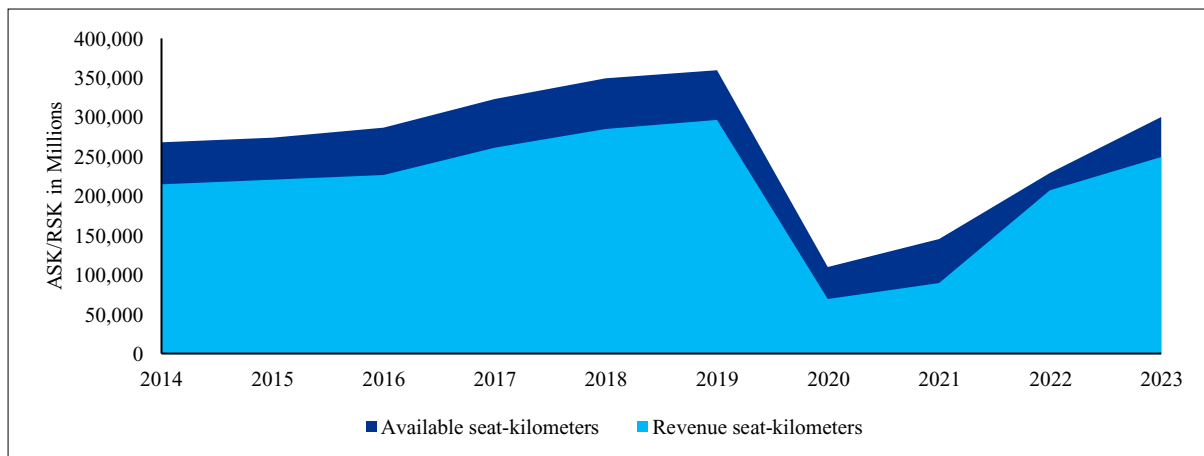


Figure 5: ASK vs. RSK

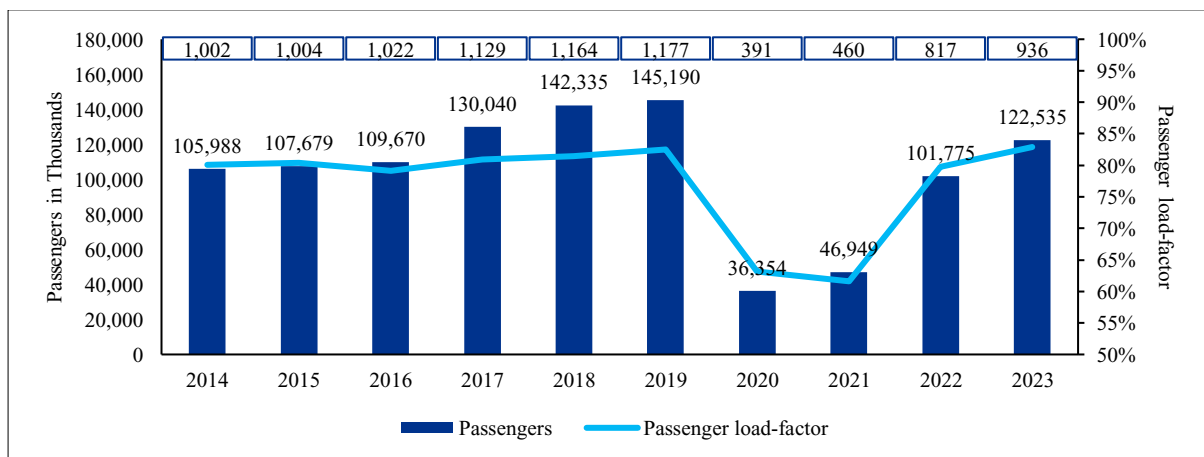


Figure 6: Number of Passengers, Number of Flights (in blue boxes, in thousands), Passenger Load Factor

Revenue in the Passenger Airlines business segment was up by 25% to EUR 28,337m, of which EUR 26,701m (+29%) was attributed to traffic revenue (Deutsche Lufthansa AG, 2024).

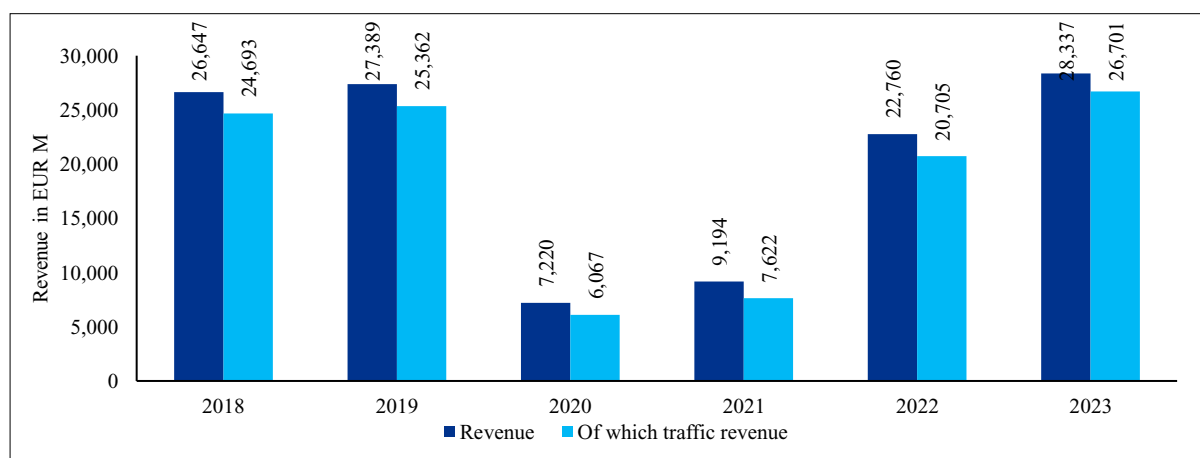


Figure 7: Revenue of Passenger Airlines Segment

In terms of regional distribution of traffic revenues in the Passenger Airlines segment, Europe, Lufthansa's home market, accounts for the largest share with 41%, followed by America at 26.9% and Asia/Pacific at 12.6%.

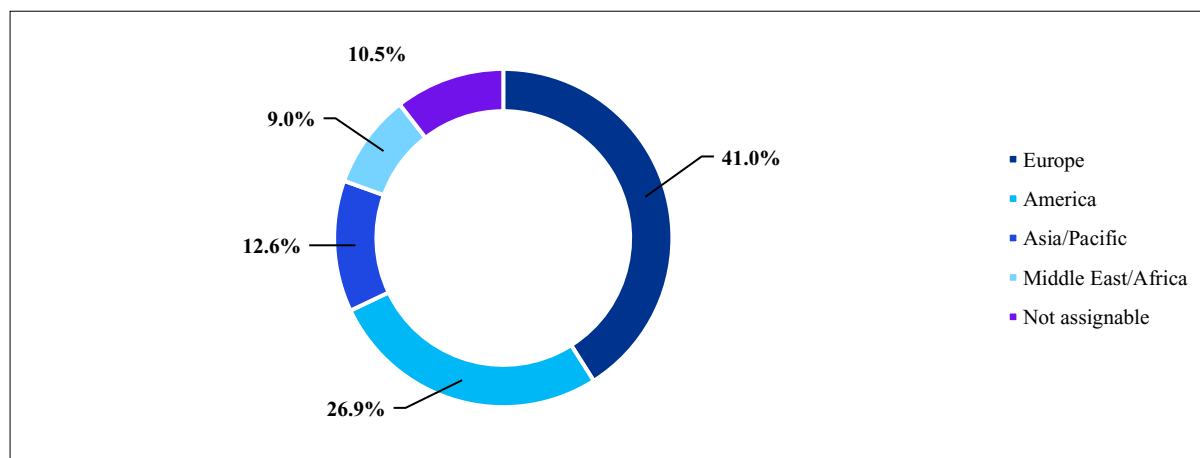


Figure 8: Net Traffic Revenue of Passenger Airlines Segment by Region in 2023

3.5.2 Logistics

The logistics business segment is the third largest segment of the Group. It encompasses a comprehensive network of various specialized subsidiaries. Central to this segment is Lufthansa Cargo, the Group's logistics specialist, focusing primarily on airport-to-airport airfreight services. Its product portfolio includes standard and express freight, along with specialized products. Special products cover the transportation of live animals, valuable items, post and dangerous goods, and the carriage of temperature-controlled goods, with a particular

increase in demand for the latter category. Lufthansa Cargo operates its own dedicated freighters and uses the belly capacities of the Group's various airlines to transport freight.

Following exceptional successful years in 2021 and 2022, during which the airfreight market benefited from a shortage of belly capacities due to the pandemic and a significant increase in demand, the operating performance returned to normal levels. Yields declined 39.3% to EUR 37.2 cent but were still significantly higher compared to pre-crisis levels in 2019. Revenue in the Logistics segment decreased to EUR 2,977m (-36%), of which EUR 2,775m (-37%) was attributed to traffic revenue. Capacity, measured in available cargo-tonne kilometers, expanded in all traffic regions and was overall 7% higher than in the previous year (Deutsche Lufthansa AG, 2024).

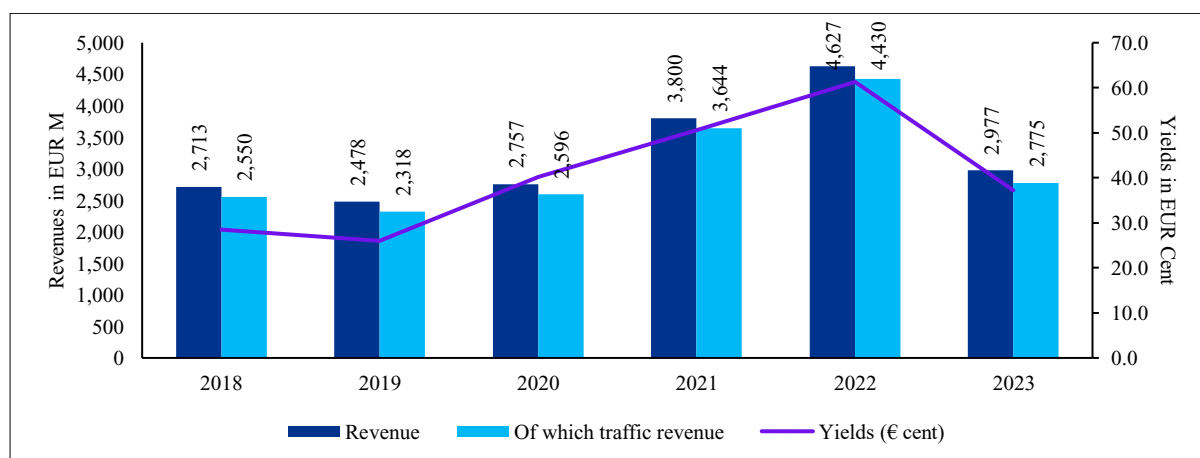


Figure 9: Revenue, Traffic Revenue and Yields of Logistics Segment

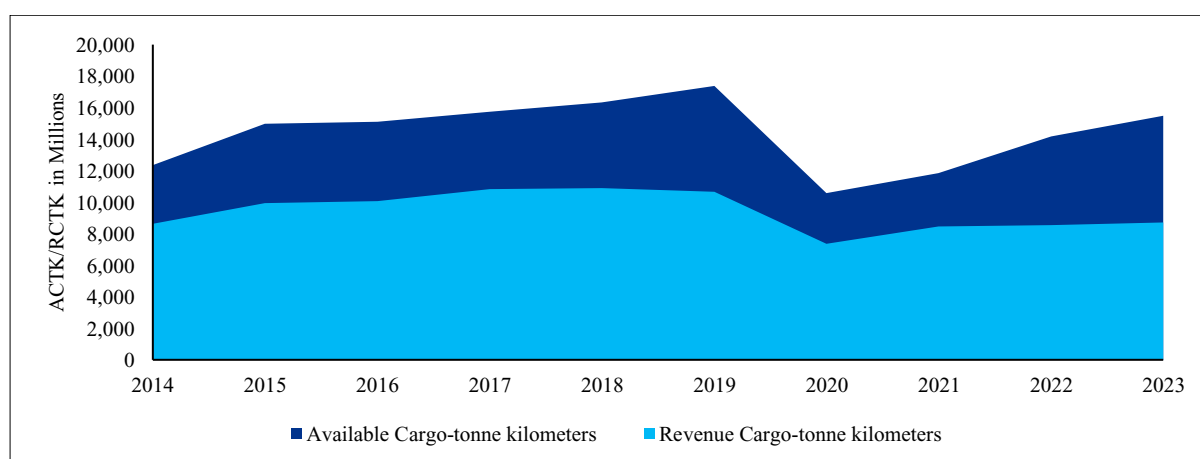


Figure 10: ACTK vs RCTK

In terms of regional distribution of traffic revenues in the Logistic segment, America and Asia/Pacific are Lufthansa Cargo's main traffic regions. They account for almost 85% of revenues.

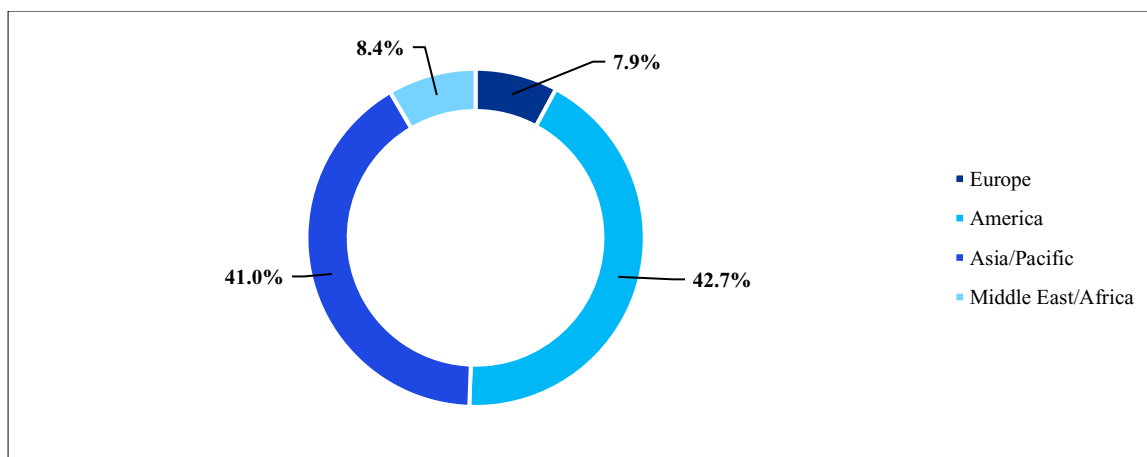


Figure 11: Logistics Traffic Revenue by Region

3.5.3 MRO

The MRO segment includes Lufthansa Technik, a global leading manufacturer-independent provider of maintenance, repair and overhaul (MRO) services for civilian commercial aircraft. Lufthansa Technik serves over 800 customers worldwide, including original equipment manufacturers (OEMs), aircraft leasing companies, operators of VIP jets, government and military entities, as well as airlines.

Lufthansa Technik has initiated an ambitious growth program named Ambition 2030, with the goal of reinforcing its leadership in the aircraft technical services market. The company is anticipating high demand for MRO services going forward, especially for engines. This expected increase is driven by a rising number of older engines in flight operations and a greater maintenance intensity of newer engine generations.

In 2023, Lufthansa Technik demonstrated a robust customer base by servicing about 4,600 aircraft under long-term component contracts, reflecting an 8% increase from the previous year. The company acquired 27 new customers and secured 1,000 new contracts valued at EUR 8bn, of which EUR 3.1bn was with companies within the Lufthansa Group. Strong demand for flights and subsequent increases in MRO services positively impacted revenue and earnings, making 2023 another exceptionally successful year. Revenue in the MRO business segment was up by 18% to EUR 6,547m, of which EUR 2,158m was attributed to companies of the Lufthansa Group (Deutsche Lufthansa AG, 2024).

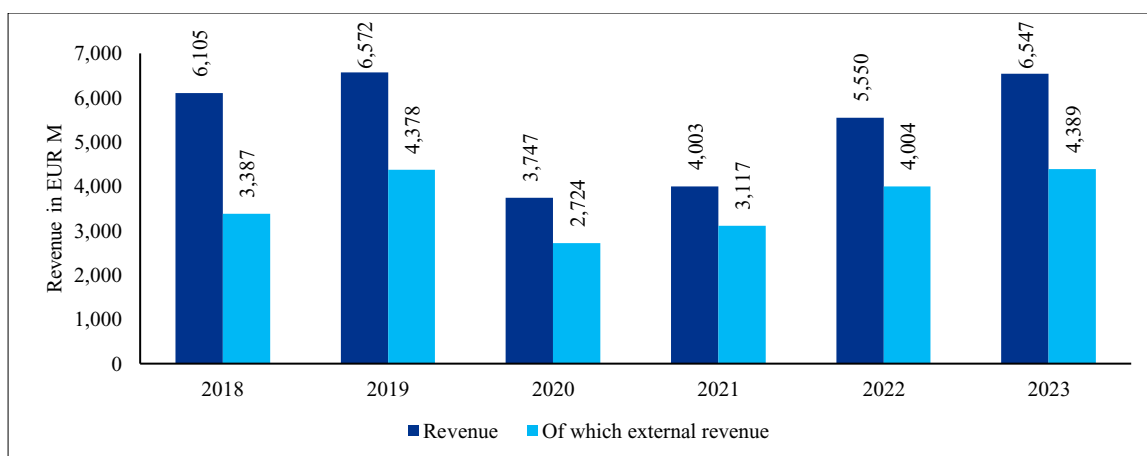


Figure 12: Revenue and External Revenue of MRO Business Segment

3.6 Fleet

At the end of 2023, the Group's fleet consisted of 721 aircraft with an average age of 13.4 years (Appendix 6). The fleet expanded year-on-year by 11 aircraft. By the end of 2023, Lufthansa had orders for 253 aircraft with purchase options for an additional 161. Lufthansa economically owns 89% of its total fleet, with the remaining 11% being leased. In the medium to long term, Lufthansa plans to increase the proportion of its fleet that is leased (Deutsche Lufthansa AG, 2024).

3.7 Route Network

In 2023, Lufthansa enhanced its route network, operating at about 96% of its pre-crisis destination coverage and 84% of its former capacity. Lufthansa transports business and leisure passengers to over 310 destinations globally. In Europe, the airlines connect to more than 185 destinations across 42 countries. In North America they fly to 31 destinations, 12 in Middle East, 47 in Africa, 18 in Asia, and 13 in Central and South America. For long-haul routes, the network airlines are supplemented by the route networks of Star Alliance and joint venture partners. Eurowings, the Group's value carrier, offers non-stop flights from 13 bases to over 150 European destinations. (Deutsche Lufthansa AG, 2024).

4 Market Analysis

This section examines the market environment of Lufthansa, focusing on the company's competitive landscape, and overall market demand. This analysis aims to provide a clear understanding of Lufthansa's position within the industry and identify factors that could influence its future growth and market share, thereby influencing valuation outcomes.

4.1 Market Description

As discussed, Lufthansa operates across three primary business segments: Passenger Airlines, Logistics and MRO. Each segment is influenced by specific drivers and market forces. Hence, this analysis separately explores the passenger air transport, air cargo, and MRO markets to understand their unique dynamics and challenges. However, it particularly emphasizes the air travel market, as this segment represents 78% of the Group's external revenue (Deutsche Lufthansa AG, 2024).

4.1.1 Passenger Air Transport Market

The global passenger air transport market is expected to grow from USD 862.29bn in 2023 to USD 919.43bn in 2024, according to The Business Research Company (2024). Over the medium term, the market is anticipated to grow significantly, reaching USD 1,173.37bn by 2028, with a compound annual growth rate (CAGR) of 6.3% (The Business Research Company, 2024).

Historically, the demand for air travel has shown consistent growth over the past decades. The global airlines industry saw an increase in the number of flights from 27.8 million in 2010 to 38.9 million in 2019, reflecting a CAGR of 3.8%. During the same period, passenger demand in the global air traffic sector experienced consistent year-on-year growth. The onset of the COVID-19 pandemic in 2020 had a catastrophic impact on the industry, triggered by worldwide travel restrictions and a sharp decline in demand. This led to a 56.6% decrease in the number of flights and a 65.8% plunge in passenger air traffic demand. However, the sector has shown signs of a strong recovery starting from 2021. Data indicates a significant rebound, with air traffic demand surging by 21.8% in 2021 and 64.2% in 2022. Additionally, the number of flights performed almost approached pre-pandemic levels, with a total of 36.8 million flights recorded in 2023. This recovery trajectory reaffirms the long-term growth trend, with forecasts by IATA and ICAO (2023) predicting that the number of flights in 2024 will surpass pre-pandemic levels. Other sources also support a positive long-term outlook, including Airbus, which expects passenger traffic demand to grow by 3.6% over the next 20 years (Airbus, 2023).

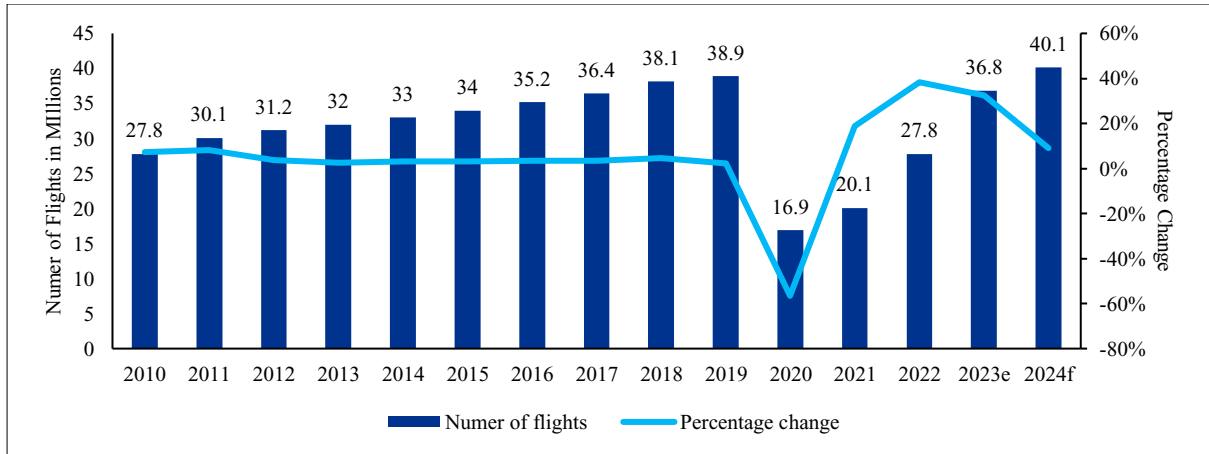


Figure 13: Number of Flights Performed by Global Airline Industry

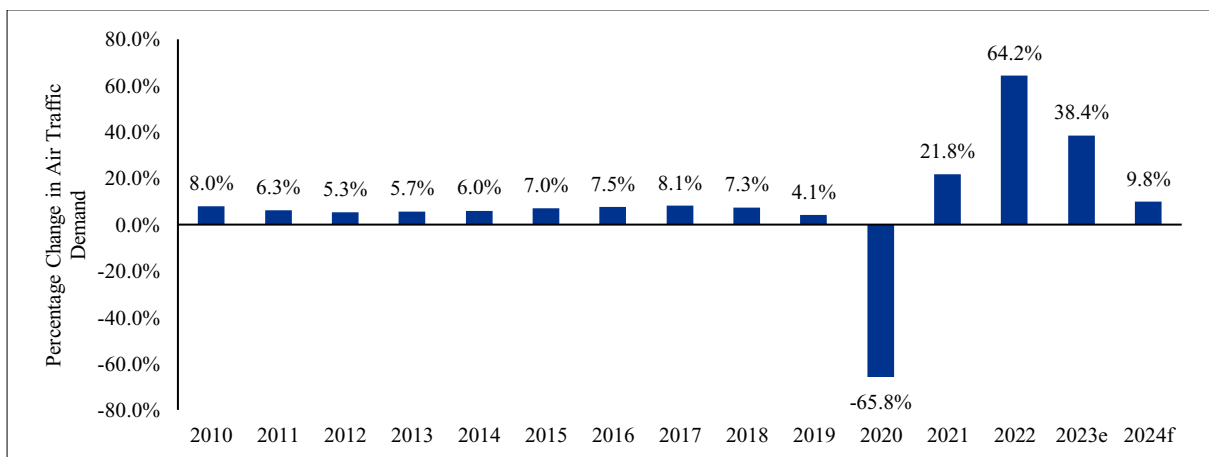


Figure 14: Annual Growth in Global Air Traffic Passenger Demand

In terms of geographical distribution in 2023, measured in Revenue Passenger Kilometers (RPK), the Asia-Pacific region captured the largest market share, accounting for 31.7%, followed by Europe with 27.1%, and North America with 24.2%, as reported by IATA (2024).

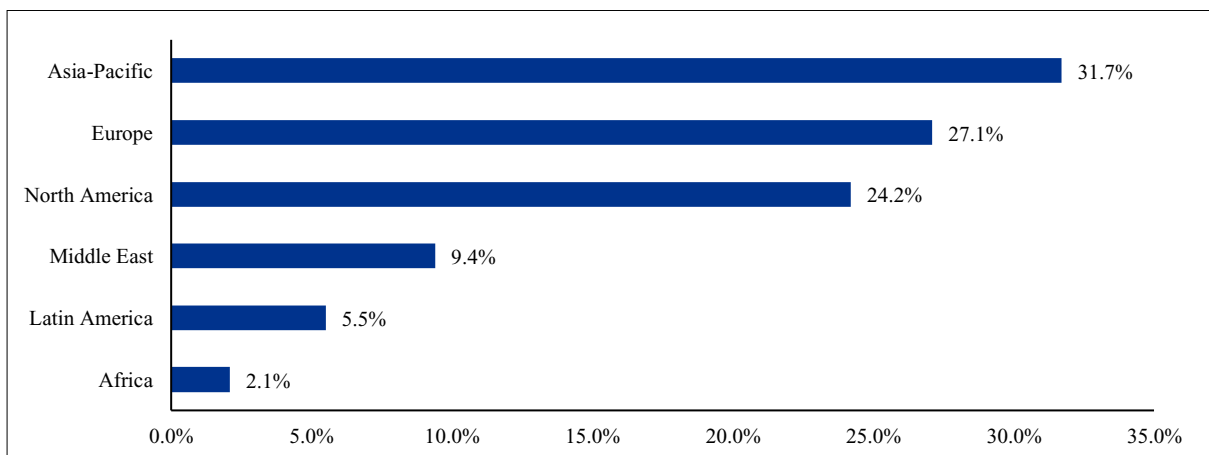


Figure 15: Distribution of Airline Passenger Traffic in 2023 by Region, based on RPK

The market concentration varies significantly across these regions. North America exhibits a high level of concentration, with the top three airlines controlling 50% of the region's scheduled seat capacity. In contrast, Europe's market is less concentrated, requiring 10 airlines to reach a collective 50% share, while in Asia-Pacific, it takes 18 airlines to account for half of the region's total market (IATA, 2023).

The competition in the passenger air transport market can generally be split based on the business model each airline pursues. Full-service carriers (FSC), including industry leaders like American Airlines, United Airlines, Lufthansa, and British Airways, aim for profitability across their networks. Meanwhile, low-cost carriers (LCC) such as Southwest Airlines, Ryanair, IndiGo, and EasyJet prioritize profitability on specific routes and focus on efficient point-to-point connectivity. Over time, LCCs have significantly increased their market share across almost all global regions.

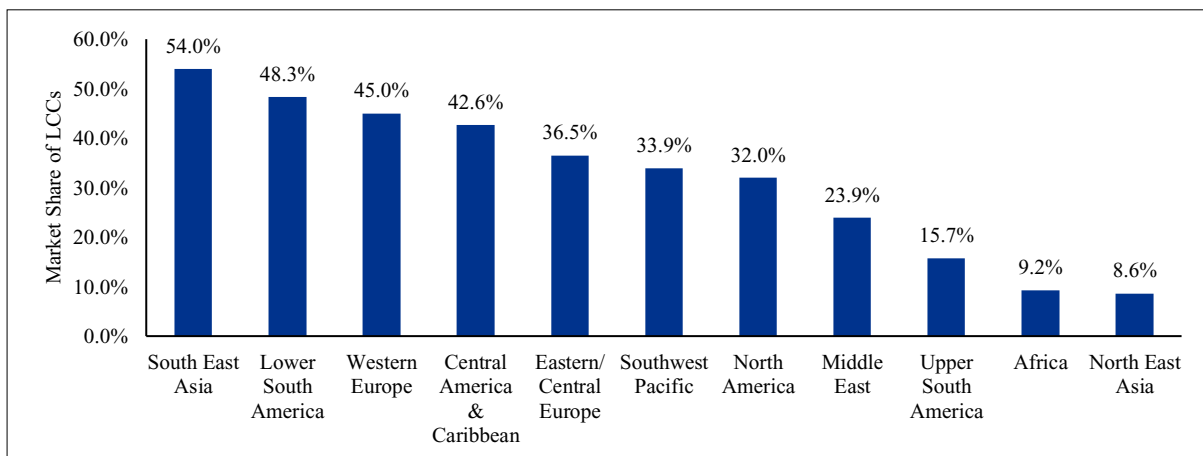


Figure 16: Market Share of LCCs Worldwide in March 2022, by Region (based on Seat Capacity)

4.1.2 Air Cargo Market

The air cargo market is a significant component of the global transportation industry. Despite accounting for less than 1% of the world's trade by weight, it represents 35% of the value of all globally traded goods (IATA, 2024). The market is characterized by intense competition, with many airlines and cargo operators offering services globally. These operators generally fall into four primary categories:

Belly-only operators: Use cargo space available within passenger aircraft networks. Examples include American Airlines and United Airlines.

Cargo specialists: Operate fleets of dedicated freighter aircraft for transporting general freight. Examples include Cargolux and AirAct.

Combination carriers: Use both dedicated freighters and the cargo capacity of their passenger fleets. Examples include Deutsche Lufthansa and Turkish Airlines.

Express carriers: Maintain extensive fleets of freighters of varying sizes. Examples include FedEx and UPS.

Notably, the latter three categories of operators generate 90% of the industry's cargo revenue.

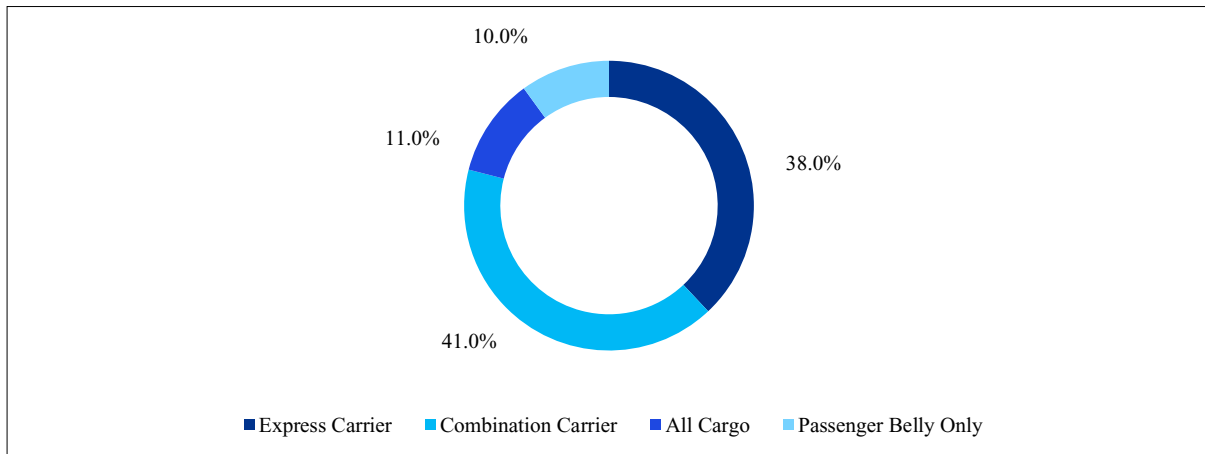


Figure 17: Air Cargo Revenue Share by Operator Type in 2021

In terms of growth, the global air cargo industry experienced modest expansion in the early 2010s, which accelerated recently with freight volumes climbing to 65.6 million metric tons in 2021. The business performance of the logistics market during the global pandemic was notably complex. Although air freight volumes decreased in 2020, revenue increased significantly from USD 100.8bn in 2019 to USD 175bn in 2021. This revenue growth was primarily driven by the heightened demand for rapid transport of goods via air during widespread lockdowns and reduced industrial production.

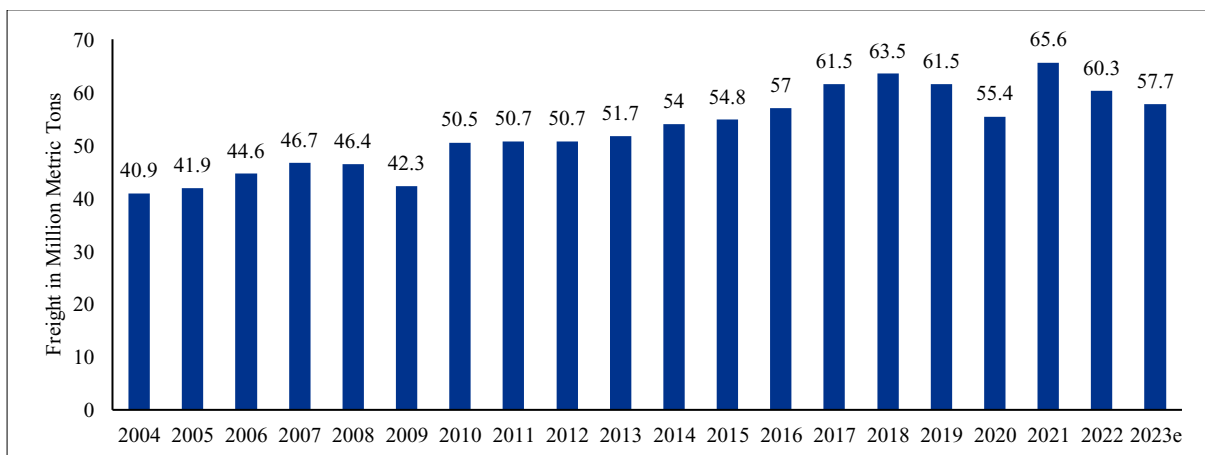


Figure 18: World Air Freight Traffic (in million metric tons)

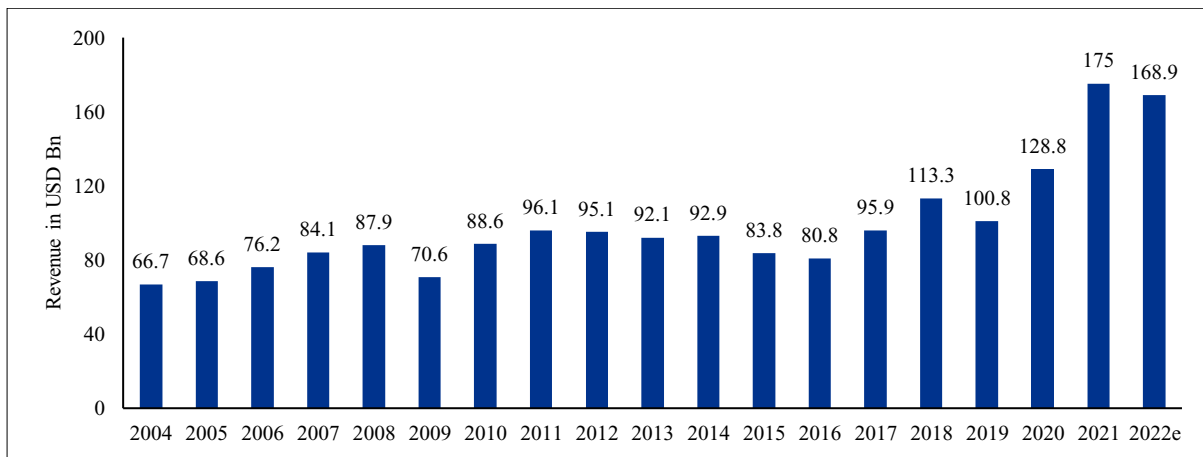


Figure 19: Worldwide Revenue of Cargo Airlines (in billion USD)

During the pandemic, disruptions in air cargo capacity and congested supply chains led to a significant increase in air cargo yields, which at times were triple the pre-pandemic averages. Although yields have begun to decrease as supply chains stabilize and passenger networks recover, rates remain considerably higher than pre-pandemic levels.

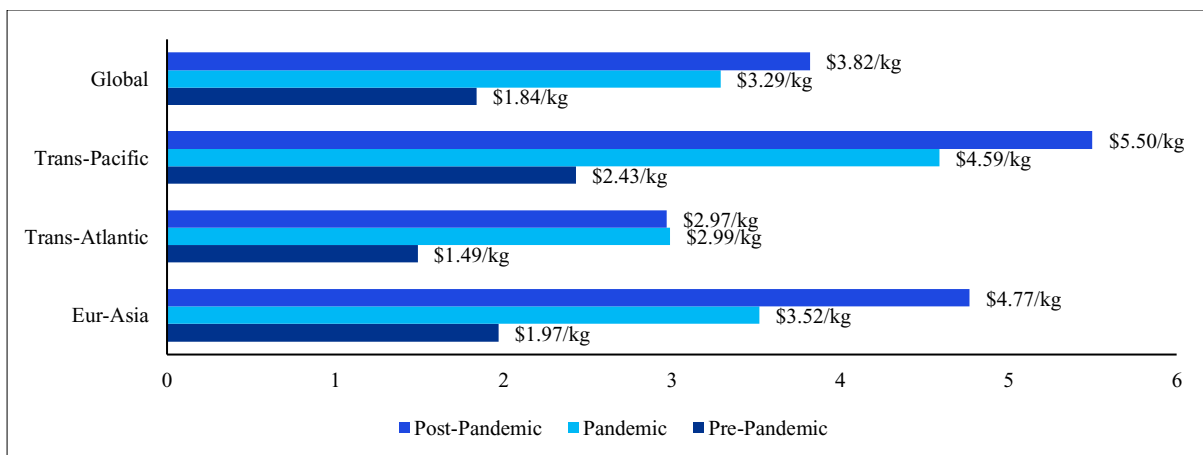


Figure 20: Global Air Cargo Yields

The air cargo market is influenced by multiple complex factors. For instance, the rapid expansion of e-commerce, particularly cross-border e-commerce, is expected to drive growth in air cargo. Additionally, factors such as market liberalizations, environmental regulations, and evolving trade relationships also impact the sector. Furthermore, the air cargo performance is closely linked to global economic developments.

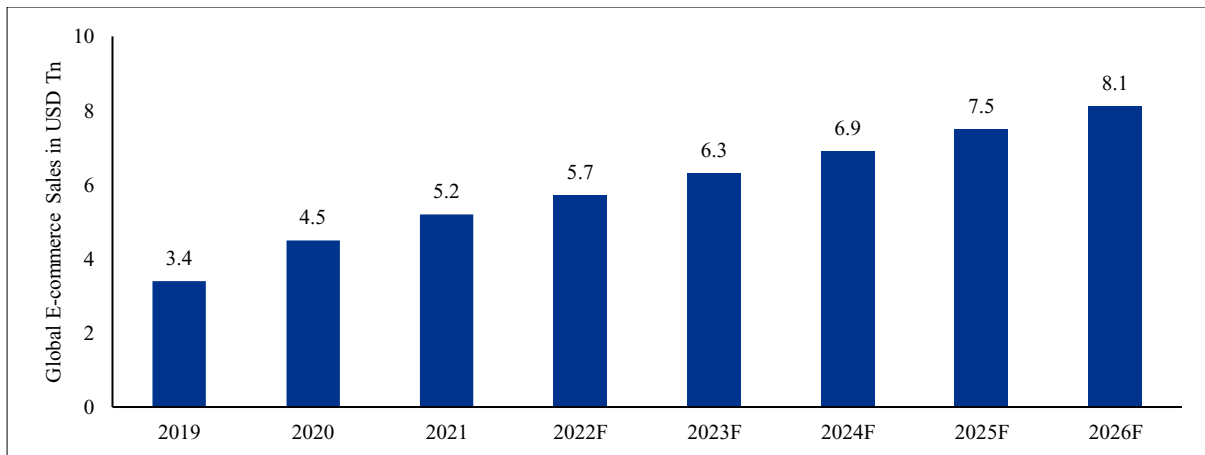


Figure 21: Global E-commerce Sales

According to Boeing, trade is expected to increase by 2.8% annually, outpacing general economic growth, and industrial production is forecasted to grow at an annual rate of 2.2%. Considering these economic factors, alongside regulatory and industry structure dynamics, air cargo traffic, measured in revenue tonne-kilometers (RTK) is anticipated to grow by an average of 4.1% annually from 2022 to 2041.

4.1.3 MRO Market

The global maintenance, repair, and overhaul (MRO) market experienced an 18% increase in 2022, reaching USD 77bn (Oliver Wyman, 2023). This growth was driven by an expanding fleet and higher aircraft utilization post-pandemic. According to the consulting firm Oliver Wyman, the MRO market is projected to grow at a CAGR of 2.9% from 2023 to 2033, potentially reaching USD 125bn by 2033. Despite a generally positive long-term outlook, the MRO sector faced considerable challenges during the pandemic.

The primary drivers of demand in the MRO sector are the number of the aircraft in the fleet and the level of aircraft utilization. While an increase in the number of aircraft naturally boosts the demand for MRO services, the level of utilization plays a crucial role as well. Most MRO demands, excluding airframe maintenance which is typically scheduled based on calendar time, such as engine, component, and line maintenance, are directly linked to the number of flying hours and operational cycles of the aircraft. Consequently, the market size and its growth are heavily dependent not only on the number of aircraft in service, but also on how intensively these aircraft are operated.

The MRO market is categorized into four main segments, namely engine, airframe, component, and line maintenance. Engine MRO has historically been the largest segment of the market and continues to dominate. In 2023, the engine MRO segment reached a value of USD 43bn and is projected to grow at a CAGR of 4% over the next decade, reaching USD 63.4bn by 2033. This robust growth is driven by the expansion of aircraft fleets and the introduction of more sophisticated next-generation engines, which require increased maintenance.

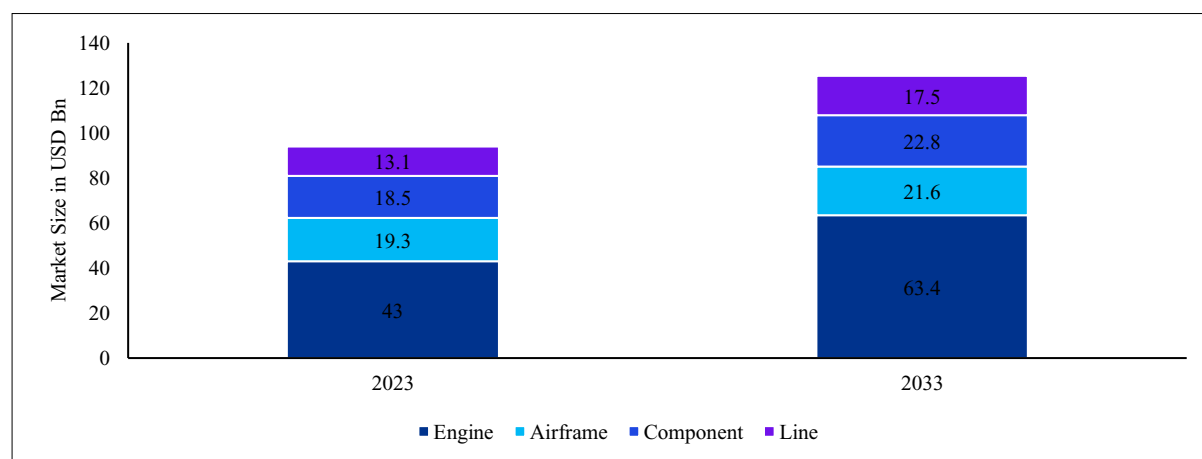


Figure 22: Projected Global MRO Market Size by Segment

Line maintenance is influenced by both utilization and calendar time and involves required checks as recommended by manufacturers and mandated by regulators. The market for line MRO fluctuates with fleet size. Line MRO is largely independent of aircraft age, which leads to steady expenditure on line maintenance across different aircraft ages. In 2023, line MRO was valued at USD 13.1bn and is projected to grow at a CAGR of 3% through 2033.

Component maintenance involves some scheduled maintenance but is primarily driven by changes in fleet size and utilization. In 2023, the component MRO market was valued at USD 18.3bn and is projected to grow 2.1% annually throughout the forecast period.

Airframe MRO typically tends to be resilient due to mandatory maintenance events driven by calendar time. However, the sector is only expected to grow modest at a rate of 1.1% annually over the next decade. This reflects the fact, that newer aircraft generally require less airframe maintenance compared to older models.

4.2 Lufthansa's Position in the Market

Lufthansa leads the European market as the top airline group in terms of passenger numbers and revenue.

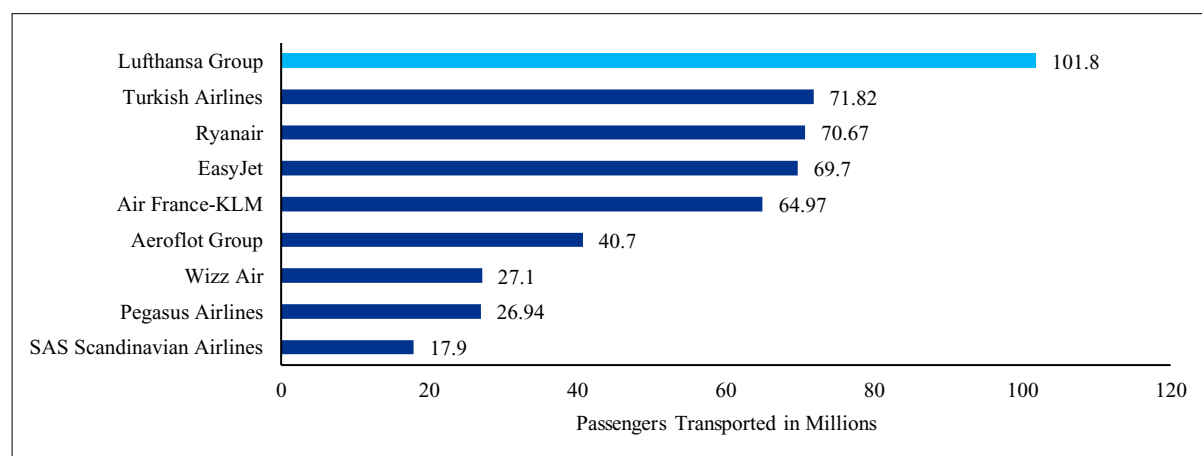


Figure 23: Leading European Airlines based on Passenger Traffic in 2022

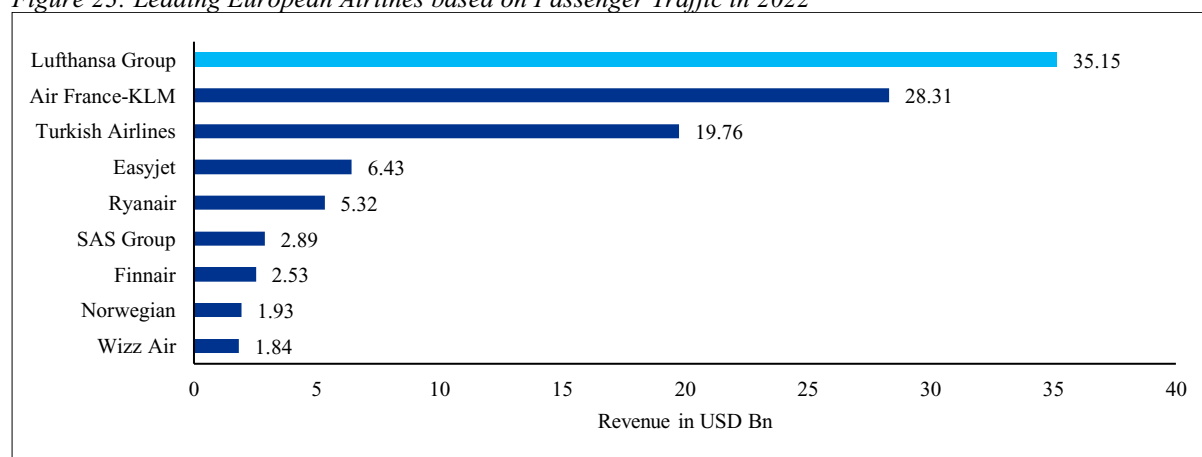


Figure 24: Leading European Airlines based on Revenue in 2022

On a global scale Lufthansa ranks fourth in revenues as of 2023. Despite performing almost 950,000 flights in 2023, the company represents only 2.57% of the global airline industry's total flights, highlighting the industry's fragmentation.

Lufthansa's core business and strategic focus is the passenger airlines business segment, as it contributes 78% to external group revenue. The Group maintains a diverse portfolio of dedicated airlines within this segment. Lufthansa and SWISS service the premium market, targeting business clients and those with high standards. Additionally, recognizing the growing demand for LCCs, Lufthansa has strategically positioned Eurowings to address price-sensitive customers, accounting for 10.5% of the Group's revenue seat kilometers (RSKs). This strategic positioning allows Lufthansa to capitalize on future growth opportunities not only in the premium sector but also significantly in the low-cost segment.

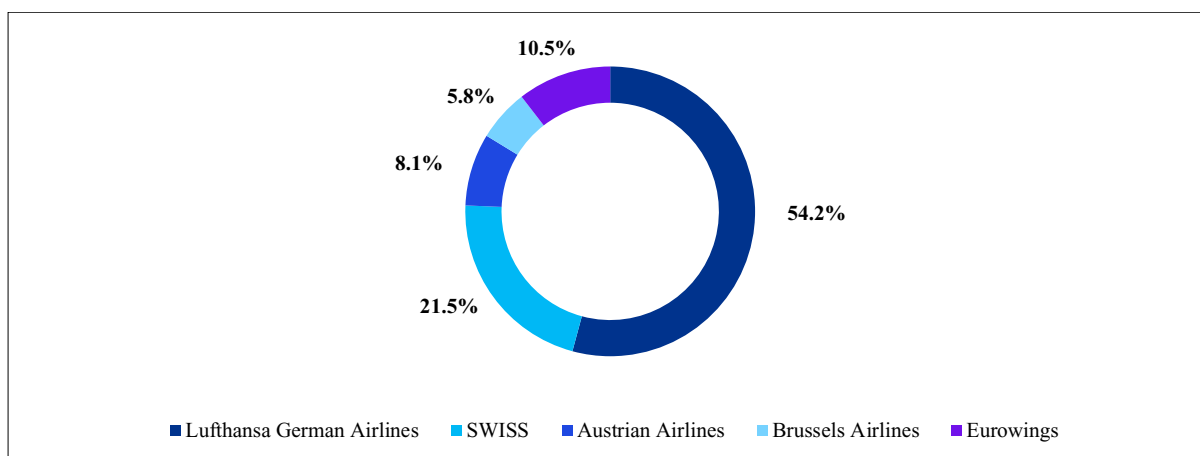


Figure 25: RSK Contribution by Airline in 2023

The Group is strongly positioned in the air cargo business, operating as a combination carrier that uses both the belly capacity and dedicated freighters. With Lufthansa Cargo, the Group has the resources and expertise to take advantage of the expected significant growth in the industry, especially driven by the increase in e-commerce shipments.

With Lufthansa Technik, the world's leading provider of MRO services, the Group is ideally positioned to address global MRO needs, particularly in the engine segment. The launch of the Ambition 2030 growth program represents the company's investment to further enhance its position, potentially allowing for faster growth than the overall market, which is projected to grow at 2.9%.

4.3 Macroeconomic Environment

Given the significant influence of macroeconomic factors on the aviation industry, it is important to examine the current situation and any recent developments.

Airlines are highly dependent on jet fuel, which accounts for a significant portion of their operating expenses, making their profits sensitive to fluctuations in oil prices. The ongoing war in Ukraine has notably affected oil prices. A particular recent challenge has been the persistent high spread between the price of jet fuel and Brent crude oil, known as the "jet crack". This spread has widened due to a strong rebound in air travel and constrained refining capacity, which has limited the supply of jet fuel and driven up its prices.

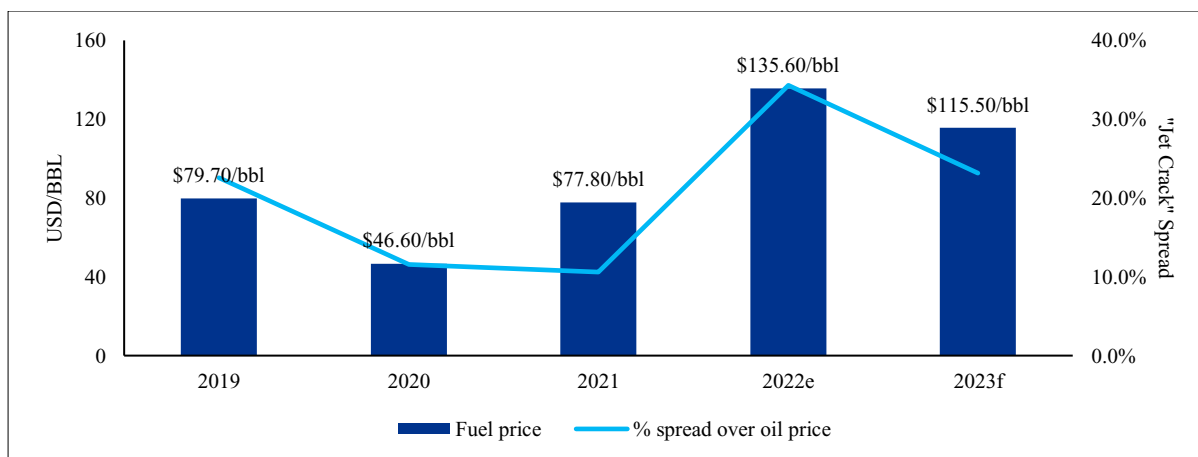


Figure 26: Jet Fuel price and Percentage Spread over Oil Price

The COVID-19 pandemic and the war in Ukraine in 2022 disrupted a long period of low inflation, driving the inflation rate in the Eurozone to a peak of 10.6% in October 2022, according to the ECB (2024). Despite aggressive policy tightening, inflation rates have remained high. This persistent inflation has significantly affected the airline industry, especially with the rising costs of jet fuel. Additionally, high inflation can reduce consumer spending power, potentially leading to decreased air travel. However, recent ECB data from February 2024 shows a normalization of inflation rates to 2.6%, suggesting a stabilization of economic conditions.

Geopolitical tensions, such as the ongoing war in Ukraine and conflicts in the Middle East, can have a significant impact on the global economy. These conflicts also have direct implications for the aviation industry, as they may result in airspace closures and route diversions.

Despite recent challenges, the global economy remains resilient. According to the OECD's economic outlook published in May 2024, the global GDP is expected to grow at a modest rate, with projections of 3.1% in 2024 and 3.2% in 2025.

5 Financial Analysis & Forecast

The valuation of Lufthansa involves a detailed analysis and forecast of the financial statement items that contribute to the free cash flow. This analysis is based on historical data from FY18 to FY23. The financial figures are forecasted over an explicit period of seven years, from FY24 to FY30, after which the company is expected to reach a phase of stable growth. The rationale for this seven-year timeframe is anchored in substantial investments and growth programs across the various business segments, anticipated to be completed by 2030. Financial

projections for FY24 are derived from the first quarter results and the company's guidance for the full year 2024. The analysis will start with the income statement items and then move on to the balance sheet items.

5.1 Income Statement

For the forecast of Lufthansa's income statement, a standard top-down approach is chosen. A detailed overview of the forecasted income statement is provided in Appendix 7.

5.1.1 Revenue

Lufthansa's revenue is primarily derived from two components: traffic revenue and other revenue. Traffic revenue, which constitutes about 80% of the total, includes the Passenger Airlines and Logistics segments. The remainder, categorized as other revenue, primarily comes from MRO activities, with additional contributions from various business and group functions.

5.1.1.1 Traffic Revenue

In terms of traffic revenue, the Passenger Airlines and Logistics sectors are forecasted separately due to distinct market dynamics influencing each segment.

Passenger Airlines traffic revenue is influenced by revenue passenger kilometers (RPK), a measure of demand, and yields, which represent earnings per kilometer flown per passenger. Historically, Lufthansa has seen a strong growth in RPK at a rate of 6.7% annually pre-pandemic. Although there was a significant drop during the pandemic, RPK has been recovering robustly, with growth rates of 12% in Q1 2024, surpassing the IATA prediction of 10% for the full year of 2024 (Deutsche Lufthansa AG, 2024). Lufthansa's momentum indicates that an annual growth of 12% for the full year of 2024 is reasonable. Looking ahead, RPK growth is expected to moderate, aligning with a slightly more conservative outlook compared to the Business Research Company's forecast of an annual growth rate of 6.3% through 2028. Subsequently, growth is projected to slow further to 3.6%, reflecting Airbus's long-term annual growth forecast up to 2042.

Prior to the pandemic, Lufthansa's yields declined to 8.7 cents in 2019, followed by a period of volatility. Yields rebounded in 2022 and 2023, yet they turned negative again in the first quarter of 2024, reporting a decline of 2.5%. While IATA projects a yield growth of 1.8% for the full year of 2024 (Deutsche Lufthansa AG, 2024), this forecast appears overly optimistic

for Lufthansa. It is anticipated that yields will continue to decrease through 2024 and 2025 before stabilizing with modest growth of 1% annually starting in 2027. Although Lufthansa's premium focus has the potential to boost yields, competitive pressures within the industry are likely to keep yield growth relatively subdued.

	2018	2019	2020	2021	2022	2023	2024E	2025F	2026F	2027F	2028F	2029F	2030F
Passenger Airlines	25,251	25,818	6,482	8,232	21,434	27,151	29,953	31,284	32,856	34,512	36,251	37,932	39,690
% of traffic revenue	90.8%	91.8%	71.4%	69.3%	82.9%	90.7%	92.8%	92.9%	92.8%	92.7%	92.7%	92.7%	92.7%
% growth	-3.0%	2.2%	-74.9%	27.0%	160.4%	26.7%	10.3%	4.4%	5.0%	5.0%	5.0%	4.6%	4.6%
RPK	284,639	296,217	69,462	89,397	207,030	249,269	279,181	294,536	307,790	320,102	332,906	344,891	357,307
% growth	9.0%	4.1%	-76.6%	28.7%	131.6%	20.4%	12.0%	5.5%	4.5%	4.0%	4.0%	3.6%	3.6%
Yield (passenger)	0.09	0.09	0.09	0.09	0.10	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11
% growth	-11.0%	-1.8%	7.1%	-1.3%	12.4%	5.2%	-1.5%	-1.0%	0.5%	1.0%	1.0%	1.0%	1.0%

Figure 27: Passenger Airlines Traffic Revenue Forecast

Traffic revenue in the Logistics business segment is influenced by revenue tonne-kilometers (RTK), a measure of demand, and yields, which represent earnings per tonne-kilometer of cargo carried. Historically, demand for air cargo has seen strong growth. Before the pandemic, Lufthansa consistently expanded its RTK, though it faced a sharp decline during the pandemic, albeit less severe than the drop in its passenger business. Post-pandemic recovery has been strong, with RTK rising by 10% in Q1 2024. For full year 2024 an 8.0% increase in RTK is assumed, aligning with Lufthansa's more conservative 5% full year guidance. From 2025, growth is expected to remain strong before tapering to 4.0% over the midterm. The near-term growth is fueled by heightened demand in air cargo, particularly due to the surge in e-commerce shipments. The shift to a longer-term growth rate of 4.0% is consistent with Boeing's forecast of 4.1% annual growth from 2022 through 2041.

Industry wide air cargo yields have historically exhibited a trend of decline, with an average annual decrease of 3% in the decade leading up to the pandemic (Boeing, 2022). Lufthansa's yields, too, demonstrated fluctuations before ultimately falling to 26 cents in 2019. The pandemic introduced unprecedented volatility in these yields, driving a sharp increase to a peak of 61 cents in 2022. However, as market conditions begin to normalize, substantial declines have been observed with yields dropping by 39.4% in 2023 and continuing into Q1 2024. For the full year of 2024, a decline of 22.5% is projected, slightly more pessimistic compared to the company's guidance of a 20.9% decrease. Looking ahead, air cargo yields are expected to stabilize at levels still above pre-pandemic figures, with future growth rates anticipated to be minimal, largely mirroring inflation-related increases in yield.

	2018	2019	2020	2021	2022	2023	2024E	2025F	2026F	2027F	2028F	2029F	2030F
Logistics	2,550	2,318	2,596	3,644	4,430	2,775	2,323	2,399	2,544	2,698	2,834	2,977	3,127
% of traffic revenue	9.2%	8.2%	28.6%	30.7%	17.1%	9.3%	7.2%	7.1%	7.2%	7.3%	7.3%	7.3%	7.3%
% growth	7.5%	-9.1%	12.0%	40.4%	21.6%	-37.4%	-16.3%	3.3%	6.0%	6.1%	5.0%	5.0%	5.0%
RTK	8,934	8,899	6,461	7,198	7,231	7,471	8,069	8,593	9,066	9,519	9,900	10,296	10,708
% growth	0.5%	-0.4%	-27.4%	11.4%	0.5%	3.3%	8.0%	6.5%	5.5%	5.0%	4.0%	4.0%	4.0%
Yield (cargo)	0.29	0.26	0.40	0.51	0.61	0.37	0.29	0.28	0.28	0.28	0.29	0.29	0.29
% growth	6.9%	-8.7%	54.3%	26.0%	21.0%	-39.4%	-22.5%	-3.0%	0.5%	1.0%	1.0%	1.0%	1.0%

Figure 28: Logistics Traffic Revenue Forecast

5.1.1.2 Other Revenue

As previously mentioned, other revenues primarily consist of earnings from MRO activities, complemented by revenues from a mix of various business and group functions, which are grouped under the category “other”. Given this structure, the forecast prioritizes accurate projections of MRO revenues, which are expected to guide the trends in the “other” category. However, due to historically weaker performance and the strong demand anticipated for MRO services, growth in the “other” sub-category is projected to lag slightly behind MRO. In 2023, both MRO and “other” revenue streams demonstrated comparable percentage growth, reinforcing the rationale for aligning the growth forecasts of “other” revenues with those of MRO. Finally, it is crucial to acknowledge the significant decline in “other” revenues in 2022, attributed primarily to the divestiture of the catering segment.

Before the pandemic, the MRO segment saw notable growth thanks to strong demand and Lufthansa Technik’s leadership in the industry. This rapid growth ended with the onset of the pandemic. By 2021, recovery was underway, with revenues in 2023 surpassing levels seen before the pandemic. The results of Q1 2024 showed a robust 15.0% increase in revenues, exceeding the expected full-year growth of 7% (Deutsche Lufthansa AG, 2024). According to the consultancy firm Oliver Wyman (2023), the overall MRO market is predicted to grow by 2.9% annually from 2023 to 2033, with the engine segment leading at a 4% CAGR. This forecast matches Lufthansa’s expectations, especially for engine MRO, where the company anticipates a significant increase in revenue, supported by investments through their Ambition 2030 program. As a result, growth for Lufthansa’s MRO segment is assumed to be well above the market average for several years before normalizing to the slower long-term market growth rate. The “other” revenue category is projected to grow at 75% of the MRO growth rates.

	2018	2019	2020	2021	2022	2023	2024E	2025F	2026F	2027F	2028F	2029F	2030F
Other revenue	7,741	8,288	4,511	4,935	5,031	5,516	5,987	6,357	6,689	6,975	7,241	7,447	7,660
% growth	7.8%	7.1%	-45.6%	9.4%	1.9%	9.6%	8.5%	6.2%	5.2%	4.3%	3.8%	2.9%	2.9%
% of total revenue	21.8%	22.8%	33.2%	29.4%	16.3%	15.6%	15.6%	15.9%	15.9%	15.8%	15.6%	15.4%	15.2%
MRO	3,927	4,378	2,724	3,117	4,004	4,389	4,784	5,095	5,375	5,617	5,842	6,017	6,198
% growth	10.1%	11.5%	-37.8%	14.4%	28.5%	9.6%	9.0%	6.5%	5.5%	4.5%	4.0%	3.0%	3.0%
Other	3,814	3,910	1,787	1,818	1,027	1,127	1,203	1,262	1,314	1,358	1,399	1,430	1,463
% growth	5.6%	2.5%	-54.3%	1.7%	-43.5%	9.7%	6.8%	4.9%	4.1%	3.4%	3.0%	2.3%	2.3%

Figure 29: Other Revenue Forecast

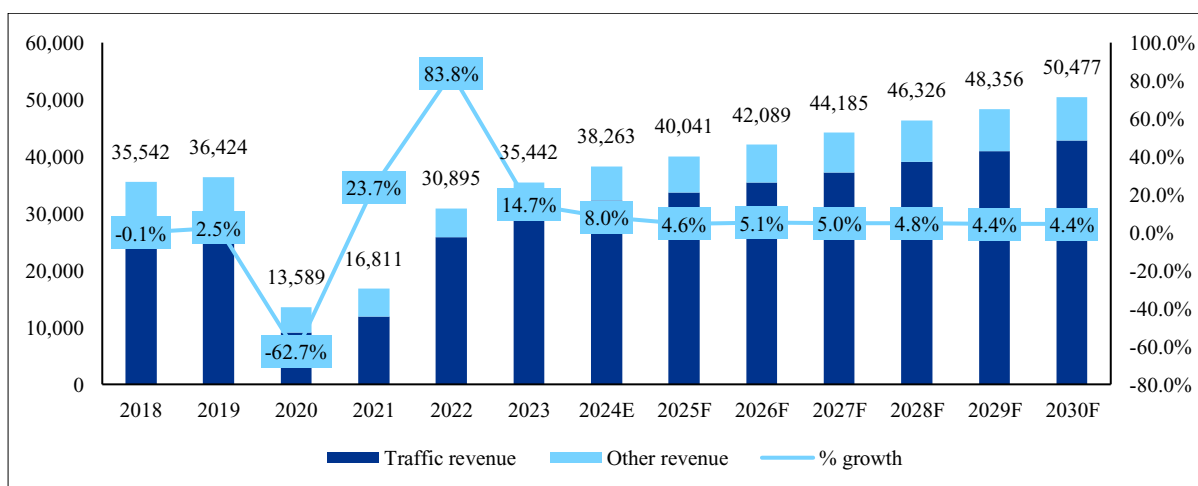


Figure 30: Revenue Forecast

5.1.2 Changes in Inventories and other Own Work Capitalized

Other own work capitalized is related to aircraft and engine overhauls. The notable increase in FY23 was driven by a substantial rise in maintenance inspections due to higher fleet utilization. Moving forward, such exceptional growth rates are not expected to recur. Instead, a rolling average of the last two years' percentage of revenue is applied, resulting in slight year-over-year increases aligned with fleet expansion.

Other operating income mainly includes foreign exchange gains, income from the reversal of provisions and accruals, and compensation received for damages, among other items. Pre-pandemic, this line item was relatively stable at approximately 5% of revenue. Post-pandemic, levels were around 200 basis points higher. Going forward, an average of pre-and post-pandemic levels as a percentage of revenue is applied to account for the differences observed during these periods.

	2018	2019	2020	2021	2022	2023	2024E	2025F	2026F	2027F	2028F	2029F	2030F
Changes in inventories and other own work capitalised	531	685	175	109	354	727	612	731	720	781	806	848	882
% growth	21.2%	29.0%	-74.5%	-37.7%	224.8%	105.4%	-15.9%	19.5%	-1.4%	8.5%	3.2%	5.2%	4.0%
% of total revenue	1.5%	1.9%	1.3%	0.6%	1.1%	2.1%	1.6%	1.8%	1.7%	1.8%	1.7%	1.8%	1.7%
Other operating income	1,818	1,889	1,897	1,602	2,180	2,413	2,312	2,419	2,543	2,669	2,799	2,921	3,050
% growth	-20.1%	3.9%	0.4%	-15.6%	36.1%	10.7%	-4.2%	4.6%	5.1%	5.0%	4.8%	4.4%	4.4%
% of total revenue	5.1%	5.2%	14.0%	9.5%	7.1%	6.8%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%
Total other operating income	2,349	2,574	2,072	1,711	2,534	3,140	2,923	3,150	3,263	3,451	3,605	3,770	3,931
% growth	-13.4%	9.6%	-19.5%	-17.4%	48.1%	23.9%	-6.9%	7.7%	3.6%	5.7%	4.5%	4.6%	4.3%

Figure 31: Total Other Operating Income Forecast

5.1.3 Cost Base

Next, the cost items will be analyzed and forecasted. Lufthansa's costs are categorized into four main areas: cost of materials and services, staff cost, D&A, and other operating expenses.

5.1.3.1 Cost of Materials and Services

This line item is particularly important for airline companies, as they are generally considered low-margin businesses, and much of their success depends on effective cost control. For Lufthansa, the cost of materials and services accounts for almost 60% of total revenue. This line item is divided into the cost of raw materials, consumables and supplies, and the cost of purchased services. The bulk of the first category includes aircraft fuel and other raw materials, while the latter category primarily comprises fees and charges, external MRO services, and in-flight services.

Given that these costs are largely tied to business volume, modeling them as a percentage of revenue is appropriate. Specific forecasting of jet fuel prices was not conducted due to the inherent difficulty in accurately predicting commodity prices over time. Additionally, Lufthansa employs a rule-based fuel hedging strategy with a time horizon of up to 24 months, aiming for an 85% hedging level (Deutsche Lufthansa AG, 2024).

Pre-pandemic, the cost of materials and services was approximately 53% of revenue. Post-pandemic, this increased to around 58%. Q1 2024 results highlight this trend, with costs for materials and services up 12% compared to the previous year. While fuel expenses remained flat year-over-year, other expenses rose due to business growth and price increases, such as those at airports. In the first quarter of 2024, strikes further increased Lufthansa's costs, with expenses for passenger assistance related to flight irregularities rising by 50%. Looking ahead, it is anticipated that strikes will diminish, and while costs are expected to remain higher as a percentage of revenue compared to pre-pandemic levels, a slight decreasing trend is forecasted.

Cost of raw materials are forecasted at 30.9% of revenue in 2024, and cost of purchased services is forecasted at 29.0% of revenue in 2024.

5.1.3.2 Staff Cost

Staff costs account for approximately 24% of Lufthansa's revenue. These costs are suitable for forecasting as a percentage of revenue, as labor is a critical input factor for an airline company, and these costs are closely tied to business volume. Pre-pandemic, staff costs stood at around 25% of revenues, while post-pandemic, they were approximately 150 basis points lower. The Q1 2024 results reinforce this forecasting approach, with expenses rising due to an 8% increase in headcount in response to business recovery. Maintaining the 2024 percentage of revenue at the level of 2023 will lead to higher staff cost driven by business growth. Moving forward, staff costs are expected to fluctuate slightly around 24%.

5.1.3.3 Depreciation, Amortization & Impairment

The majority of D&A expenditure relates to the depreciation of aircraft, which represents the allocation of the cost of operating these assets over their useful lives. Historically, as the fleet size increases, D&A expenses have risen correspondingly. For Lufthansa, D&A is forecasted as a percentage of the relevant asset base subject to D&A and impairment (Appendix 9). The significant increase in PP&E and aircraft and spare engines in 2019 (+81.9% and +9% respectively) is attributable to the first-time application of IFRS 16. This accounting standard requires companies to recognize leases on their balance sheets, which substantially increases the value of these balance sheet positions.

In 2020, the value of aircraft and spare engines decreased by nearly 15%, primarily due to pandemic-related impairments and the sale of aircraft. However, it is anticipated that in the near to mid-term, the asset base will stabilize and experience a modest increase, aligning with business growth.

To calculate D&A, the average of pre- and post-pandemic years percentage of relevant asset base is used and will be applied going forward. Consequently, an expanding fleet will result in higher D&A expenses.

5.1.3.4 Other operating expenses

This line item is highly fragmented and includes various positions such as foreign exchange losses, rental and maintenance expenses, sales commissions paid to agencies, advertising, and sales promotions, among others. As these expenses are closely tied to business volume and have historically been stable as a percentage of revenue, this cost position is forecasted to remain at 14.5% of revenue from 2024 onward, reflecting the recent post-pandemic level.

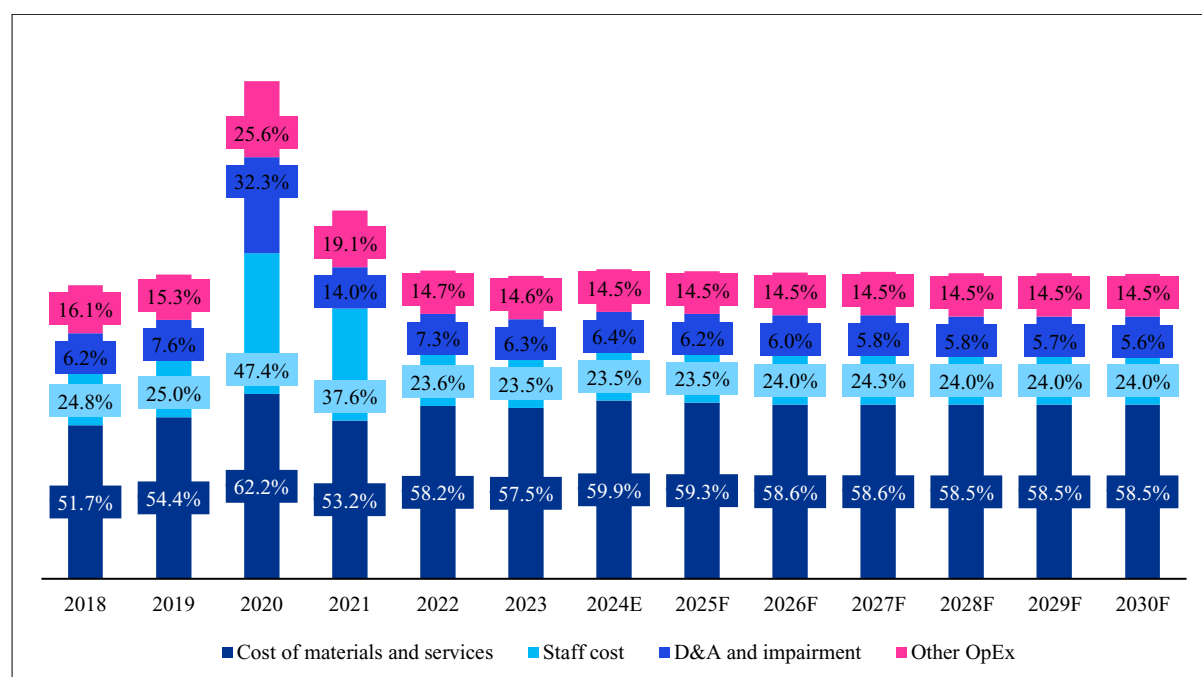


Figure 32: Cost Positions as Percentage of Revenue

5.1.4 Profit

After the challenging pandemic years, which saw Lufthansa and the broader aviation industry suffer significant net losses in 2020 and 2021, the outlook has improved significantly. Lufthansa's total revenues are projected to surpass pre-pandemic levels in 2024, with Q1 results already indicating a significant revenue increase. However, these results also highlight the ongoing difficulties in the current market environment. Large-scale strikes have put significant pressure on margins for 2024 and lowered earnings prospects. Despite these hurdles, in the mid-term margins are expected to improve slightly compared to 2024 levels, although they will likely remain below pre-pandemic benchmarks in the short term due to the competitive environment.

The positive revenue and margin outlook is supported by the robust industry prospects and Lufthansa's strong market position. The company's strategic focus on the premium segment,

investments in new, fuel-efficient aircraft, and efficiency measures such as fleet streamlining are promising indicators for future performance.

However, potential risks could impact this optimistic scenario. A tight labor market, increased inflation-related costs, higher fees and charges at airports, and heightened geopolitical uncertainties could constrain margin growth.

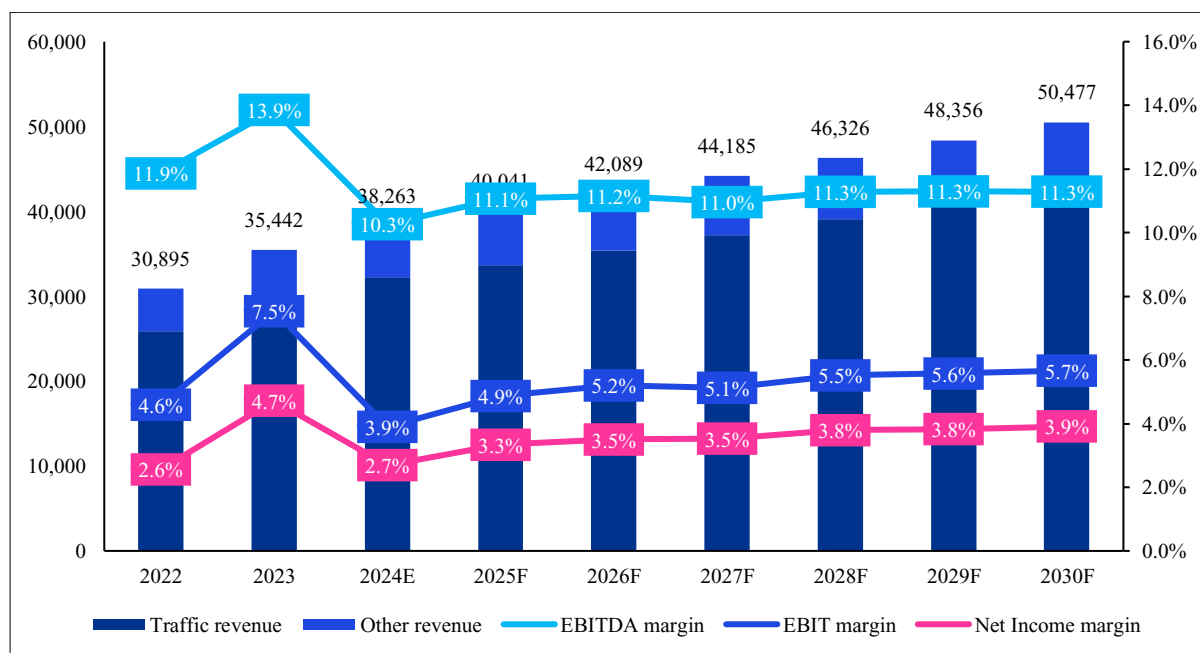


Figure 33: Revenue and Margin Forecast

Condensed Income Statement (€ Millions)	2024E	2025F	2026F	2027F	2028F	2029F	2030F
Traffic revenue	32,276	33,684	35,400	37,210	39,085	40,908	42,817
Other revenue	5,987	6,357	6,689	6,975	7,241	7,447	7,660
Total revenue	38,263	40,041	42,089	44,185	46,326	48,356	50,477
% growth	8.0%	4.6%	5.1%	5.0%	4.8%	4.4%	4.4%
Total other operating income	2,923	3,150	3,263	3,451	3,605	3,770	3,931
Total Opex	39,885	41,442	43,374	45,592	47,608	49,672	51,802
Profit/loss from operating activities	1,301	1,748	1,978	2,043	2,323	2,453	2,607
Result of equity investments	191	200	210	221	232	242	252
EBIT	1,492	1,948	2,188	2,264	2,554	2,695	2,859
Interest Exp. (Inc.), net	306	320	337	353	371	387	404
Other financial items	-212	-176	-138	-194	-186	-188	-207
Financial result	97	55	11	62	47	43	56
Profit/loss before income taxes	1,398	1,803	1,989	2,105	2,370	2,496	2,662
Income taxes	349	451	497	526	592	624	666
Profit/loss after income taxes	1,048	1,353	1,492	1,579	1,777	1,872	1,997
Profit/loss attributable to NCI	17	17	18	19	20	21	22
Net profit/loss attributable to shareholders of Deutsche Lufthansa	1,032	1,335	1,473	1,560	1,757	1,851	1,975
% growth	-38.3%	29.4%	10.3%	5.9%	12.7%	5.4%	6.7%

Table 1: Condensed Income Statement Forecast

5.2 Balance Sheet

The following section provides an analysis of all balance sheet items which are relevant for the calculation of the free cash flow to the firm.

5.2.1 Capital Expenditure

Lufthansa's capital expenditure has exhibited considerable volatility over the past decade, with a sharp decrease of nearly 65% in 2020, followed by substantial increase of 79% in 2022 and 50.3% in 2023. Investing in new and efficient aircraft and PP&E is essential for Lufthansa to support growth and staying competitive. Prior to the pandemic, Capex levels as a percentage of revenue were approximately 10%. These levels declined during the pandemic years but began rising again in 2024. Due to Lufthansa's ambitious plans to modernize its fleet extensively, and significant investments in Lufthansa Technik and Lufthansa Cargo, Capex is projected to further remain on a high level with 9.8% of revenue in 2024. Subsequently, it is expected to gradually decrease towards the end of the forecast period, reflecting a long-term sustainable level (Appendix 10).

This forecast captures Lufthansa's short- to mid-term investment ambitions while recognizing that, in the long term, Capex will decelerate and converge with D&A expenses. In a steady state, long-term Capex will primarily involve replacing existing assets, with only minimal growth-related expenditures. During the forecast period, the Capex to total tangible assets ratio is anticipated to decline from 15.7% in 2024 to below 11.5% by the end of the forecast period.

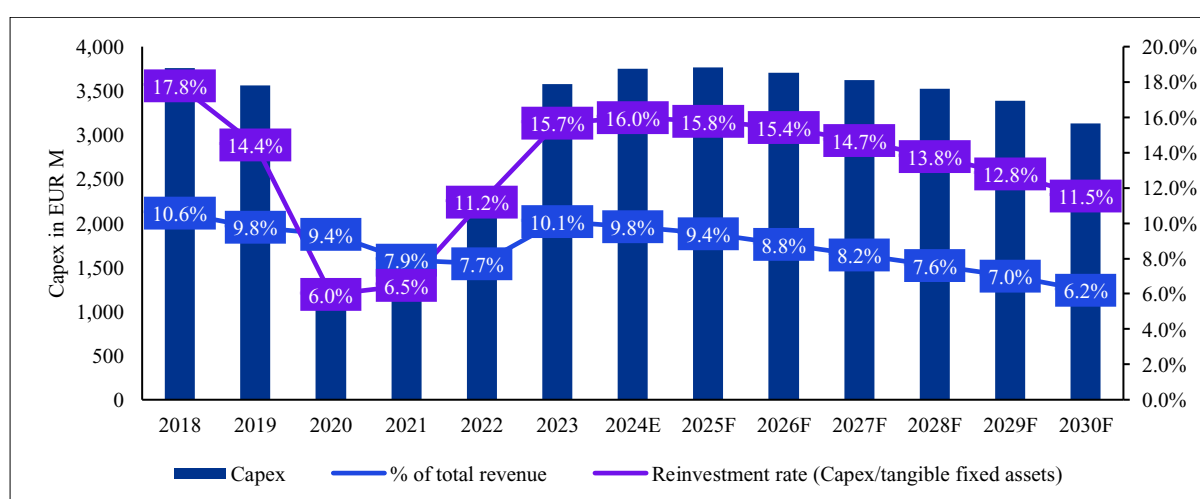


Figure 34: Capex Forecast

5.2.2 Net Debt

Lufthansa's debt position consists of bonds, bank liabilities, aircraft financing, credit lines, leasing liabilities, and other financial debts. In FY19, the debt position increased significantly by 138.9% primarily due to the initial application of IFRS 16. Net indebtedness, calculated by subtracting cash, cash equivalents, and securities from total debt, decreased from EUR 9.02bn in 2021 to EUR 5.68bn in 2023, aligning with Lufthansa's objective to reduce net indebtedness. During the forecast period, financial debt is projected to further decrease, following the latest trend and Lufthansa's strategic plan (Appendix 8). Conversely, leasing liabilities are expected to increase slightly, reflecting Lufthansa's plan to raise the proportion of leased aircraft. Cash and cash equivalents, as well as the securities position, are forecasted based on a rolling average and are projected to remain relatively constant. Lufthansa intends to maintain liquid funds between EUR 8bn and EUR 10bn to protect against potential crises.

Overall, net debt is projected to decrease at a CAGR of 5.48% during the explicit forecast period.

	2018	2019	2020	2021	2022	2023	2024E	2025F	2026F	2027F	2028F	2029F	2030F
Financial debt	3,003	7,175	12,745	13,946	12,728	11,379	10,469	10,155	9,850	9,604	9,364	9,176	8,993
% growth		138.9%	77.6%	9.4%	-8.7%	-10.6%	-8.0%	-3.0%	-3.0%	-2.5%	-2.5%	-2.0%	-2.0%
Lease debt	3,721	2,872	2,637	2,743	2,444	2,568	2,671	2,751	2,806	2,862	2,891	2,920	2,949
% growth		-22.8%	-8.2%	4.0%	-10.9%	5.1%	4.0%	3.0%	2.0%	2.0%	1.0%	1.0%	1.0%
Cash & cash equivalents	1,500	1,415	1,806	2,307	1,790	1,865	1,781	1,827	1,896	1,911	1,845	1,854	1,852
% growth		-5.7%	27.6%	27.7%	-22.4%	4.2%	-4.5%	2.6%	3.8%	0.8%	-3.5%	0.5%	-0.1%
Securities	1,735	1,970	3,654	5,359	6,511	6,400	6,090	6,334	6,275	6,233	6,280	6,263	6,259
% growth		13.5%	85.5%	46.7%	21.5%	-1.7%	-4.8%	4.0%	-0.9%	-0.7%	0.8%	-0.3%	-0.1%
Net debt	3,489	6,662	9,922	9,023	6,871	5,682	5,269	4,745	4,485	4,322	4,129	3,979	3,831
% growth		90.9%	48.9%	-9.1%	-23.9%	-17.3%	-7.3%	-10.0%	-5.5%	-3.6%	-4.5%	-3.6%	-3.7%

Figure 35: Net Debt Forecast

5.2.3 Operating Working Capital

Lufthansa's operating working capital has consistently been negative in recent years, with short-term liabilities surpassing short-term assets. This negative working capital is typical for the airline industry, where advance ticket sales create high deferred revenue. Lufthansa uses this cash flow structure to effectively fund its operations, reducing the need for external financing. This trend is expected to continue in the near-term future, with a gradual deceleration in the expansion of negative working capital, eventually leading to stabilization. Most working capital positions have remained relatively stable as a percentage of revenue both pre- and post-pandemic, with significant deviations only occurring during 2020 and 2021 due to the pandemic. Moving forward, working capital line items are forecasted in line with pre- and post-pandemic levels. An overview of historical and forecasted working capital items is presented in Appendix 11.

6 Valuation of Lufthansa

The primary valuation method used for Lufthansa is the discounted cash flow method, as it is well-suited for a mature company with predictable cash flows and steady growth prospects. The DCF valuation provides a comprehensive view of Lufthansa's intrinsic value by analyzing its future cash flows, which are essential for an asset-intensive industry like aviation. This valuation will be cross-referenced with outcomes from the APV method and relative valuation to ensure robustness and accuracy. The valuation is conducted from the standpoint of May 31, 2024. Alternative valuation methods, such as the DDM, were considered but deemed unsuitable due to Lufthansa's unstable dividend history.

6.1 DCF Valuation

The following chapter will start with a detailed classic DCF valuation, followed by the APV and relative valuation.

6.1.1 WACC

The cost of equity is computed using the CAPM, which is a function of the risk-free rate, beta, and market risk premium, as detailed in section 2.1.1.

For the risk-free rate in the CAPM calculation, the yield on the 10-year German government bond, currently at 2.52% was used. This maturity is a standard proxy for risk-free rates because it aligns with the long-term investment horizon typical in the stock market and reflects the high credit quality and stability of German government bonds. This ensures that the risk-free rate serves as a suitable benchmark for long-term equity investments.

To estimate the beta for Lufthansa, a peer group of companies within the airline industry is assembled. This peer group includes three legacy carriers (Air France-KLM, IAG, American Airlines) and two low-cost carriers (EasyJet, Ryanair) to reflect the mix of Lufthansa's business model. Four of the five peers are headquartered in Europe, making them direct competitors in Lufthansa's home market. American Airlines was included due to its status as one of the world's leading airlines, comparable to Lufthansa in size, growth, and business model, and competing with Lufthansa on international routes. These peers are primarily the ones mentioned by Lufthansa itself as competitors and typically used for peer groups among analysts. However, it is important to look at key metrics and KPIs in detail to ensure comparability.

Appendix 14 presents a comparison of these peers with Lufthansa in terms of market cap, financial and performance metrics (5-year revenue growth, operating and net profit margin), financial structure (debt-to-capital ratio), and operating KPIs (passenger load factor and number of planes in service). These categories provide insights into the financial health, profitability, and operational efficiency of each airline.

The beta factors for the peers are calculated using five years of weekly stock returns from Refinitiv, along with market returns for the same period. Air France-KLM is benchmarked against the STOXX Europe 600, easyJet, IAG, and Ryanair are compared to the FTSE 100, and American Airlines is compared to the Nasdaq Composite. The resulting peer betas are then unlevered using the firm's respective market value debt-to-equity ratios and their country-specific tax rates, which were retrieved from the OECD website.

Peer Group - Beta Calculation					
	Beta	D/E (Market)	Tax rate	Unlevered beta	
Air France-KLM SA	1.42	4.66	26%	0.32	
easyJet plc	1.92	0.86	25%	1.17	
International Consolidated Airlines Group S.A.	1.93	5.62	25%	0.37	
Ryanair Holdings plc	1.32	0.13	25%	1.20	
American Airlines Group Inc.	1.41	3.35	21%	0.39	

Table 2: Peer Group Beta Calculation

To determine the beta for Lufthansa, the average of the unlevered betas of the peer group was calculated and then re-levered using Lufthansa's debt-to-equity ratio. This ratio was derived from Lufthansa's market capitalization as of May 19, 2024, and total debt figures for Q1 2024. Additionally, the applicable tax rate was factored into the calculation. This calculation results in a final beta of 1.42.

Additionally, the direct beta for Lufthansa is calculated by regressing Lufthansa's weekly stock returns over the past five years against STOXX Euro 600 weekly returns (Appendix 12), resulting in a beta of 1.36. To derive a robust and balanced estimate that captures both Lufthansa-specific risks and broader industry trends, the final beta is calculated as the average of the two betas, yielding in a final beta of 1.39. According to Damodaran (2024), the average industry beta for air transport is 1.27.

Beta Calculation Lufthansa	
Peer Group Approach	1.417758862
Direct Approach	1.362743845
Average	1.390251354

Table 3: Lufthansa Beta Output

The market risk premium is calculated using historical daily returns from the last 10 years of the STOXX Europe 600, subtracting the daily returns of 10-year German government bonds, which serve as a proxy for the risk-free rate. The STOXX Europe 600 index is used because it represents the largest companies across various industries in Europe, providing broad market coverage and diversification. Additionally, Lufthansa is included in this index. The average of daily differences in returns was annualized by multiplying by 252 (the number of trading days in a year), resulting in a historical market risk premium of 5.82%

Cost of Equity		
Components		Notes
Risk Free Rate	2.52%	10Y Bund
Market Risk Premium	5.82%	STOXX Euro 600 less BUND last 10y
Beta	1.42	
Cost of Equity	10.77%	

Table 4: Cost of Equity Calculation

To estimate Lufthansa's cost of debt, the average yields of its publicly traded bonds with various maturities are used as a proxy. This approach captures a comprehensive range of maturities, specifically covering the years from 2024 to 2029. This period aligns closely with the company's borrowings maturity profile (Appendix 13), where the majority of borrowings mature until 2029, except for two secured aircraft finance contracts that mature in 2030 and 2031. Consequently, the average yields obtained provide a reliable and realistic measure of Lufthansa's borrowing costs, effectively reflecting the market's assessment of the associated risks across various maturities.

Tenor	Yield
1Y	4.03%
2Y	3.93%
3Y	3.88%
4Y	3.88%
5Y	3.92%
6Y	3.99%
Average	3.94%

Table 5: Issuer Curve Debt Instruments Finally, the debt and equity weights need to be determined to calculate the WACC. The market value of equity is assumed to be equal to the current market capitalization of approximately EUR 7.8bn as of May 19, 2024. For simplicity, the most recent book value of debt as of Q1 2024 was assumed to be close to market value. This assumption is based on the fact that Lufthansa's bonds trade close to par and the firm has a low probability of default. Additionally, other debt obligations relate to aircraft leases and aircraft financing, where the underlying assets have substantial value, thus lowering the risk and supporting the use of book values as a reasonable proxy for market values.

For the calculation of the financing structure in the WACC calculation, net debt is used instead of gross debt. As noted in section 5.2.2, Lufthansa plans to maintain a substantial portion of cash and short-term securities to mitigate future risks. This liquidity position constitutes nearly 60% of total debt. Consequently, these funds could be readily used to pay off debt, making net debt a more accurate reflection of the company's true financial risk. The tax rate assumption of 25% is in line with Lufthansa's assumption as stated in the 2023 annual report.

Plugging all inputs into the formula yields a WACC of 7.57%.

WACC Calculation	
Net Debt	5,531
Equity	7,979
Net Debt + Equity	13,510
Debt Weight	40.94%
Equity Weight	59.06%
Cost of Equity	10.77%
Cost of Debt	3.94%
Tax Rate	25.00%
WACC	7.57%

Table 6: WACC Calculation

6.1.2 Free Cash Flow

The calculation of free cash flow to the firm is derived from the forecasted financial items discussed in section 5. The foundation for the FCFF begins with the after-tax EBIT. From this figure, adjustments are made by subtracting the change in operating working capital and Capex spend. Additionally, D&A are added back to the after-tax EBIT, as these represent non-cash charges related to asset usage.

The resultant free cash flows are subsequently discounted using the previously determined WACC. Since the valuation is conducted as of May 31, 2024, the discount periods must be adjusted accordingly. The first year's cash flow is discounted for 0.59 years, reflecting the partial year from the valuation date to the end of 2024. Additionally, the first year's cash flow is adjusted by multiplying it by 0.59 to reflect the partial year. The cash flow for the full year 2025 is discounted over a period of 1.59 years, and this pattern continues for subsequent years.

Consolidated Free Cash Flow € in millions	2024E	2025F	2026F	2027F	2028F	2029F	2030F	TV
Total Revenue	38,263	40,041	42,089	44,185	46,326	48,356	50,477	
% change	8.0%	4.6%	5.1%	5.0%	4.8%	4.4%	4.4%	
EBIT	1,492	1,948	2,188	2,264	2,554	2,695	2,859	
After tax EBIT	1,119	1,461	1,641	1,698	1,916	2,021	2,144	
(-) Δ OWC	-276	-87	-125	-48	-15	52	144	
(-) CapEx	3,750	3,764	3,704	3,623	3,521	3,385	3,130	
(+) D&A	2,436	2,483	2,506	2,578	2,672	2,767	2,839	
FCFF	81	268	568	701	1,082	1,352	1,710	28,578
% change in FCFF		230.2%	112.3%	23.5%	54.2%	25.0%	26.5%	
PV (FCFF)	46	238	470	540	774	899	1,057	17,667

Table 7: DCF - FCFF Forecast

6.1.3 Terminal Value

The terminal value of Lufthansa is calculated using the two most common approaches: the perpetual growth method and an exit multiple. Estimating a realistic long-term growth rate is crucial, as the terminal value and, therefore, the overall valuation of the company is highly sensitive to this rate. The growth rate should be sustainable, reflecting the perpetual growth potential of the company. According to Damodaran (2012), as a firm matures, it becomes increasingly challenging to maintain high growth rates, and it will eventually grow at a rate equal to or less than the overall economy in which it operates. While the air traffic market is forecasted to grow at an annual rate of 3.6% through 2042 (Airbus, 2023), it is unrealistic to assume that Lufthansa can sustain such a high growth rate indefinitely. The airline industry is highly competitive and subject to significant economic and regulatory pressures, which constrain long-term growth potential. Therefore, a conservative long-term stable growth rate of 1.5% is assumed.

Using the perpetual growth method, the terminal value for Lufthansa is calculated to be EUR 28.58bn. This terminal value is then discounted using the WACC and added to the sum of discounted cash flows. The resulting total enterprise value from the perpetual growth approach is EUR 21.70bn.

The second approach uses an EBITDA exit multiple, assuming the company will be sold at the end of the explicit forecast period. This multiple, derived from a weighted peer group introduced in the relative valuation section, is set at 5x EBITDA. While this is above the current F12M peer group weighted EBITDA multiple, it reflects the expectation that the current valuation levels in the airline industry, which are historically low due to the pandemic, will increase and return to normal levels. This results in a discounted terminal value of EUR 17.61bn, slightly below the perpetual growth present value of EUR 17.67bn. Consequently, the final enterprise value using the exit multiple approach amounts to EUR 21.64bn.

6.1.4 Implied Share Price

After computing the enterprise value using the DCF method, the equity value and the implied share price can be determined. To transition from enterprise value to equity value, debt and debt-like items must be subtracted, and excess cash and equivalents added. Additionally, minority interest and investments in associates need to be subtracted. This results in a final equity value of EUR 11.48bn for the perpetual growth approach and EUR 11.43bn for the exit multiple approach. Dividing these equity values by the number of outstanding shares, which totals 1,196 million, yields a share price of EUR 9.61 for the perpetual growth approach and EUR 9.56 for the exit multiple approach. The calculated share prices present significant upside potential for investors compared to the current share price (May 13, 2024), as well as last three-month average share price.

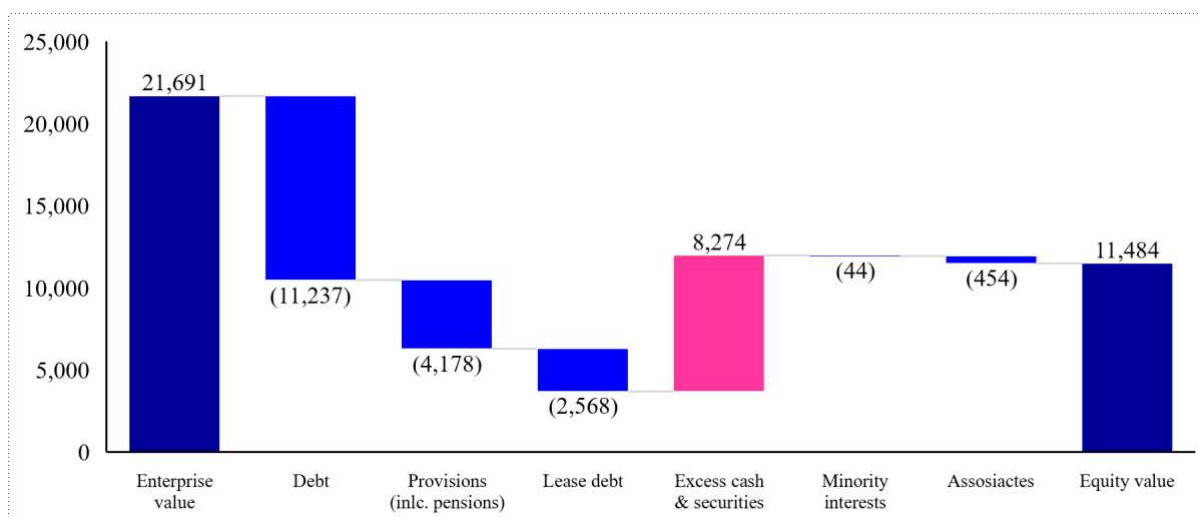


Figure 36: Enterprise Value to Equity Bridge

Enterprise Value to Equity Value Calculation	
Total Enterprise Value (exit multiple)	21,636
Total Enterprise Value (perpetual growth)	21,691
(-) Debt	11,237 as of Q1 2024
(-) Provisions (incl. pensions)	4,178 as of Q1 2024
(-) Lease debt	2,568 as of Q1 2024
(+) Excess Cash	8,274 as of Q1 2024
(-) Minority interests	44 as of Q1 2024
(-) Assosiactes	454 as of Q1 2024
Equity Value (exit multiple)	11,429
Equity Value (perpetual growth)	11,484

Table 8: Enterprise to Equity Value

Share Price Calculation	
Share Price (exit multiple)	9.56
Share Price (perpetual growth)	9.61

Table 9: DCF - Share Price Calculation

Upside/Downside Potential	
Share Price (13.05.2024)	6.81
Upside (exit multiple)	40.4%
Upside (perpetual growth)	41.1%
Share Price (L3M Average)	6.98
Upside (exit multiple)	37.0%
Upside (perpetual growth)	37.6%

Table 10: Upside/Downside Potential to Current Share Price

6.2 APV Valuation

The second valuation method used to determine the intrinsic value of Lufthansa is the APV approach. For this method, the same inputs are used as for the regular DCF. However, in the APV approach, the free cash flows are discounted at the unlevered cost of equity, which is

8.67%. The 2024 free cash flow is also adjusted by multiplying it by 0.59 to account for the remaining time from valuation date to end of 2024. For the APV terminal value calculation, the perpetual growth method is used, and a growth rate of 1.5% is applied, in line with regular DCF assumptions.

Unlevered Cost of Equity Calculation	
Unlevered cost of equity	8.67%
Levered cost of equity	10.77%
Debt weight	40.94%
Cost of debt	3.94%
Tax rate	25%

Table 11: Unlevered Cost of Equity Calculation

	0.59	1.59	2.59	3.59	4.59	5.59	6.59	
Consolidated Free Cash Flow € in millions	2024E	2025F	2026F	2027F	2028F	2029F	2030F	TV
FCFF	81	268	568	701	1,082	1,352	1,710	24,186
% change FCFF		230.2%	112.3%	23.5%	54.2%	25.0%	26.5%	
Cost of Equity	8.7%	8.7%	8.7%	8.7%	8.7%	8.7%	8.7%	8.7%
PV (FCFF)	45	234	458	520	738	849	988	13,980

Table 12: APV - Free Cash Flow Calculation

Next, the present value of tax shield benefits is calculated by multiplying the average debt per period by the marginal tax rate and the cost of debt. These tax shield benefits are then discounted using the cost of debt. The sum of the present value of the interest tax shield is subsequently added to the enterprise value.

Interest Tax Shield € in millions	2024E	2025F	2026F	2027F	2028F	2029F	2030F	TV
Total Debt (avg. t & t-1)	10,924	10,312	10,002	9,727	9,484	9,270	9,085	
Marginal tax rate	25%	25%	25%	25%	25%	25%	25%	
Cost of Debt	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%
Interest tax shield	107	101	98	96	93	91	89	3,725
PV (ITS)	62	95	89	83	78	74	69	2,888

Table 13: Tax Shield Benefits Calculation

Finally, the potential cost of bankruptcy must be determined and subtracted from the enterprise value. The probability of default obtained from Refinitiv's structural credit risk model, is 0.18%. For bankruptcy costs, both direct and indirect expenses are considered, as discussed in section 2.1.2. Given the capital-intensive nature of the airline industry, bankruptcy costs are assumed to be 25% of the unlevered firm value.

Inputs	
Unlevered cost of equity	8.67%
Perpetual growth	1.5%
Perpetual growth ITS	1.5%
Probability of default	0.18%
Bankruptcy cost	25%
Number of shares outstanding (mm)	1,196
APV EV Calculation	
Unlevered Enterprise Value	17,814
(+) PV (Interest tax shield)	3,439
(-) Bankruptcy cost	8.02
Levered Enterprise Value	21,244
(-) Debt	11,237 as of Q1 2024
(-) Provisions (incl. pensions)	4,178 as of Q1 2024
(-) Lease debt	2,568 as of Q1 2024
(+) Excess cash	8,274 as of Q1 2024
(-) Minority interests	44 as of Q1 2024
(-) Associates	454 as of Q1 2024
Equity Value	11,037
Implied share price	9.23
Upside/Downside Potential	
Share Price (13.05.2024)	6.81
Upside (Perpetual Growth)	35.6%
Share Price (L3M Average)	6.98
Upside (Perpetual Growth)	32.3%

Table 14: APV - Inputs, EV-Equity Bridge, Comparison with Current Share Price

The APV approach yields a levered enterprise value of EUR 21.24bn. After adjusting for the relevant items, the equity value is calculated to be EUR 11.04bn, corresponding to an implied share price of EUR 9.23. This implied share price indicates significant upside potential compared to the current share price and the average share price over the past three months.

6.3 Relative Valuation

In addition to the present value methods used to value Lufthansa, a comparable company analysis (CCA) is conducted. The rationale behind this approach is to capture potential hidden information and market sentiment reflected in the valuations of peer companies that may not be fully accounted for in Lufthansa's intrinsic valuation. To accurately represent Lufthansa's business segments, three distinct peer groups are assembled: airline companies, logistics companies, and companies specialized in MRO services. Appendices 14, 15, and 16 present a detailed overview of key metrics and KPIs to compare certain characteristics of the peers with Lufthansa.

For the companies within these peer groups, the 12-month forward EV/Sales, EV/EBITDA, and P/E multiples are retrieved from Refinitiv. The median of these multiples in each peer group is used for further calculation. The final multiples are then weighted by the external revenue Lufthansa reported in each business segment for FY23. These weighted multiples are applied to the respective forecasted financial metrics for next twelve months of Lufthansa.

Peer Group	Weight	EV/Sales	EV/EBITDA	P/E
Airlines	78%	0.5x	3.0x	5.4x
Logistics	8%	0.9x	6.6x	14.8x
MRO	14%	1.6x	10.8x	17.9x
Weighted Multiple		0.6x	4.4x	7.9x
Implied Enterprise Value		24,803	18,087	19,346
Implied Equity Value		14,596	7,880	9,139
Implied Share Price		12.21	6.59	7.64

Table 15: Implied Share Price Calculation using Multiples

	Sales	EBITDA	P/E
FY2024E	38,263	3,928	1,032
Fraction factor	0.59	0.59	0.59
Attributable FY24	22,433	2,303	605
FY2025F	40,041	4,431	1,335
Fraction factor	0.41	0.41	0.41
Attributable FY25	16,565	1,833	552
F12M	38,998	4,136	1,157

Table 16: F12M Calculation

The analysis reveals that the EV/Sales multiple yields the highest implied share price of EUR 12.21, followed by the P/E multiple at EUR 7.64. The EV/EBITDA multiple results in the lowest implied share price of EUR 6.59. These results deviate from the intrinsic valuations of classic DCF and APV models, which is not surprising in the case of Lufthansa.

F12M multiples reflect short-term trends and sentiment. Lufthansa is projecting weak earnings in 2024 and possibly 2025, leading to lower valuations with P/E and EV/EBITDA multiples. In contrast, revenue growth expectations explain the higher EV/Sales valuation. Intrinsic valuation models like DCF capture long-term trends and potential, giving less weight to short-term weak results, thus providing a more comprehensive view of Lufthansa's intrinsic value.

Company	Company Set	EV/Sales F12M	EV/EBITDA F12M	P/E F12M
Airlines				
Air France-KLM SA		0.3x	2.0x	2.8x
easyJet plc		0.3x	2.3x	6.8x
Ryanair Holdings plc			4.3x	8.0x
American Airlines Group Inc.		0.7x	6.4x	5.4x
International Consolidated Airlines Group S.A		0.6x	3.0x	4.2x
25th percentile		0.3x	2.3x	4.2x
Mean		0.5x	3.6x	5.4x
Median		0.5x	3.0x	5.4x
75th percentile		0.6x	4.3x	6.8x

Table 17: Airlines Segment Peer Group

Company	Company Set	EV/Sales F12M	EV/EBITDA F12M	P/E F12M
Logistics				
Deutsche Post AG		0.8x	6.2x	12.6x
FedEx Corporation		0.9x	7.0x	12.3x
United Parcel Service, Inc.		1.6x	10.7x	16.9x
S.F. Holding Co., Ltd.		0.6x	5.8x	18.1x
25th percentile		0.8x	6.1x	12.5x
Mean		1.0x	7.4x	15.0x
Median		0.9x	6.6x	14.8x
75th percentile		1.1x	7.9x	17.2x

Table 18: Logistics Segment Peer Group

Company	Company Set	EV/Sales F12M	EV/EBITDA F12M	P/E F12M
MRO				
Singapore Technologies Engineering Ltd		1.6x	11.2x	18.1x
MTU Aero Engines AG		1.7x	10.3x	17.7x
Bombardier Inc.		1.1x	6.4x	11.2x
Airbus SE		1.5x	11.2x	21.9x
25th percentile		1.4x	9.3x	16.1x
Mean		1.5x	9.8x	17.2x
Median		1.6x	10.8x	17.9x
75th percentile		1.6x	11.2x	19.1x

Table 19: MRO Segment Peer Group

6.4 Sensitivity Analysis & Valuation Summary

To derive a final target share price for Lufthansa as of May 31, 2024, the valuation outputs from the two intrinsic valuation models, the classic DCF and the APV, are further analyzed. A sensitivity analysis is performed to evaluate the impact of key input factors on the implied share price. For the classic DCF model, the sensitivity of the WACC is tested in combination with the terminal growth rate and the exit multiple.

		WACC				
		7.77%	7.67%	7.57%	7.47%	7.37%
TV Growth	1.25%	8.36	8.67	8.99	9.32	9.66
	1.38%	8.64	8.96	9.29	9.63	9.99
	1.50%	8.93	9.26	9.61	9.96	10.33
	1.63%	9.24	9.58	9.93	10.30	10.68
	1.75%	9.55	9.91	10.28	10.66	11.06

Table 20: DCF - Sensitivity Analysis: WACC vs. TV Growth

		WACC				
		7.77%	7.67%	7.57%	7.47%	7.37%
Exit Multiple	4.8x	8.77	8.87	8.97	9.07	9.18
	4.9x	9.06	9.16	9.27	9.37	9.47
	5.0x	9.35	9.46	9.56	9.67	9.77
	5.1x	9.64	9.75	9.85	9.96	10.07
	5.2x	9.93	10.04	10.15	10.26	10.37

Table 21: DCF - Sensitivity Analysis: WACC vs. EBITDA Exit Multiple

For the perpetual growth method, the implied share price ranges from EUR 8.36 to EUR 11.06. In contrast, the EBITDA exit multiple approach yields a final share price range between EUR 8.77 and EUR 10.37.

Similarly, a sensitivity analysis is conducted for the APV approach, testing the sensitivity of the unlevered cost of equity against the FCFF terminal value growth rate and the interest tax shield terminal value growth rate.

		Unlevered Cost of Equity				
		8.87%	8.77%	8.67%	8.57%	8.47%
TV Growth	1.3%	8.36	8.58	8.81	9.05	9.29
	1.4%	8.55	8.78	9.02	9.26	9.51
	1.50%	8.75	8.99	9.23	9.48	9.74
	1.63%	8.96	9.20	9.45	9.71	9.98
	1.75%	9.17	9.43	9.68	9.95	10.23

Table 22: APV - Sensitivity Analysis: Unlevered Cost of Equity vs. TV Growth

		Unlevered Cost of Equity				
		8.87%	8.77%	8.67%	8.57%	8.47%
ITS Growth	1.3%	8.56	8.80	9.04	9.30	9.55
	1.4%	8.65	8.89	9.13	9.39	9.64
	1.50%	8.75	8.99	9.23	9.48	9.74
	1.60%	8.86	9.09	9.34	9.59	9.85
	1.70%	8.97	9.21	9.45	9.70	9.96

Table 23: APV - Sensitivity Analysis: Unlevered Cost of Equity vs. ITS Growth

The implied share price range for the sensitivity table concerning terminal value FCFF growth is broader than that for terminal value ITS growth. This difference is expected, as free cash flows are significantly greater than interest tax shields, thus contributing more substantially to the enterprise value. Combining the results from both tables, the implied share price ranges from a minimum of EUR 8.36 to a maximum of EUR 10.23.

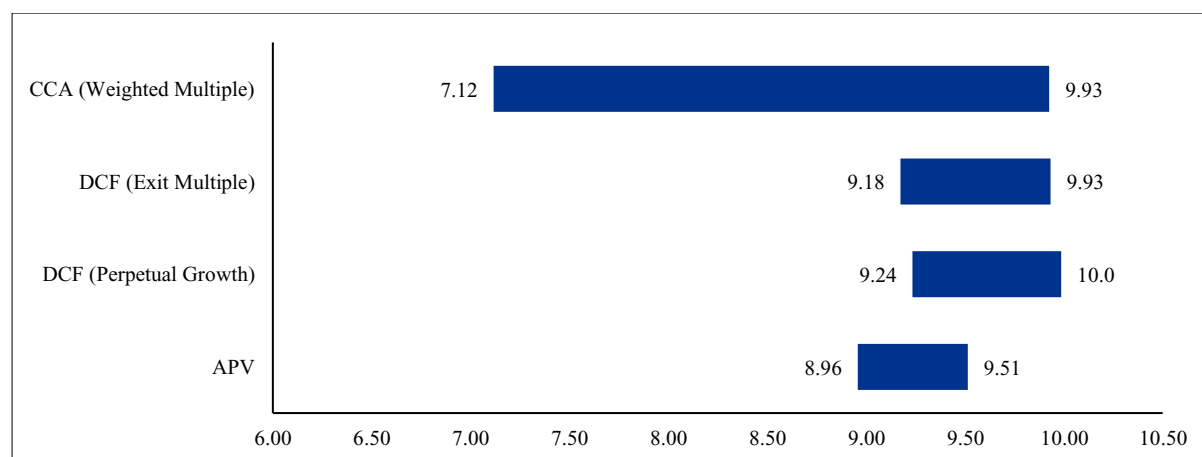


Figure 37: Valuation Football Field using Case Scenarios

The final share price recommendation is based on the average of the APV share price and the average of the DCF perpetual growth and DCF exit multiple approaches. This results in a fair share price as of May 31, 2024, of EUR 9.41. This price represents an attractive investment opportunity, being 38.18% above the current share price (May 13, 2024) of EUR 6.81 and 34.77% higher than the last three-month average share price of EUR 6.98.

A detailed valuation output summary is presented in Appendix 17.

Despite the significant upside potential indicated by this analysis, and the support from many analysts, Lufthansa's stock has continued to decline in recent months. While the mid-term growth prospects for Lufthansa remain positive, substantial strike related costs in Q1 2024 have diminished the ambitious profitability targets set for the year. Consequently, this has worsened sentiment about the stock among investors.

7 Comparison of Valuation Estimates with Analyst's Equity Research Reports

After setting a price target based on the fair value of Lufthansa stock as of May 31, 2024, this target, along with the model inputs, is compared with two analysts' reports: one from the research company Alpha Value and the other from investment bank Barclays. Both research reports suggest that the stock is undervalued, setting price targets at EUR 8.48 and EUR 9.08,

respectively, based on DCF analyses. Both reports use a detailed forecast period of three years, which is why key financial metrics are compared only for the first three years.

The WACC used in the DCF models differs significantly, with Barclays using 6.2% and Alpha Value using 8.98%. The higher WACC for Alpha Value is driven by a high cost of debt, assuming a 3.5% risk-free rate and a 500 basis points spread, which appears high compared to Lufthansa's bond yields or the synthetic credit rating spread published by Damodaran.

Both reports assume strong revenue growth consistent with this analysis. However, their forecasts for EBITDA, EBIT, net income, and respective margins are higher than those calculated in this analysis. This discrepancy is likely due to the longer explicit forecast period in this analysis, which includes a challenging year in 2024 for Lufthansa, followed by improving earnings over the subsequent six years. The other reports, with only a 3-year explicit forecast predict better near-term earnings figures to apply the terminal value sooner.

A similar situation is observed with respect to Capex. While this analysis projects high Capex spending for several years, decreasing towards the end of the forecast period to reflect a steady state, the Capex values in Barclay's report seem overly optimistic. This optimism does not align with Lufthansa's current and mid-term investment needs or recent historical figures.

Despite these differences, both reports maintain a positive general outlook and provide a buy recommendation for Lufthansa, which aligns with this analysis.

		Own Analysis	Alpha Value	Barclays
Date		5/31/2024	4/29/2024	5/8/2024
Price taret	EUR	9.41	8.48	9.08
Detailed forecast	Years	7	3	3
WACC	%	7.57	8.98	6.2
Cost of Equity	%	10.77	11.70	
Cost of Debt	%	3.94	6.38	
Beta		1.39	1.63	
Risk-free rate	%	2.52	3.5	
Tax rate	%	25	25	
Perpetual growth	%	1.50	1.75	
Cost of unlevered Equity	%	8.67	8.98	
Terminal Value	€M	28,578	27,559	

Table 24: Comparison of Valuation Inputs

		2024E	2025F	2026F
Total revenue	Own Analysis	38,263	40,041	42,089
	Alpha Value	37,878	39,679	42,267
	Barclays	36,711	39,374	41,148
EBITDA	Own Analysis	3,928	4,431	4,694
	Alpha Value	4,508	5,244	5,507
	Barclays	4,639	5,381	5,575
EBITDA Margin	Own Analysis	10.27%	11.07%	11.15%
	Alpha Value	11.90%	13.22%	13.03%
	Barclays	12.64%	13.67%	13.55%
EBIT	Own Analysis	1,492	1,948	2,188
	Alpha Value	2,213	2,880	3,072
	Barclays	2,250	2,814	2,870
EBIT Margin	Own Analysis	3.90%	4.87%	5.20%
	Alpha Value	5.84%	7.26%	7.27%
	Barclays	6.13%	7.15%	6.97%
Net Income	Own Analysis	1,032	1,335	1,473
	Alpha Value	1,643	2,232	2,439
	Barclays	1,413	1,921	2,027
CAPEX	Own Analysis	3,750	3,764	3,704
	Alpha Value	2,800	3,100	3,350
	Barclays	2,413	2,413	2,413
CAPEX as % of revenue	Own Analysis	9.80%	9.40%	8.80%
	Alpha Value	7.39%	7.81%	7.93%
	Barclays	6.57%	6.13%	5.86%
Change in OWC	Own Analysis	276	87	125
	Alpha Value	869	390	279
	Barclays	523	642	531
D&A	Own Analysis	2,436	2,483	2,506
	Alpha Value	2,296	2,366	2,438
	Barclays	2,390	2,567	2,705
D&A as % of revenue	Own Analysis	6.37%	6.20%	5.95%
	Alpha Value	6.06%	5.96%	5.77%
	Barclays	6.51%	6.52%	6.57%

Table 25: Comparison of Key Financials

8 Appendix

Appendix 1: Lufthansa 10-Year-Overview

	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Revenue and result										
Total revenue	30,011	32,056	31,660	35,579	35,542	36,424	13,589	16,811	30,895	35,442
Operating expenses	30,943	33,536	31,749	35,355	35,164	37,124	20,846	20,090	33,662	35,960
Cost of materials and services	17,283	17,640	17,109	19,028	18,367	19,827	8,453	8,946	18,634	20,363
Staff cost	7,338	8,075	7,354	8,723	8,924	9,111	6,405	5,836	8,053	8,310
D&A	1,413	1,715	1,769	2,040	2,180	2,692	2,561	2,259	2,277	2,228
Other OpEx	4,909	6,106	5,517	5,564	5,693	5,494	3,427	3,049	4,698	5,059
Adj. EBITDA	-	-	3,338	5,009	5,016	4,718	-2,890	593	3,719	4,910
Adj. EBIT	1,171	1,817	1,752	2,969	2,836	2,026	-5,451	-1,666	1,520	2,682
EBIT	1,000	1,676	2,275	3,297	2,974	1,857	-7,353	-2,316	1,419	2,669
Net profit/loss	55	1,698	1,776	2,340	2,163	1,213	-6,725	-2,191	791	1,673
Key balance sheet and cash flow statement figure										
Equity ratio	13.2	18.0	20.6	25.5	25.1	24.0	3.5	10.6	19.6	21.4
Net indebtedness	3,418	3,347	2,701	2,884	3,489	6,662	9,922	9,023	6,871	5,682
Operating Cash Flow	1,977	3,393	3,246	5,368	4,109	4,030	-2,328	399	5,168	4,945
CapEx	2,773	2,568	2,231	3,529	3,805	3,666	1,312	1,356	2,425	3,609
Free Cash Flow	-297	834	1,138	2,117	288	203	-3,669	-1,049	2,526	1,846
Key profitability and value creation figures										
Adj. EBITDA margin	-	-	10.5	14.1	14.1	13.0	-21.3	3.5	12.0	13.9
EBIT margin	3.3	5.2	7.2	9.3	8.4	5.1	-54.1	-13.8	4.6	7.5
Adj. ROCE	5.4	8.3	7.0	11.9	10.6	6.6	-16.7	-7.4	7.6	13.1
Lufthansa share										
Share price year-end	9.87	10.39	8.76	21.92	14.06	11.71	7.72	6.18	7.77	8.05
EPS	0.12	3.67	3.81	4.98	4.58	2.55	-12.51	-2.99	0.66	1.40
Traffic figures										
Flights	1,001,961	1,003,660	1,021,919	1,128,745	1,163,565	1,187,728	390,263	460,029	826,603	946,132
Passengers	106.0	107.7	109.7	129.3	141.9	145.3	36.4	46.9	101.8	122.5
ASK	268,104	273,975	286,555	322,875	349,391	358,803	109,828	145,139	259,428	300,582
RSK	214,643	220,396	226,639	261,149	284,639	296,217	69,462	89,397	207,030	249,269
Passenger load factor	80.1	80.4	79.1	80.9	81.5	82.6	63.2	61.6	79.8	82.9
ACTK	14,659	14,971	15,117	15,754	16,349	17,379	10,560	11,867	14,194	15,497
RCTK	10,249	9,930	10,071	10,819	10,896	10,664	7,373	8,477	8,562	8,735
Cargo load factor	69.9	66.3	66.6	68.7	66.6	61.4	69.8	71.4	60.3	56.4
Commercial aircraft	615	600	617	728	763	763	757	712	710	721

Appendix 2: Lufthansa Historical Income Statement

Deutsche Lufthansa AG | Income Statement - Company Specific (Currency: As Reported)

Source: Refinitiv

	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Traffic revenue	24,388	25,322	24,661	28,399	27,801	28,136	9,078	11,876	25,864	29,926
Other revenue	5,623	6,734	6,999	7,180	7,741	8,288	4,511	4,935	5,031	5,516
Total revenue	30,011	32,056	31,660	35,579	35,542	36,424	13,589	16,811	30,895	35,442
Changes in inventories and other own work capitalised	-212	-203	-95	-438	-531	-685	-175	-109	-354	-727
Other operating income	-1,890	-2,832	-2,184	-2,276	-1,818	-1,889	-1,897	-1,602	-2,180	-2,413
Cost of Materials and Services	17,283	17,640	17,109	19,028	18,367	19,827	8,453	8,946	17,973	20,378
Staff Costs	7335	8075	7354	8172	8811	9121	6,436	6,328	7,277	8,344
Depreciation, amortisation and impairment	1,528	1,715	1,769	2,382	2,205	2,776	4,389	2,351	2,245	2,242
Other operating expenses	5,088	6,106	5,517	5,571	5,708	5,585	3,472	3,215	4,538	5,162
Operating (Income)/Expense - Net	29,132	30,501	29,470	32,439	32,742	34,735	20,678	19,129	29,499	32,986
Profit/loss from operating activities	879	1,555	2,190	3,140	2,800	1,689	-7,089	-2,318	1,396	2,456
Result of equity investments accounted for using the equity method	77	111	58	118	114	88	-276	-22	-15	121
Result of other equity investments	44	10	27	39	60	80	12	24	38	92
EBIT	1,000	1,676	2,275	3,297	2,974	1,857	-7,353	-2,316	1,419	2,669
Interest Income	-159	-186	-64	-178	-68	-79	-83	6	-68	-245
Interest expenses	415	356	282	373	212	394	417	435	477	593
Other financial items	564	-520	-191	-56	46	-318	944	-151	-239	4
Financial result	-699	471	58	18	-16	171	-1,542	-288	-147	-139
Profit/loss before income taxes from continuing operations	180	2,026	2,248	3,158	2,784	1,860	-8,631	-2,606	1,249	2,317
Income taxes	105	304	445	784	588	615	-1,865	-413	239	380
Profit/loss from continuing operations	75	1,722	1,803	2,374	2,196	1,245	-6,766	-2,193	1,010	1,937
Result from discontinued operations									-206	-248
Profit&loss after income taxes	75	1,722	1,803	2,374	2,196	1,245	-6,766	-2,193	804	1,689
Thereof profit/loss attributable to non-controlling interests	20	24	27	34	33	32	-41	-2	13	16
Net profit/loss attributable to shareholders of Deutsche Lufthansa AG	55	1,698	1,776	2,340	2,163	1,213	-6,725	-2,191	791	1,673
Basic/diluted earnings per share in €	0.12	3.67	3.81	4.98	4.58	2.55	-12.51	-2.97	0.66	1.40

Appendix 3: Lufthansa Historical Balance Sheet (1/2)

Deutsche Lufthansa AG | Balance Sheet - Company Specific (Currency: As Reported)

Source: Refinitiv

	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Q1 2024
Intangible assets with an indefinite useful life	1,197	1,235	1,265	1,343	1,381	1,395	1,169	1,189	1,055	1,022	1,000
Other intangible assets	390	422	472	492	512	547	469	419	373	333	317
Aircraft and spare engines	13,572	14,591	14,798	15,333	16,776	18,349	15,842	15,318	15,890	17,464	17,830
Repairable spare parts for aircraft	1,083	1,388	1,604	1,758	2,133	2,270	1,823	1,847	2,034	2,448	2,502
Property, plant and other equipment	2,109	2,173	2,199	2,186	2,221	4,041	3,671	3,354	3,331	2,913	2,830
Equity investments accounted for using the equity method	445	520	516	585	650	672	403	434	392	465	454
Other equity investments	776	201	212	221	246	256	252	245	236	233	242
Non-current securities	10	15	23	32	41	53	54	38	37	20	21
Loans, receivables and other assets	515	516	513	475	512	469	440	525	532	968	1,030
Derivative financial instruments	599	1,234	1,474	642	828	906	363	894	1,120	659	730
Deferred charges and prepaid expenses	11	12	11	9	118	116	91	74	88	79	82
Effective income tax receivables	31	19	4	12	10	32	34	65	64	109	109
Deferred tax assets	1,489	1,200	1,413	1,661	2,131	2,268	4,833	4,661	2,928	3,059	3,124
Non-current assets	22,227	23,526	24,504	24,749	27,559	31,374	29,444	29,063	28,080	29,772	30,271
Inventories	700	761	816	907	968	980	726	675	812	961	976
Contract assets	0	0	0	0	234	277	142	179	342	312	376
Trade receivables and other receivables	3,995	4,389	4,570	5,313	5,576	5,417	2,843	3,686	4,102	3,923	4,553
Derivative financial instruments	456	440	534	600	357	459	260	542	861	437	727
Deferred charges and prepaid expenses	147	158	167	197	217	245	193	208	287	235	327
Effective income tax receivables	122	85	37	58	58	153	282	249	231	307	308
Securities	1,785	1,994	2,681	2,551	1,735	1,970	3,654	5,359	6,511	6,400	7,009
Fixed-term deposits (four to twelve months)	125	103	118	179	66				6	275	
Cash and cash equivalents	828	996	1,138	1,218	1,434	1,415	1,806	2,307	1,784	1,590	1,265
Assets held for sale	89	10	132	6	9	369	134	270	319	1,109	1,546
Current Assets	8,247	8,936	10,193	11,029	10,654	11,285	10,040	13,475	15,255	15,549	17,087
Total Assets	30,474	32,462	34,697	35,778	38,213	42,659	39,484	42,538	43,335	45,321	47,358

Appendix 4: Lufthansa Historical Balance Sheet (2/2)

	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Q1 2024
Issued capital	1,185	1,189	1,200	1,206	1,217	1,224	1,530	3,060	3,060	3,063	3063
Capital reserve	170	187	222	263	343	378	378	956	252	258	258
Retained earnings	1,237	1,612	1,549	3,724	4,555	5,617	4,868	491	2,068	2,514	4409
Other neutral reserves	1,321	1,082	2,313	1,474	1,185	1,715	1,296	2,134	2,234	2,151	2534
Net result for the period	55	1,698	1,776	2,340	2,163	1,213	-6,725	-2,191	791	1,673	-734
Equity attributable to shareholders of Deutsche Lufthansa AG	3,968	5,768	7,060	9,007	9,463	10,147	1,347	4,450	8,405	9,659	9,530
Non-controlling interest	63	77	89	103	110	109	40	40	69	50	44
Shareholders' equity	4,031	5,845	7,149	9,110	9,573	10,256	1,387	4,490	8,474	9,709	9,574
Pension provisions	7,231	6,626	8,364	5,116	5,865	6,659	9,531	6,676	2,069	2,895	2644
Other Provisions	601	526	503	601	537	490	558	703	757	764	887
Other staff costs	117	120	125	145	150	159	169	160	157	166	
Environmental restoration	24	26	25	25	24	27	28	28	29	28	
Restructuring / severance payments	123	113	82	94	119	79	47	54	55	7	
Other LT Provisions	337	267	271	337	244	225	314	461	516	563	
Borrowings	5,364	5,031	5,811	6,142	5,008	8,396	12,252	15,041	13,270	11,055	10,200
Contract Liabilities	0	0	0	0	22	25	36	30	30	26	30
Other financial liabilities	136	121	124	243	137	76	86	67	72	55	47
Advance payments received, deferred income and other non-financial liabilities	1,179	1,223	1,246	1,289	51	32	33	30	44	67	66
Derivative financial instruments	719	307	54	190	222	128	457	290	394	495	337
Deferred tax liabilities	239	346	437	449	583	611	485	529	517	505	526
Non-current provisions and liabilities	15,469	14,180	16,539	14,030	12,425	16,417	23,438	23,366	17,153	15,862	14,737
Other provisions	953	1,075	1,066	990	925	794	831	1,255	872	876	868
Other staff costs	46	44	42	41	46	43	40	37	39	33	
Current Provisions	907	1,031	1,024	949	879	751	791	1,218	833	843	
Borrowings	594	1,339	764	672	1,677	1,634	3,116	1,629	1,881	2,888	3601
Trade payables and other financial liabilities	4,635	4,847	4,689	5,249	5,764	5,351	3,321	4,186	5,660	5,905	5963
Contract liabilities from unused flight documents	2,848	2,901	3,040	3,773	3,969	4,071	2,064	3,340	4,898	4,981	7289
Other contract liabilities	0	0	0	0	2,316	2,675	2,977	2,609	2,682	2,770	2753
Advance payments received, deferred income and other non-financial liabilities	924	918	875	992	388	382	1,295	648	681	722	887
Derivative financial instruments	766	1,221	185	124	393	137	366	247	489	263	146
Effective income tax obligations	228	136	390	838	783	402	689	705	545	675	684
Liabilities in connection with assets held for sale	26	0	0	0	0	540	0	63	0	670	856
Current provisions and liabilities	10,974	12,437	11,009	12,638	16,215	15,986	14,659	14,682	17,708	19,750	23,047
Total Debt & Liabilities (Current & Non-current)	26,443	26,617	27,548	26,668	28,640	32,403	38,097	38,048	34,861	35,612	37,784
Total equity and liabilities	30,474	32,462	34,697	35,778	38,213	42,659	39,484	42,538	43,335	45,321	47,358

Appendix 5: Lufthansa Historical Cash Flow Statement

Deutsche Lufthansa AG | Cash Flow - Company Specific (Currency: As Reported)

Source: Refinitiv

	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Cash and cash equivalents at start of period	1,407	828	996	1,138	1,218	1,434	1,431	1,804	2,305	1,784
Net profit/loss before income taxes from continued and discontinued operations	180	2,026	2,248	3,158	2,784	1,860	-8,631	-2,606	1,050	2,055
Depreciation, amortisation and impairment losses on non-current assets (net of reversals)	1,516	1,708	1,765	2,300	2,178	2,738	4,393	2,288	2,472	2,312
Depreciation, amortisation and impairment losses on current assets (net of reversals)	-8	82	55	39	23	99	159	-33	-28	80
Net proceeds on disposal of non-current assets	140	-53	-38	-37	-34	20	9	30	-30	144
Result of equity investments	-121	-121	-85	-157	-174	-168	264	-2	1	-223
Net interest	279	170	218	195	144	315	334	441	419	356
Income tax payments/reimbursements	-220	-197	-54	-385	-670	-1,009	81	-101	-288	-92
Significant non-cash expenses/income	0	-691	-1,037	-705	-276	-134	212	-484	-524	-264
Change in trade working capital	-202	-392	-140	259	410	490	-683	1,347	1,694	278
Change in other assets and equity and liabilities	0	861	314	701	-276	-181	1,534	-481	402	299
Measurement of financial derivatives through profit or loss	413									
Cash flow from operating activities	1,977	3,393	3,246	5,368	4,109	4,030	-2,328	399	5,168	4,945
Capital expenditure for property, plant and equipment and intangible assets	-2,699	-2,454	-2,160	-3,338	-3,709	-3,486	-1,249	-1,318	-2,365	-3,544
Capital expenditure for financial investments	-60	-91	-34	-136	-48	-73	-24	-11	-14	-32
Additions/loss to repairable spare parts of aircraft	-100	-367	-264	-210	-388	-231	276	21	-143	-506
Proceeds from disposal of non-consolidated equity investments	49	34	26	7	2	1	3	0	25	16
Proceeds from disposal of consolidated shares	0	-122	0	0	4	3	-218			
Cash outflows for disposal of consolidated equity investments								2	-4	-14
Cash outflows for acquisitions of non-consolidated shares	-14	-23	-36	-55	-48	-107	-39	-27	-46	-33
Cash outflows for acquisitions of consolidated equity investments	-4	-1	-6	191	-12	0				0
Proceeds from disposal of intangible assets, property, plant and other financial investments	161	138	94	142	146	132	166	190	154	1,029
Interest income	256	271	192	61	51	70	66	-3	37	166
Dividends Received	137	56	80	87	143	243	57	27	70	107
Net cash from/used in investing activities	-2,274	-2,559	-2,108	-3,251	-3,859	-3,448	-962	-1,119	-2,286	-2,811
Purchase of securities/fund investments	-974	-1,845	-1,302	-2,660	-3,289	-4,989	-10,678	-9,367	-6,808	-11,591
Disposal of securities/fund investments	1,758	1,131	581	905	3,879	4,570	9,298	7,681	5,653	11,421
Net cash from/used in investing and cash management activities	-1,490	-3,273	-2,829	-5,006	-3,269	-3,867	-2,342	-2,805	-3,441	-2,981
Capital increase/equity contributions	0		0		0	0	306	3,309	0	0
Capital reduction/equity repayments								-1,218	0	0
Transactions by non-controlling interests	0	2	1	1	1	1	0	0	-1	-1
Non-current borrowing	1,102	986	1,685	1,106	987	3,843	6,738	6,144	786	230
Repayment of non-current borrowing	-1,572	-682	-1,483	-967	-1,196	-3,413	-1,724	-5,070	-2,664	-1,767
Dividends Paid	-222	-14	-233	-232	-349	-414	-21	-19	-8	-25
Interest Paid	-380	-266	-242	-153	-69	-178	-223	-272	-379	-509
Net cash from/used in financing activities	-1,072	26	-272	-245	-626	-161	5,076	2,874	-2,266	-2,072
Net increase/decrease in cash and cash equivalents	-585	146	145	117	214	2	406	468	-539	-108
Changes due to currency translation differences	6	22	-3	-37	2	-5	-33	33	18	-8
Non-Classified Cash Flows						-16				
Cash and cash equivalents as of 31 Dec	828	996	1,138	1,218	1,434	1,415	1,804	2,305	1,784	1,668
Less cash and cash equivalents of companies held for sale as of 31 Dec.										78
Cash and cash equivalents of companies not held for sale as of 31 Dec	828	996	1,138	1,218	1,434	1,415	1,804	2,305	1,784	1,590
Securities	1,785	1,994	2,681	2,551	1,735	1,970	3,654	5,359	6,511	6,400
Liquidity	2,613	2,990	3,819	3,769	3,169	3,385	5,458	7,664	8,295	7,990
Net increase/decrease in liquidity		377	829	-50	-600	216	2,073	2,206	631	-305

Appendix 6: Lufthansa Fleet

Lufthansa German Airlines including regional airlines, Germanwings and Eurowings Discover (LH), SWISS incl. Edelweiss (LX), Austrian Airlines (OS), Brussels Airlines (SN), Eurowings (EW) and Lufthansa Cargo (LCAG); 1) A321P2F operated by Lufthansa CityLine, 2) Partly operated by AeroLogic, of which two aircraft attributed pro rata

Manufacturer/type	LH	LX	OS	SN	EW	LCAG	Group fleet	Of which lease	Change compared with 31 Dec 2022
Airbus A220		30					30		
Airbus A319	38			15	33		86	17	-2
Airbus A320	63	25	29	18	50		185	28	-2
Airbus A320neo	35	6	5	2	7		55	7	+11
Airbus A321	54	6	6		6	4 ¹⁾	76	4	-2
Airbus A321neo	17	4			4		25	5	+7
Airbus A330	23	14		9			46	4	-4
Airbus A340	34	9					43		
Airbus A350	23	3					26	5	+5
Airbus A380	8						8		-6
Boeing 747	27						27		
Boeing 767			3				3		
Boeing 777		12	6				18	2	
Boeing 787	5						5		+3
Boeing 777F						17 ²⁾	17	6	+1
Bombardier CRJ	28						28		
Embraer	26		17				43		
Total aircraft	381	109	66	44	100	21	721	78	+11

Appendix 7: Income Statement Forecast

	2018	2019	2020	2021	2022	2023	2024E	2025F	2026F	2027F	2028F	2029F	2030F
Traffic revenue	27,801	28,136	9,078	11,876	25,864	29,926	32,276	33,684	35,400	37,210	39,085	40,908	42,817
Other revenue	7,741	8,288	4,511	4,935	5,031	5,516	5,987	6,357	6,689	6,975	7,241	7,447	7,660
Total revenue	35,542	36,424	13,589	16,811	30,895	35,442	38,263	40,041	42,089	44,185	46,326	48,356	50,477
% growth	-0.1%	2.5%	-62.7%	23.7%	83.8%	14.7%	8.0%	4.6%	5.1%	5.0%	4.8%	4.4%	4.4%
Changes in inventories and other own work capitalised	531	685	175	109	354	727	612	731	720	781	806	848	882
% growth	21.2%	29.0%	-74.5%	-37.7%	224.8%	105.4%	-15.9%	19.5%	-1.4%	8.5%	3.2%	5.2%	4.0%
% of total revenue	1.5%	1.9%	1.3%	0.6%	1.1%	2.1%	1.6%	1.8%	1.7%	1.8%	1.7%	1.8%	1.7%
Other operating income	1,818	1,889	1,897	1,602	2,180	2,413	2,312	2,419	2,543	2,669	2,799	2,921	3,050
% growth	-20.1%	3.9%	0.4%	-15.6%	36.1%	10.7%	-4.2%	4.6%	5.1%	5.0%	4.8%	4.4%	4.4%
% of total revenue	5.1%	5.2%	14.0%	9.5%	7.1%	6.8%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%
Total other operating income	2,349	2,574	2,072	1,711	2,534	3,140	2,923	3,150	3,263	3,451	3,605	3,770	3,931
% growth	-13.4%	9.6%	-19.5%	-17.4%	48.1%	23.9%	-6.9%	7.7%	3.6%	5.7%	4.5%	4.6%	4.3%
Cost of raw materials,	9,683	10,816	4,205	4,163	9,785	10,660	11,813	12,212	12,627	13,255	13,898	14,507	15,143
% growth	10.2%	11.7%	-61.1%	-1.0%	135.0%	8.9%	10.8%	3.4%	3.4%	5.0%	4.8%	4.4%	4.4%
% of total revenue	27.2%	29.7%	30.9%	24.8%	31.7%	30.1%	30.9%	30.5%	30.0%	30.0%	30.0%	30.0%	30.0%
Cost of purchased services	8,684	9,011	4,248	4,783	8,188	9,718	11,096	11,532	12,037	12,637	13,203	13,781	14,386
% growth	-15.2%	3.8%	-52.9%	12.6%	71.2%	18.7%	14.2%	3.9%	4.4%	5.0%	4.5%	4.4%	4.4%
% of total revenue	24.4%	24.7%	31.3%	28.5%	26.5%	27.4%	29.0%	28.8%	28.6%	28.6%	28.5%	28.5%	28.5%
Cost of materials and services	18,367	19,827	8,453	8,946	17,973	20,378	22,910	23,744	24,664	25,892	27,100	28,288	29,529
% growth	-3.5%	7.9%	-57.4%	5.8%	100.9%	13.4%	12.4%	3.6%	3.9%	5.0%	4.7%	4.4%	4.4%
% of total revenue	51.7%	54.4%	62.2%	53.2%	58.2%	57.5%	59.9%	59.3%	58.6%	58.6%	58.5%	58.5%	58.5%
Staff cost	8,811	9,121	6,436	6,328	7,277	8,344	8,992	9,410	10,101	10,715	11,118	11,605	12,114
% growth	7.8%	3.5%	-29.4%	-1.7%	15.0%	14.7%	7.8%	4.6%	7.4%	6.1%	3.8%	4.4%	4.4%
% of total revenue	24.8%	25.0%	47.4%	37.6%	23.6%	23.5%	23.5%	23.5%	24.0%	24.3%	24.0%	24.0%	24.0%
D&A and impairment	2,205	2,776	4,389	2,351	2,245	2,242	2,436	2,483	2,506	2,578	2,672	2,767	2,839
% growth	-7.4%	25.9%	58.1%	-46.4%	-4.5%	-0.1%	8.6%	1.9%	0.9%	2.9%	3.6%	3.6%	2.6%
% of asset base	9.3%	10.2%	18.8%	10.4%	9.7%	9.1%	9.6%	9.6%	9.6%	9.6%	9.6%	9.6%	9.6%
% of total revenue	6.2%	7.6%	32.3%	14.0%	7.3%	6.3%	6.4%	6.2%	6.0%	5.8%	5.8%	5.7%	5.6%
Other OpEx	5,708	5,585	3,472	3,215	4,538	5,162	5,548	5,806	6,103	6,407	6,717	7,012	7,319
% growth	2.5%	-2.2%	-37.8%	-7.4%	41.2%	13.8%	7.5%	4.6%	5.1%	5.0%	4.8%	4.4%	4.4%
% of total revenue	16.1%	15.3%	25.6%	19.1%	14.7%	14.6%	14.5%	14.5%	14.5%	14.5%	14.5%	14.5%	14.5%
Total Opex	35,091	37,309	22,750	20,840	32,033	36,126	39,885	41,442	43,374	45,592	47,608	49,672	51,802
Profit/loss from operating activit	2,800	1,689	-7,089	-2,318	1,396	2,456	1,301	1,748	1,978	2,043	2,323	2,453	2,607
Result of equity investments	174	168	-264	2	23	213	191	200	210	221	232	242	252
% of total revenue	0.5%	0.5%	-1.9%	0.0%	0.1%	0.6%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%
EBIT	2,974	1,857	-7,353	-2,316	1,419	2,669	1,492	1,948	2,188	2,264	2,554	2,695	2,859
% growth	-9.8%	-37.6%	n/a	n/a	n/a	88.1%	-44.1%	30.6%	12.3%	3.5%	12.8%	5.5%	6.1%
EBIT margin	8.4%	5.1%	-54.1%	-13.8%	4.6%	7.5%	3.9%	4.9%	5.2%	5.1%	5.5%	5.6%	5.7%
Interest Exp. (Inc.), net	144	315	334	441	409	348	306	320	337	353	371	387	404
% growth	-26.2%	118.8%	6.0%	32.0%	-7.3%	-14.9%	-12.0%	4.6%	5.1%	5.0%	4.8%	4.4%	4.4%
% of total revenue	0.4%	0.9%	2.5%	2.6%	1.3%	0.98%	0.8%	0.8%	0.8%	0.8%	0.8%	0.8%	0.8%
Other financial items	46	-318	944	-151	-239	4	-212	-176	-138	-194	-186	-188	-207
% of total revenue	0.1%	-0.9%	6.9%	-0.9%	-0.8%	0.0%	-0.6%	-0.4%	-0.3%	-0.4%	-0.4%	-0.4%	-0.4%
Financial result	-16	171	-1,542	-288	-147	-139	97	55	11	62	47	43	56
Profit/loss before income taxes	2,784	1,860	-8,631	-2,606	1,249	2,317	1,398	1,803	1,989	2,105	2,370	2,496	2,662
Income taxes	588	615	-1,865	-413	239	380	349	451	497	526	592	624	666
% of profit/loss before income ta	21.1%	33.1%	21.6%	15.8%	19.1%	16.4%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%
Profit/loss from continuing operat	2,196	1,245	-6,766	-2,193	1,010	1,937	1,048	1,353	1,492	1,579	1,777	1,872	1,997
Result from discontinued operati	0	0	0	0	-206	-248	0	0	0	0	0	0	0
Profit/loss after income taxes	2,196	1,245	-6,766	-2,193	804	1,689	1,048	1,353	1,492	1,579	1,777	1,872	1,997
Profit/loss attributable to NCI	33	32	-41	-2	13	16	17	17	18	19	20	21	22
% of total revenue	0.1%	0.1%	-0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Net profit/loss attributable to sh	2,163	1,213	-6,725	-2,191	791	1,673	1,032	1,335	1,473	1,560	1,757	1,851	1,975
% growth	-7.6%	-43.9%	n/a	n/a	n/a	111.5%	-38.3%	29.4%	10.3%	5.9%	12.7%	5.4%	6.7%
Net Income margin	6.1%	3.3%	-49.5%	-13.0%	2.6%	4.7%	2.7%	3.3%	3.5%	3.5%	3.8%	3.8%	3.9%

Appendix 8: Net Debt & Pension Liabilities Forecast

	2018	2019	2020	2021	2022	2023	2024E	2025F	2026F	2027F	2028F	2029F	2030F
Financial debt	3,003	7,175	12,745	13,946	12,728	11,379	10,469	10,155	9,850	9,604	9,364	9,176	8,993
% growth		138.9%	77.6%	9.4%	-8.7%	-10.6%	-8.0%	-3.0%	-3.0%	-2.5%	-2.5%	-2.0%	-2.0%
Lease debt	3,721	2,872	2,637	2,743	2,444	2,568	2,671	2,751	2,806	2,862	2,891	2,920	2,949
% growth		-22.8%	-8.2%	4.0%	-10.9%	5.1%	4.0%	3.0%	2.0%	2.0%	1.0%	1.0%	1.0%
Cash & cash equivalents	1,500	1,415	1,806	2,307	1,790	1,865	1,781	1,827	1,896	1,911	1,845	1,854	1,852
% growth		-5.7%	27.6%	27.7%	-22.4%	4.2%	-4.5%	2.6%	3.8%	0.8%	-3.5%	0.5%	-0.1%
Securities	1,735	1,970	3,654	5,359	6,511	6,400	6,090	6,334	6,275	6,233	6,280	6,263	6,259
% growth		13.5%	85.5%	46.7%	21.5%	-1.7%	-4.8%	4.0%	-0.9%	-0.7%	0.8%	-0.3%	-0.1%
Net debt	3,489	6,662	9,922	9,023	6,871	5,682	5,269	4,745	4,485	4,322	4,129	3,979	3,831
% growth		90.9%	48.9%	-9.1%	-23.9%	-17.3%	-7.3%	-10.0%	-5.5%	-3.6%	-4.5%	-3.6%	-3.7%
Pension obligations	5,865	6,659	9,531	6,676	2,069	2,895	2,954	2,953	2,884	2,599	2,428	2,522	2,468
% growth		14.6%	13.5%	43.1%	-30.0%	-69.0%	39.9%	2.0%	-0.1%	-2.3%	-9.9%	-6.6%	-3.9%
Net Debt & pension liabilities	9,354	13,321	19,453	15,699	8,940	8,577	8,223	7,697	7,369	6,921	6,557	6,501	6,299
% growth		42.4%	46.0%	-19.3%	-43.1%	-4.1%	-4.1%	-6.4%	-4.3%	-6.1%	-5.2%	-0.9%	-3.1%
Other Provisions	1,462	1,284	1,389	1,958	1,629	1,640	1,560	1,577	1,626	1,665	1,616	1,614	1,610
% growth		-12.2%	8.2%	41.0%	-16.8%	0.7%	-4.9%	1.1%	3.1%	2.4%	-2.9%	-0.1%	-0.3%

Appendix 9: Asset Base Forecast

	2018	2019	2020	2021	2022	2023	2024E	2025F	2026F	2027F	2028F	2029F	2030F
Intangible assets with an indefinite useful life	1,381	1,395	1,169	1,189	1,055	1,022	1,053	1,084	1,117	1,150	1,185	1,220	1,257
% growth		1.0%	-16.2%	1.7%	-11.3%	-3.1%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%
Other intangible assets	512	547	469	419	373	333	356	381	408	436	467	500	535
% growth		4.1%	6.8%	-14.3%	-10.7%	-11.0%	-10.7%	7.0%	7.0%	7.0%	7.0%	7.0%	7.0%
Aircraft, spare engines and spare parts for aircraft	18,909	20,619	17,665	17,165	17,924	19,912	20,511	20,866	20,974	21,601	22,456	23,328	23,954
% growth		10.6%	9.0%	-14.3%	-2.8%	4.4%	11.1%	3.0%	1.7%	0.5%	3.0%	4.0%	3.9%
PP&E	2,221	4,041	3,671	3,354	3,331	2,913	2,957	3,001	3,046	3,077	3,107	3,138	3,170
% growth		1.6%	81.9%	-9.2%	-8.6%	-0.7%	-12.5%	1.5%	1.5%	1.5%	1.0%	1.0%	1.0%
Long term investments	650	672	403	434	392	465	498	530	562	593	616	638	657
% growth		11.1%	3.4%	-40.0%	7.7%	-9.7%	18.6%	7.0%	6.5%	6.0%	5.5%	4.0%	3.5%
Asset base for D&A and impairment	23,673	27,274	23,377	22,561	23,075	24,645	25,374	25,863	26,106	26,857	27,832	28,825	29,572
% growth		9.1%	15.2%	-14.3%	-3.5%	2.3%	6.8%	3.0%	1.9%	0.9%	2.9%	3.6%	3.6%

Appendix 10: Capex Forecast

	2018	2019	2020	2021	2022	2023	2024E	2025F	2026F	2027F	2028F	2029F	2030F
Capex	3,757	3,559	1,273	1,329	2,379	3,576	3,750	3,764	3,704	3,623	3,521	3,385	3,130
% growth		2.0%	-5.3%	-64.2%	4.4%	79.0%	50.3%	4.9%	0.4%	-1.6%	-2.2%	-2.8%	-3.9%
% of D&A	170.4%	128.2%	29.0%	56.5%	106.0%	159.5%	153.9%	151.6%	147.8%	140.5%	131.8%	122.3%	110.2%
% of total revenue	10.6%	9.8%	9.4%	7.9%	7.7%	10.1%	9.8%	9.4%	8.8%	8.2%	7.6%	7.0%	6.2%
Reinvestment rate (Capex/tangible fixed assets)	17.8%	14.4%	6.0%	6.5%	11.2%	15.7%	16.0%	15.8%	15.4%	14.7%	13.8%	12.8%	11.5%
Net Capex	1,552	783	-3,116	-1,022	134	1,334	1,314	1,281	1,198	1,045	849	618	291

Appendix 11: OWC Forecast

	2018	2019	2020	2021	2022	2023	2024E	2025F	2026F	2027F	2028F	2029F	2030F
Inventories	907	968	980	726	675	812	880	921	1,052	1,105	1,158	1,257	1,312
%growth	11.2%	6.7%	1.2%	-25.9%	-7.0%	20.3%	8.4%	4.6%	14.3%	5.0%	4.8%	8.6%	4.4%
% of total revenue	2.6%	2.7%	7.2%	4.3%	2.2%	2.3%	2.3%	2.3%	2.5%	2.5%	2.5%	2.6%	2.6%
Contract assets	234	277	142	179	342	312	352	386	419	437	452	461	488
%growth		18.4%	-48.7%	26.1%	91.1%	-8.8%	12.7%	9.6%	8.8%	4.1%	3.5%	2.0%	5.7%
% of total revenue	0.7%	0.8%	1.0%	1.1%	1.1%	0.9%	0.9%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%
Trade receivables and other receivables	5,576	5,417	2,843	3,686	4,102	3,923	4,592	4,885	5,219	5,567	5,930	6,286	6,764
%growth	5.0%	-2.9%	-47.5%	29.7%	11.3%	-4.4%	17.0%	6.4%	6.8%	6.7%	6.5%	6.0%	7.6%
% of total revenue	15.7%	14.9%	20.9%	21.9%	13.3%	11.1%	12.0%	12.2%	12.4%	12.6%	12.8%	13.0%	13.4%
Derivative financial instruments	357	459	260	542	861	437	472	494	519	545	571	596	622
%growth	-40.5%	28.6%	-43.4%	108.5%	58.9%	-49.2%	8.0%	4.6%	5.1%	5.0%	4.8%	4.4%	4.4%
% of total revenue	1.0%	1.3%	1.9%	3.2%	2.8%	1.2%	1.2%	1.2%	1.2%	1.2%	1.2%	1.2%	1.2%
Deferred charges and prepaid expenses	217	245	193	208	287	235	254	265	279	293	307	321	335
%growth	10.2%	12.9%	-21.2%	7.8%	38.0%	-18.1%	8.0%	4.6%	5.1%	5.0%	4.8%	4.4%	4.4%
% of total revenue	0.6%	0.7%	1.4%	1.2%	0.9%	0.7%	0.7%	0.7%	0.7%	0.7%	0.7%	0.7%	0.7%
Effective income tax receivables	58	153	282	249	231	307	331	347	365	383	401	419	437
%growth	56.8%	163.8%	84.3%	-11.7%	-7.2%	32.9%	8.0%	4.6%	5.1%	5.0%	4.8%	4.4%	4.4%
% of total revenue	0.2%	0.4%	2.1%	1.5%	0.7%	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%
Other provisions	925	794	831	1,255	872	876	946	990	1,040	1,092	1,145	1,195	1,248
%growth	-6.6%	-14.2%	4.7%	51.0%	-30.5%	0.5%	8.0%	4.6%	5.1%	5.0%	4.8%	4.4%	4.4%
% of total revenue	2.6%	2.2%	6.1%	7.5%	2.8%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%
Trade payables	5,764	5,351	3,321	4,186	5,660	5,905	6,313	6,607	6,818	7,158	7,412	7,737	8,076
%growth	9.8%	-7.2%	-37.9%	26.0%	35.2%	4.3%	6.9%	4.6%	3.2%	5.0%	3.6%	4.4%	4.4%
% of total revenue	16.2%	14.7%	24.4%	24.9%	18.3%	16.7%	16.5%	16.5%	16.2%	16.2%	16.0%	16.0%	16.0%
Contract liabilities from unused flight documents	3,969	4,071	2,064	3,340	4,898	4,981	5,395	5,405	5,556	5,523	5,466	5,464	5,452
%growth	5.2%	2.6%	-49.3%	61.8%	46.6%	1.7%	8.3%	0.2%	2.8%	-0.6%	-1.0%	0.0%	-0.2%
% of total revenue	11.2%	11.2%	15.2%	19.9%	15.9%	14.1%	14.1%	13.5%	13.2%	12.5%	11.8%	11.3%	10.8%
Other contract liabilities	2,316	2,675	2,977	2,609	2,682	2,770	2,908	3,003	3,157	3,225	3,382	3,385	3,382
%growth		15.5%	11.3%	-12.4%	2.8%	3.3%	5.0%	3.3%	5.1%	2.2%	4.8%	0.1%	-0.1%
% of total revenue	6.5%	7.3%	21.9%	15.5%	8.7%	7.8%	7.6%	7.5%	7.5%	7.3%	7.3%	7.0%	6.7%
Advanced payments received	388	382	1,295	648	681	722	765	761	800	840	880	919	959
%growth	-60.9%	-1.5%	239.0%	-50.0%	5.1%	6.0%	6.0%	-0.6%	5.1%	5.0%	4.8%	4.4%	4.4%
% of total revenue	1.1%	1.0%	9.5%	3.9%	2.2%	2.0%	2.0%	1.9%	1.9%	1.9%	1.9%	1.9%	1.9%
Derivative financial instruments	393	137	366	247	489	263	268	300	337	353	371	387	404
%growth	216.9%	-65.1%	167.2%	-32.5%	98.0%	-46.2%	1.8%	12.1%	12.1%	5.0%	4.8%	4.4%	4.4%
% of total revenue	1.1%	0.4%	2.7%	1.5%	1.6%	0.7%	0.7%	0.8%	0.8%	0.8%	0.8%	0.8%	0.8%
Effective income tax obligations	783	402	689	705	545	675	727	761	800	840	880	919	959
%growth	-6.6%	-48.7%	71.4%	2.3%	-22.7%	23.9%	7.7%	4.6%	5.1%	5.0%	4.8%	4.4%	4.4%
% of total revenue	2.2%	1.1%	5.1%	4.2%	1.8%	1.9%	1.9%	1.9%	1.9%	1.9%	1.9%	1.9%	1.9%
Operating Working Capital	-5,561	-6,293	-6,843	-7,400	-9,329	-10,166	-10,442	-10,529	-10,654	-10,702	-10,717	-10,665	-10,521
Δ OWC		-732	-550	-557	-1,929	-837	-276	-87	-125	-48	-15	52	144

Appendix 12: Direct Beta Calculation Regression Output

SUMMARY OUTPUT

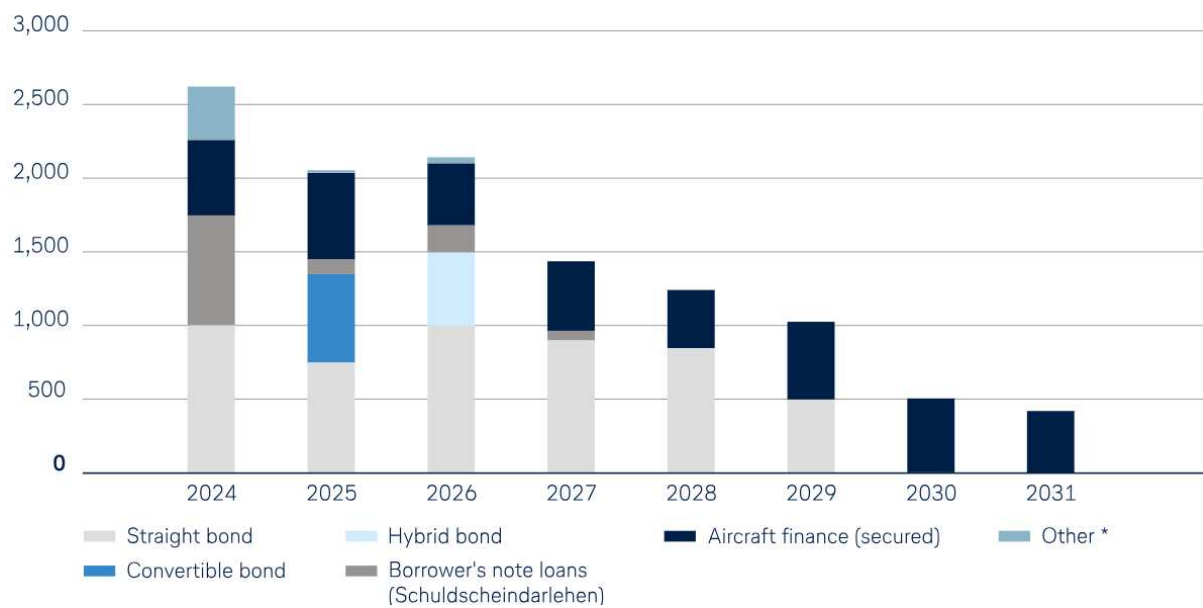
Regression Statistics	
Multiple R	0.55818452
R Square	0.31156995
Adjusted R	0.30890162
Standard E	0.05067893
Observatio	260

ANOVA

	df	SS	MS	F	Significance F
Regression	1	0.299895723	0.299896	116.7657	1.06963E-22
Residual	258	0.662635223	0.002568		
Total	259	0.962530945			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	-0.00270608	0.003149385	-0.85924	0.391006	-0.00890785	0.0034957	-0.00890785	0.003495697
X Variable	1.36274385	0.126112025	10.80582	1.07E-22	1.114403871	1.61108382	1.114403871	1.61108382

Appendix 13: Maturity Profile of Borrowings in million EUR



Appendix 14: Airlines Peer Group KPIs

Peer Group - Airlines							
	Market Cap (USD)	5y Revenue Growth	Operating Profit Margin	Net Profit Margin	Debt/Capital	Passenger Load Factor	# Planes
Deutsche Lufthansa AG	8,242	-0.10%	6.93%	5.47%	59.04%	82.90%	721
Air France-KLM SA	2,951	2.70%	5.59%	3.27%	98.92%	87.30%	551
easyJet plc	4,418	6.70%	5.54%	3.97%	56.90%	89.30%	336
International Consolidated Airlines Group S.A.	10,825	-4.00%	11.90%	9.01%	83.07%	85.30%	582
Ryanair Holdings plc	22,140	11.80%	15.33%	14.26%	26.51%	94.00%	584
American Airlines Group Inc.	9,080	-3.50%	5.39%	1.56%	120.50%	83.50%	1,521
Median	9,080	2.70%	5.59%	3.97%	83.07%	87.30%	582
Average	9,883	2.74%	8.75%	6.41%	77.18%	87.88%	715

Appendix 15: Logistics Peer Group KPIs

Peer Group - Logistics						
	Market Cap (USD)	5y Revenue Growth	Operating Profit Margin	Net Profit Margin	Debt/Capital	
Deutsche Lufthansa AG	8,242	-0.10%	6.93%	5.47%	59.04%	
Deutsche Post AG	52,172	-5.80%	7.76%	4.81%	49.13%	
FedEx Corporation	60,927	-6.60%	5.45%	4.41%	43.36%	
United Parcel Service, Inc.	118,632	-4.80%	10.05%	7.37%	54.17%	
S.F. Holding Co., Ltd.	25,674	23.20%	4.02%	3.06%	41.78%	
Median	56,549	-5.30%	6.61%	4.61%	46.25%	
Average	64,351	1.50%	6.82%	4.91%	47.11%	

Appendix 16: MRO Peer Group KPIs

Peer Group - MRO					
	Market Cap (USD)	5y Revenue Growth	Operating Profit Margin	Net Profit Margin	Debt/Capital
Deutsche Lufthansa AG	8,242	-0.10%	6.93%	5.47%	59.04%
Singapore Technologies Engineering Ltd	9,589	8.60%	8.48%	5.98%	68.94%
MTU Aero Engines AG	13,636	3.30%	-3%	-1.81%	35.28%
Bombardier Inc.	6,461	-13.10%	9.18%	6.09%	160.07%
Airbus SE	136,318	0.50%	7.03%	5.52%	48.72%
Median	11,613	1.90%	7.76%	5.75%	58.83%
Average	41,501	-0.18%	5.42%	3.95%	78.25%

Appendix 17: Valuation Summary

Share price (as of 13/05/2024)	6.81 €
Share Price (L3M Average)	6.98 €

Implied Share Price			
	Pessimistic Case	Base Case	Optimistic Case
Adjusted Present Value Analysis			
Total APV	8.96	9.23	9.51
Potential Upside/Downside (Price 13/05)	31.59%	35.61%	39.74%
Potential Upside/Downside (L3M Average)	28.34%	32.26%	36.29%
Discounted Cash Flow Analysis			
DCF Analysis (Perpetual Growth)	9.24	9.61	10.0
Potential Upside/Downside (Price 13/05)	35.66%	41.09%	46.68%
Potential Upside/Downside (L3M Average)	32.32%	37.61%	43.06%
DCF Analysis (Exit Multiple)	9.18	9.56	9.93
Potential Upside/Downside (Price 13/05)	34.77%	40.42%	45.91%
Potential Upside/Downside (L3M Average)	31.44%	36.96%	42.31%
Total DCF (Median)	9.21	9.58	9.96
Potential Upside/Downside (Price 13/05)	35.22%	40.76%	46.30%
Potential Upside/Downside (L3M Average)	31.88%	37.28%	42.69%
Comparable Company Analysis			
Total CCA (Weighted Multiple)	7.12	8.81	9.93
Potential Upside/Downside (Price 13/05)	4.55%	29.48%	45.81%
Potential Upside/Downside (L3M Average)	1.97%	26.28%	42.21%
Best Estimate Implied Share Price	9.08	9.41	9.74
Potential Upside/Downside (Price 13/05)	33.40%	38.18%	43.02%
Potential Upside/Downside (L3M Average)	30.11%	34.77%	39.49%

The sensitivity analysis resulted in three case scenarios for each valuation method: pessimistic, base, and optimistic. The pessimistic scenario is derived from the 25th percentile of the sensitivity table outcomes, while the optimistic scenario corresponds to the 75th percentile. For the weighted multiple approach, the base case represents the average of the calculated share prices, with the pessimistic and optimistic scenarios similarly representing the 25th and 75th percentiles, respectively.

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