



# Equity Valuation Mercedes-Benz Group AG

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## **Abstract**

**Title:** Equity Valuation | Mercedes-Benz Group AG

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The automotive industry has been suffering a lot of changes recently. Topics like shared mobility, autonomous driving and electric vehicles came to revolutionize this sector. In an economic environment that is still recovering from the Covid-19 pandemic, the vulnerabilities of this sector came forward. Challenges related to supply chain disruptions, increasing inflation rates and raw materials prices came to enhance the perseverance of the major firms. Mercedes-Benz AG, known as one of the most reputable luxury brands in the industry, has been investing to face these changes. Therefore, this dissertation aims to estimate the fair value of Mercedes-Benz Group AG share at the end of 2024. This thesis highlights each division of the company, after the spin-off of Daimler AG on 2021, using three main methodologies: Discounted Cash Flow (DCF), Relative Valuation and the Dividend Discount Model (DDM). To present the background of the assumptions taken, an overview of the company, as well as its strategy and ownership structure was made. Additionally, industry overview and key players are presented to showcase the competition faced by the firm. Furthermore, DCF model estimates a fair value of €81,31 for Mercedes-Benz share. Relative valuation returned an average value of €55,39 and the Dividend Discount model led to a share price of €44,92. Thus, this dissertation highlights a HOLD recommendation, based on the attribution of a 10% weight to the DDM, 20% to the Relative Valuation and a 70% weight to the DCF model, reaching a final Share price of €72,48.

**Keywords:** Mercedes-Benz Group AG, Automotive, Equity Valuation, DCF Valuation, Dividend Discount Model, Relative Valuation, Sensitivity Analysis, WACC, Share Price

## **Abstrato**

**Título:** Equity Valuation | Mercedes-Benz Group AG

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A indústria automóvel tem vindo a sofrer muitas alterações recentemente. Temas como mobilidade partilhada, condução autónoma e veículos elétricos vieram revolucionar este setor. Num ambiente económico que ainda está a recuperar da pandemia Covid-19, as vulnerabilidades deste setor foram evidenciadas. Desafios como ruturas nas cadeias de distribuição, taxas de inflação e preços das matérias-primas crescentes vieram realçar a perseverança das maiores empresas. A Mercedes-Benz AG, conhecida como uma das marcas de luxo mais conceituadas na indústria, tem vindo a investir para enfrentar estas mudanças. Assim sendo, esta dissertação visa estimar o valor justo da ação do grupo Mercedes-Benz AG, no final de 2024. Esta tese destaca cada divisão da empresa, depois da separação da Daimler AG em 2021, através de três metodologias principais: Discounted Cash Flows (DCF), Relative Valuation e o Dividend Discount Model (DDM). Para apresentar o contexto dos pressupostos tomados, foi feita uma abordagem global da empresa, bem como da sua estratégia e estrutura acionista. Adicionalmente, uma visão global da indústria e os seus principais intervenientes são apresentados para mostrar a competição enfrentada pela empresa. Além disso, o modelo DCF estima um valor justo de 81,31€. A Relative Valuation devolveu um valor médio de 55,39€ e o Dividend Discount Model levou a um preço por ação de 44,92€. Portanto, esta dissertação destaca uma recomendação HOLD, baseada na atribuição de 10% de peso ao DDM, 20% à Relative Valuation e 70% de peso ao modelo DCF, atingindo um preço final por ação de 72,48€.

**Palavras Chave:** Mercedes-Benz Group AG, Automotivo, Avaliação Patrimonial, Avaliação de Fluxos de Caixa Descontados, Modelo de Dividendos Descontados, Avaliação Relativa, Análise de Sensibilidade, WACC, Preço da ação

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## **1. Introduction**

As an essential concept in economics and finance, valuation determines the value of enterprises, assets and financial securities. It involves assessing an asset's intrinsic value by considering several variables, including risk, growth potential, cash flows and market conditions. Valuation offers insights that inform investment choices and strategic planning, whether it is used to value a firm for an acquisition or determine the fair value of a stock.

The process of valuation relies on a combination of quantitative analysis, financial modelling and qualitative judgment. Valuation is not only essential for investors seeking to make informed investment decisions but also for businesses evaluating strategic opportunities, such as mergers, acquisitions, divestitures and fundraising.

While valuation provides crucial insights, it is not an exact science and is subject to uncertainties and assumptions. Factors such as market volatility, changes in economic conditions and unforeseen events can impact valuation outcomes. Hence, it is essential to exercise diligence and judgement while interpreting valuation results and considering underlying factors driving the value of assets or businesses. Therefore, this dissertation starts with a Literature Review presenting the structure of the most accurate equity valuation models. Then, an overview of the company and industry where it operates will be conducted, highlighting its business divisions, the competition it faces and a geographical analysis of the market. Lastly, the suited models will be applied to evaluate Mercedes-Benz Group AG and a comparison with Morningstar Research Services LLC equity research will be made, as a way to analyse the assumptions made and the retrieving results.

## **2. Literature Review**

Literature helps in the application of different valuation techniques. These valuation techniques are linked to different models, that move with the same purpose but require different assumptions.

Generally speaking, “Value is the defining dimension of measurement in a market economy” (McKinsey, 2010), since people invest expecting that the value of the investment will grow sufficiently above its cost, to compensate them for the risk they faced during the investment period.

However, finding the correct value of an investment it’s not a straightforward task. (Damodaran, 2007) states that Valuation models can be separated into four main groups, specifically the cash-flow based models, liquidation and accounting valuation models, relative valuation models and contingent claim valuation models.

Following the previous statement, the remaining part of this dissertation, counts with an in-depth analysis to the cash-flow based models and relative valuation models.

### **2.1. Cash-flow Models**

“This approach has its foundation in the present value rule” (Damodaran, 2012), where the value of any asset in the future is discounted at its present value, based on a risk-adjusted rate.

The cash-flow models can be divided in two groups, the equity valuation models and the firm valuation models. The former ones assess exclusively the equity value, while the last ones value the entire business, including, not only the equity part, but also the other claimholders in the firm. Following the previous rationale and regarding firm valuation models, in this thesis only the free cash flows to firm (FCFF), where the future cash flows are discounted using the weighted average cost of capital, will be described. The equity models incorporated in this thesis are the dividend discount model (DDM) and the free cash flow to equity (FCFE). The first, values the stock relying on the present value of future dividends that the company

expects to distribute and the second refers to the cash flows that are discounted at the cost of equity.

### 2.1.1. Discounted Cash Flows Model

(Damodaran, 2012) says that “DCF forms the basis for all other valuation”. The reason behind the importance of DCF models is that they rely on cash flows, which can be considered as “the ultimate source of value” (Koller, et al, 2010).

According to (Rosenbaum & Pearl, 2021), the DCF model relies on the principle that the value of the target can be obtained from the present value of its future free cash flow. These future free cash flows should be discounted at a risk-adjusted rate.

Following this method allows us to value the entire firm or the equity value only, which should give back the same valuation, using the same set of assumptions. This value should be based on four main inputs: the future cash flows, the discount rate, the growth rate, and the terminal value (Damodaran, 2011).

Bellow, one can see the formula that joins together the previous variables:

$$V_0 = \frac{CF_1}{1+k} + \frac{CF_2}{(1+k)^2} + (...) + \frac{CF_t + TV_t}{(1+k)^t} , \quad TV_t = \frac{CF_{t+1}}{k-g}$$

Where:

$V_0$  = Firm’s value at  $t=0$ , its present value

$CF_{1,2}$  = Cash flow generated at  $t=1$  and  $t=2$

$CF_t$  = Expected cash-flow for period  $t$

$TV_t$  = Terminal value at period  $t$

$t$  = Period number

$k$  = Risk-adjusted discount rate (%)

$g$  = Perpetuity growth rate (%), that is, the expected growth of the FCFE after the company reaches the steady state.

With the previous formula it is possible to reach both the enterprise value (EV) and the equity value, so, it is important to mention that the previous variables will differ according to the type of valuation we are doing. For the Enterprise Value one should use the Free Cash-Flows to the Firm and the weighted average cost of capital (WACC) as a discount rate. For the Equity value one should use the Free Cash-Flows to Equity discounted at the cost of equity (Cegłowski & Błażej, 2012)

There are some rules that one should follow when using this method. The first is that, in perpetuity, the company will evolve at a lower or equal pace as the one of the economies in which it operates. The second rule is that the current performance of the company should be coherent with the stable growth implemented in the model, this is, assuming a constant cost of capital implies that the debt-to-equity ratio is kept constant for the period under analysis or that the capital expenditures offsets depreciations (Damodaran, 2007). Lastly, with regards to the forecast period, one should use between 5 to 10 years, according to (Hook, 2010).

#### **2.1.1.1. Firm Discounted Cash-Flows Model**

This DCF model approach seeks to find the entire firm value, also known as the Enterprise Value (EV). According to this method, the free cash-flows are discounted at the weighted average cost of capital rate (WACC), and then summed to a final Terminal Value, also discounted to its present value. The addition of the Terminal value (TV) happens because it is not possible to assume that the company will grow forever, since it would imply that one should estimate cashflows eternally.

$$Enterprise\ Value = \sum_{t=1}^{t=n} \frac{FCFF_t}{(1+WACC)^t} + \frac{TV}{(1+WACC)^t}$$

#### **2.1.1.1.1. Free Cash-Flows to the Firm (FCFF)**

The free cash-flows to the firm are the remaining amount of operational cash available to common and preferred shareholders and debtholders (Damodaran, 2012), after the deductions of taxes, depreciation and amortization expenses, changes in net working capital and capital expenditures.

The formula works as follows:

$$FCFF = EBIT (1 - T) + D\&A - Capex - \Delta WCN$$

Where:

EBIT = Earnings before interests and taxes

T = marginal tax rate

D&A = Depreciation and Amortization expenses

Capex = Capital expenditures

$\Delta WCN$  = Change in Working Capital Needs

#### **2.1.1.1.2. Weighted average cost of capital (WACC)**

“In an enterprise valuation, free cash-flows are available to all investors” (Koller et al., 2010). Bearing in mind the previous statement, one can conclude that, the correct discount rate attributable to these cash-flows, should include both weights of debt and equity, since the capital of a company include both items. This is why the use of WACC is so important. Broadly speaking, the WACC comprises a weighted average of the returns that the shareholders and bondholders require to invest a certain amount of capital into the company.

$$WACC = \frac{D}{D + E} * K_d * (1 - T) + \frac{E}{D + E} * K_e$$

Were:

D = Market value of Debt

E = Market value of Equity

$K_d$  = cost of debt

$K_e$  = cost of equity

T = marginal tax rate (%)

Additionally, (Luehrman,1997) says that the cost of debt and equity are both opportunity costs that include time value and its own risk premium. He also says that WACC can adjust for tax effects, deducting its absolute value. As it is observable above, this will reduce the value of WACC, and consequently will increase the Present Value (PV) of the expected free cash-flows, compared to any other risk-adjusted discount rate that does not consider the tax advantage.

### **2.1.1.1.3. Cost of Debt**

The cost of debt is an important financial metric that represents the risk that a company incurs when raising funds through borrowing. This cost primarily comprises the interest payments that a company must pay to creditors in exchange for the use of capital provided. In sum, it is the effective rate at which the company pays its current portion of debt. It is important to mention that this cost is computed in after-tax basis, since for the WACC it is used the after-tax cost of debt (Goedhart et al.,2010) and because interest payments are tax-deductible.

Also, when computing this cost, one should know which type of debt is being used, if the traded debt, non-traded debt, or both. In this Dissertation the cost of debt will be given by the weighted average between the cost of traded debt and the cost of non-traded debt. To

calculate this variable, one can use the YTM of company's current bonds outstanding, which is calculated by the present value of the bond's price and its future value, or one can sum a default spread and the risk-free rate, based on the company's debt rating. The second approach was the one used for the cost of non-traded debt.

$$\text{Cost of Debt } (k_D) = r_f + \text{Default Spread}$$

A third approach is applied when the firms lack a credit rating and there are no traded bonds. In this method a "synthetic" rating is calculated based on financial ratios. Among these ratios the interest coverage ratio emerges as the most effective (Damodaran, 2012).

$$\text{Interest Coverage Ratio} = \frac{\text{Earnings Before Interests and Taxes}}{\text{Interest Expense}}$$

#### **2.1.1.1.4. Cost of Equity**

The cost of equity represents the return a company is expected to generate for its stockholders and can be calculated using different models such as the Fama-French Three Factor Model or the Capital Asset Pricing Model (CAPM).

According to (Bruner et al., 1998) "CAPM is currently the preferred model for estimating the cost of equity" and the one that was used in this dissertation. CAPM in contrast, to alternative models, uniquely gauges risk by accessing a stock's sensitivity to the overall market, incorporating the risk-free rate, the beta, to capture the risk of the stock compared to other risky assets (Bruner et al., 1998) and the market risk premium, given by the difference between the return on the market portfolio and the risk-free rate.

$$E(R_i) = r_f + \beta_i[E(R_m) - r_f]$$

Where:

$R_f$  = risk-free rate

$B_i$  = beta

$E(R_m)$  = Expected return on the market

$E(R_m) - r_f$  = Market Risk Premium

For the risk-free rate, the usage of country-specific government bond yields was required, since a risk-free investment must lack default and reinvestment risk (Damodaran, 2012). According to (Pignataro, 2013) the maturity of these bond yields is also important, and one should decide if a 10-year or 30-year treasury rate should be applied.

Regarding Market risk premium (MRP), it is not consensual, between analysts, the best way to estimate it correctly yet. The general approach is to use historical figures (Damodaran, 2011). For the analysis in this dissertation the MRP used is given by the difference between the 10Y-annualized gross returns of the MSCI, as of 28<sup>th</sup> February 2024, and the risk-free rate.

In a detailed manner, beta is a measure of stock's volatility using the market as benchmark. Specifically, this variable quantifies the systematic risk of an asset, indicating how much the asset's returns are expected to move as a consequence of market changes. Usually, companies with higher betas will present returns that surpass the market risk premium. On the other hand, companies with low betas will present lower returns compared to the MRP (Goedhart et al., 2010). Also, the higher the beta, the higher the risk the company faces, even though depending on the industry a mature firm may present a higher beta than expected, which is the case of Mercedes-Benz. To calculate beta, one can use a regression between the excess returns of the company and the market excess returns. For dissertation purposes, it was used the 5 year monthly levered beta, retrieved from Refinitiv Eikon (Result of a regression between MB group and S&P500)

#### 2.1.1.1.5. Capital Structure

The capital structure of a company comprises a mix of different sources of funds used to finance its operations and investments. These sources commonly include debt and equity. The optimal capital structure of a firm depends on several factors, such as the industry where the company operates, growth prospects or the risk tolerance, this is it varies around firms.

For the WACC computation, the market value of equity and market value of debt are a mandatory requirement. The market value of equity was computed multiplying the shares outstanding by the current share price (McKinsey & Company, 2020), as of 2<sup>nd</sup> May, 2024.

With respect to the MV of debt, it was added the market value of traded debt to the market value of non-traded debt. The market value of traded debt represents all the current bonds outstanding that the company has and was calculated multiplying their current prices, divided by the face value (considered to be 100), by the bond's book value.

Now considering the MV of Non-Traded debt it was computed based on the presented formula and for which a weighted average maturity, the book value of the Non-Traded Debt, the cost of non-traded debt and the forecasted Interest Expense for the following year were needed. The maturity (T) was obtained by computing a weighted average maturity of the Financing Liabilities of the company but removing the value of bonds for each period, as a way to retrieve only the Non-Traded debt. Further details will be given in the following parts of this thesis.

$$\text{MV of Non-Traded Debt} = \text{Interest Expense} \times \frac{1 - \frac{1}{(1 + k_D)^T}}{k_D} + \frac{\text{BV of Non-Traded Debt}}{(1 + k_D)^T}$$

#### 2.1.1.1.6. Terminal Value

The Terminal value (TV) is an extremely important variable with regards to the DCF model since it will comprise a major part of the Enterprise value. It is a solution for the assumption that a company cannot grow endlessly, as previously mentioned, otherwise would not be clear when to stop predicting cash-flows.

According to (Rosenbaum & Pearl, 2021) there are two different ways to predict the TV, the perpetuity growth method, and the exit multiple method. The former, calculates the TV by assuming that the firm will eventually reach a steady state where the last year's FCF will grow at a constant rate (g) in perpetuity. The exit multiple calculates the TV based on a pre-determined multiple of an important financial metric, usually EBITDA or EBIT. For dissertation purposes, only the perpetuity growth was applied to find the terminal value.

$$\text{Terminal Value} = \frac{FCF(n+1)}{WACC - g}$$

Where:

FCF = Last year's free cash flow (FCFF or FCFE)

g = perpetuity growth rate

Wacc = weighted average cost of capital, considered the discount rate

As mentioned before, it is extremely important that perpetuity growth rate is chosen carefully, otherwise the terminal value may end up being over or undervalued.

#### **2.1.1.2. Equity Discounted Cash-Flows Model**

As mentioned before in this dissertation, the DCF can be done to find the enterprise value, using the FCFF, or the equity value, using the FCFE. This method doesn't change, still being necessary to discount the cash-flows to their present value, however there are some small adjustments that need to be made with regards to the components used.

First one should define the FCFE. According to (Damodaran, 2011) "The key difference is that the FCFE is after debt cash-flows and FCFF is before". So based on the previous statement it is plausible to say that the FCFE is given by the cash available to the common equity holders after Depreciation and Amortization expenses, Capital Expenditures, Working capital Needs and Debt Cash-Flows have been met.

$$FCFE = Net\ Income + D\&A - Capex - \Delta WCN + \Delta NetDebt$$

As done for the whole firm value (EV), to find the equity value one should apply the same method but this time using the cost of equity as a discount rate, for both the Free Cash-flows and the Terminal Value.

$$Value\ of\ Equity = \sum_{t=1}^{t=n} \frac{FCFE_t}{(1 + K_e)^t} + \frac{TV}{(1 + K_e)^t}$$

The use of the Cost of equity as a discount rate instead of the weighted average cost of capital is linked with the specific risk associated to equity investments. Using the cost of equity to discount the FCFE, allows the capture of the volatility and uncertainty inherent in equity ownership. Also, since WACC incorporates both costs of debt and equity, probably it could bring some complexities related to capital structure, such as the tax shields from interest payments.

### **2.1.2. Dividend Discount model**

The dividend discount model is another discounted cash-flows model that seeks to find the equity value of a firm. “Since dividends historically have depended on the size and sustainability of earnings, both dividends and earnings are key determinants of the value of equity” (Foerster & Sapp, 2005). According to (Pinto, 2010) the DDM has been considered the oldest and simplest model to value a stock. When using the dividend discount model, one should discount the future expected dividends to obtain the current value of the stock.

With regards to the projection of future dividends, there are two main models that battle this topic, and that show different perspectives with respect to future growth. These models are the Gordon Growth model and the Two-stage Growth model. However, the DDM also shows some constraints in terms of forecasted values, since companies may retain some cash that can pay to shareholders, or on the other hand, pay too much dividends surpassing the value of cash-

flows financing the gap by the issuance of debt or equity, distorting the valuation (Damodaran, 2007)

### 2.1.2.1. Gordon Growth Model

This model is made for companies experiencing a stable growth for the rest of activity period, so only firms that show a steady state and that are able to sustain it, can be considered a prospect target to apply this model.

The variables included in this model are the cost of equity, dividends, and the perpetual growth rate.

$$Price\ per\ Share_t = \frac{E(Dividend\ per\ Share_{t+1})}{K_e - Perpetual\ Growth\ Rate}$$

### 2.1.2.2. Two-Stage Growth Model

This model appears as a solution for companies that do not experience the steady state. It comprises two different stages of growth, in a first stage the company experience a higher growth rate, usually higher than the market where it operates, and then in a second phase, the company is expected to mature and to stabilize at a more sustainable growth rate.

$$Price\ per\ Share = \sum_{t=1}^{t=n} \frac{E(Dividend\ per\ Share_t)}{(1 + K_e)^t} + \frac{Terminal\ Value}{(1 + K_e)^t}$$

## 2.2. Relative Valuation

The foundation of relative valuations techniques relies on the idea of efficient market structure and an average stock price that reflects all the available information, thus it is feasible to determine an asset's value by comparing it to its pre-determined peers (Liu et al., 2002).

According to (Plenborg & Pimentel, 2016), this model, which depends on the company's multiples, should be applied in addition or alternative to more complex models.

### **2.2.1. Peer group selection**

The companies that will be used as a benchmark represent an important decision for relative valuation, since the final share price will depend on the characteristics presented by these firms respectively. (Albuquerque, 2009) says that for the peer group to be bullet-proof, one should include companies that present similar values with regards to the following variables: operating leverage, industry, size, diversification, financing constraints and growth options. Also, (Goedhart et al., 2005) adds that to choose the right companies is important to match them with expectations for growth and return on invested capital.

Even though it is suggested to regress a chosen multiple against firm's characteristics to find the comparable firms (Bhojraj & Lee, 2002), (Damodaran, 2007) reflects that using these statistical techniques may lead to odd results, as some of these variables included in the regression, may be correlated with each other, misleading the explanatory power of the model. So, a regression method was not applied in this dissertation.

To cope with risk (Koller et al., 2010) defends that first to find the correct peers one should investigate companies operating in the same industry, facing the same risks and presenting close values for cost of capital.

Given the previous analysis, the variables chosen to find the peer group for Mercedes Benz Group Ag were the Market capitalization, representing size, 5-year monthly beta that represents the volatility of the stock price against the market, the Debt-to-Equity ratio as a leverage component, the operating and EBITDA margin and the Return on invested capital.

### **2.2.2. Multiples**

To define the correct multiples to use in relative valuation first it should be defined whether to use historical or forward-looking ones. According to (Goedhart et al., 2005) it is recommended that multiples follow a forecast approach rather than an historical base.

(Fernandez, 2001) adds that the most common multiples used are the Price to Earnings ratio and the Enterprise Value to EBITDA.

(Damodaran, 2012) also states that revenue multiples may show some attractiveness to investors. This concept arises because of three main reasons: this multiple will never be negative, working as a neutral element to exclude companies from the initial sample. Another reason is that, considering cyclical companies, the revenue multiples show a better performance, given that they are less harmed by economy movements than earnings multiples. The last reason is linked to the dependence on accounting rules, as these multiples are not manipulated easily.

Bearing in mind the previous references, the chosen multiples were the EV/EBITDA, EV/Revenues and P/E ratio.

### **3. Company Overview**

Mercedes-Benz is a German luxury commercial automotive company created in 1926. The company founders, Gottlieb Daimler and Carl Benz, created history when they invented the first automobile in 1886. Mercedes considers it both a duty and a source of inspiration to help shaping the future transformation in a sustainable and safe manner as leader in the automotive engineering. Therefore, the company's focus continues to be on cutting-edge and environmentally friendly technologies in addition to superb and safe cars that both captivate and inspire.

Mercedes-Benz is constructing a path for a full-electric future by constantly investing in the development of efficient powertrains. If market conditions allow, the segment of Mercedes-Benz cars is expected to entirely transit to electric vehicles by the end of this decade. By 2023, Mercedes-Benz Vans hopes to have a greater than 50% EV's share.

The automotive company has production sites in Europe, North and South America, Asia, and Africa, and it sells its cars and services in almost every nation on earth. The company is traded under the ticker symbol MBG on the stock exchanges in Stuttgart and Frankfurt, the group sold over 2.5 million automobiles and employed about 166000 people in 2023.

Following the stock market debut of Daimler Truck, in February 2022, the spin-off between Mercedes-Benz and Daimler Group became effective, leading to two separate entities. Mercedes-Benz, that until then, was a subsidiary of Daimler, became the major group, while Daimler decided to follow the commercial vehicles business (Trucks and Buses). The rebranding of Daimler group, now called Mercedes-Benz group, gave rise to three divisions: Mercedes-Benz Cars, Mercedes-Benz vans and Mercedes Benz Mobility (former Daimler mobility ag). According to Ola Källenius, the current chairman of the board management of Mercedes-Benz Group AG, the spin-off allowed both companies to follow and implement individual strategies. Operating independently their business operations can be even more strongly diversified based on their markets, customers, risks technologies and other factors. Additionally, the necessary processes can be even more quickly and precisely adjusted to the ever-changing market conditions and competitive landscape. Moreover, the separation gives Daimler Truck AG the access to new sources of funding since it is already quoted on the market.

As mentioned before Mercedes-Benz Group is currently composed by two business units, Mercedes Benz AG which is responsible for the major business of Mercedes-Benz Cars and Vans and Mercedes-Benz Mobility AG which operates in the field of financial and mobility services of Mercedes-Benz Group. The last, offers Mercedes customers: financing, leasing, and insurance services, at the same time focusing on electrification, sustainability, digitalisation, and artificial intelligence solutions.

### **3.1. Strategy**

The world is evolving quickly. Among the most pressing issues, Mercedes outstands the urgency of sustainability and preserving the ecosystem and climate. Mercedes hopes to provide guidelines for future sustainable mobility through the actions it takes. The company firmly believes that personal mobility will always be essential, and that the sustainable luxury segment demand will keep expanding. Another essential component of the economy will continue to be the movement of people and products. Mercedes anticipates that this demand will keep rising globally, while it considers the domains of fleet management, digital, networked mobility, and financial services as an opportunity for growth and profit.

The company's goal is to "Build the most desirable cars" (Appendix 1) by thinking and acting like a luxury brand, focusing on profitable growth, expanding its customer base, embracing customers and grow lifetime revenues. It also seeks the lead in electric drive and digital experience, decreasing its cost base, improving industrial footprint, and increasing supply chain resilience.

The group is fully committed to focus on growth, by investing in the Top-End and core segments, which hopefully will give back high and stable returns. This growth is expected to align luxury and sustainability as a response to demanding clients that want to be pioneers in this matter. Regarding this ambitious plan, Mercedes deeply focusses on a decarbonization strategy, that does not lie in doing without but rather with technological progress.

In the electric segment, the firm is attempting to increase the energy density of batteries by creating solid-state ones, limiting the use of raw materials, like cobalt. The company also has plans with regards to the manufacture of its own green electricity and integrating green steel into automobiles.

### **3.2. Ownership structure**

Globally, there are more than one billion outstanding Mercedes-Benz shares. Currently, the largest individual shareholder of Mercedes-Benz Group AG is the Chinese BAIC Group, with 9,98% of the company's voting rights (Appendix 2). Kuwait Investment Authority (since 1974) and the Chinese investor Li Shufu (since 2018) are two more significant shareholders. Almost 11% of the shares is owned by Li Shufu, via Tenaciou3 Prospect Investment Limited and 5,57% belongs to Kuwait Investment Authority. Institutional investors and retail investors own 43,66% and 31,1% of the Group's shares respectively.

### Mercedes-Benz Group Ownership Structure

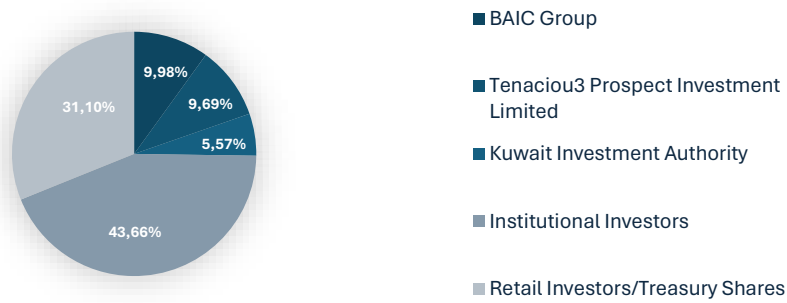


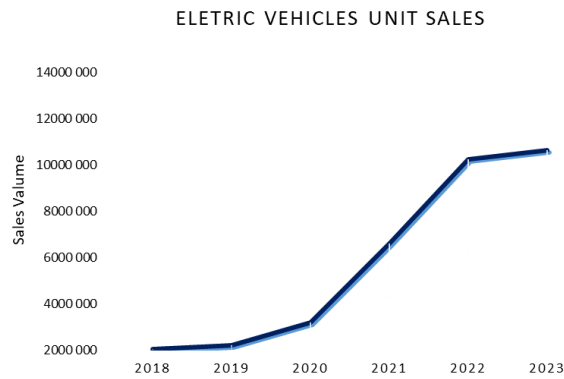
Figure 1-Mercedes-Benz Group AG Ownership Structure  
Source: Mercedes-Benz Website

## 4. Industry Overview

The automotive industry accounts for nearly 3% of world’s GDP, being larger in emerging markets, like China and India where this share may reach 7% of the GDP. This sector is experiencing a new approach which is being driven by digitalization, top-notch technology, and sustainability concerns.

In recent years the automotive industry has been facing some constraints, shaped by high inflation rates and raw materials price increases, which affected not only the manufacturer’s production costs and profit but also the consumer’s purchasing power. Additionally, the semiconductor shortage in 2022 also affected the recovery from the covid pandemic. However, the market has been recovering and is forecasted to return to its pre-pandemic values already this year.

Now, two main concerns emerge in this industry. The first is the switch to electric vehicles from fossil fuels. To avoid the irreversible effects of climate change, these companies are committed more than ever to reach carbon neutrality, thus contributing to the evolution of new technology solutions that seek to reach this goal. Considering that transportation accounts for more than a third of all carbon-dioxide emissions worldwide, moving to electric vehicles has been recognized as a critical emissions strategy. According to Our World in Data organization, in 2022, 1 out of 7 sold cars was electric and in 2023 this number grew to 1 out of 5 sold cars. However, some countries move faster than others which is the case of Norway (over 4 in 5) and China (over 1 in 3).



*Figure 2-Electric Vehicles unit Sales*  
 Source: Statista, Own analysis

Connected cars represent the second significant trend presently affecting the automotive industry. The expansion of internet connectivity in automobiles has led to a shift in consumer expectations. To stay ahead of the curve, the automotive industry is producing new cars with cutting-edge linked features that improve the experience for both drivers and passengers.

In a near future diversified mobility and autonomous driving have also become a central topic. The industry will see several changes as a result of these advancements. According to projections, by 2030, one in ten cars sold will be used as a shared vehicle, signalling a trend toward shared mobility. Unit sales will increase, despite this trend, but more slowly than in prior years. Additionally, by the end of the decade completely autonomous vehicles are expected to make up to 15% of all newly sold vehicles. However, first, the industry needs to get across the obstacles posed by regulations and technology.

Automakers will undoubtedly be impacted by the advent of electric vehicles as well since they will need to modify their production methods to meet the demand for these automobiles. The need to address climate change certainly will speed up the shift to electric vehicles, but manufacturers may do it gradually.

#### **4.1. Geographical analysis**

The year of 2008 saw China surpass the USA to take the top spot in automotive manufacturing terms, a position it has held ever since. The Organisation Internationale des

Constructeurs d'Automobiles shows that in 2023 38,41% of all passenger automobiles produced worldwide came from China (Appendix3). It is predicted that it continues to be the major player in the automotive production even though it currently faces constraints regarding market space for original equipment manufacturers (OEMs) and local Chinese brands. Additionally, and according to local statistics, there are already some brands that have been forced to exit the Chinese market because of the intense competition, such as Renault Acura, Mitsubishi and Airways. Other significant automakers were Japan, India, Germany and South Korea. These countries collectively accounted for more than 30% of the passenger cars worldwide output in 2023.

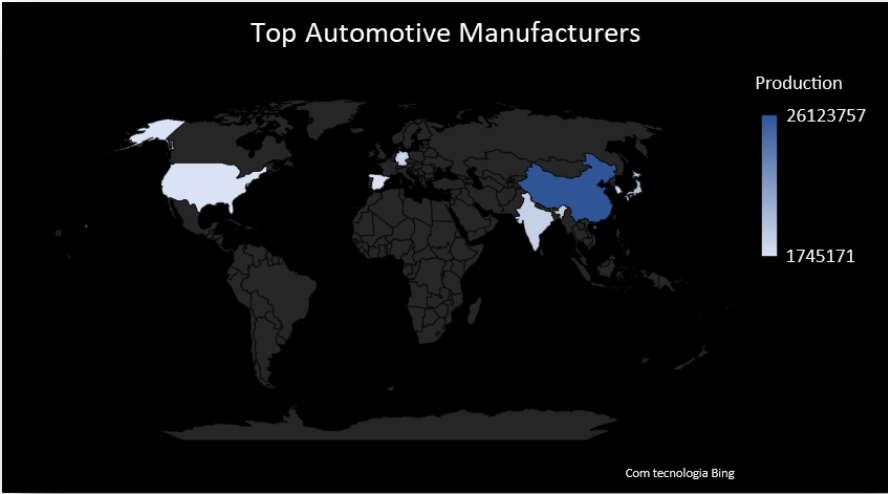


Figure 3-Automotive Manufacturers Ranking by Region  
Source: OICA, Own analysis

#### 4.2. Key players

In 2023, the top 5 players of the automotive industry were Volkswagen, Toyota, Stellantis, Ford and General Motors, which accounted for \$1,19 trillion in combined Revenues. Mercedes-Benz comes right after the top 5, accounting for more than \$169 billion in Revenues last year. Volkswagen shows the highest Revenue, however Toyota Motor continues to be the major producer in the industry. The first registered \$355 billion in Revenue selling cars under the brand's name but also as Seat, Skoda, Audi, Bentley, Lamborghini, Porsche, Ducati, MAN and Cupra. In third place, Stellantis operates under the brands Abarth, Alfa Romeo, Chrysler, Citroën, Dodge, DS Automobiles, Fiat, Jeep®, Lancia, Maserati, Opel, Peugeot, Ram Trucks and Vauxhall. This group comprises a significant number of brands and is the output of a merge

between FCA (Fiat Chrysler Automobiles) and the French PSA Group (former Peugeot, Citroën, DS, Opel and Vauxhall). The fourth is Ford, the second largest automaker brand in USA (right after General Motors Co), operates under the names of Ford and Lincoln. In fifth place General Motors, as mentioned above the largest group in USA. This group sells under the brands Chevrolet, Buick, GMC and Cadillac. The last of the top 6 is Mercedes-Benz group, which before the spin off included Smart and Freightliner brands but after the group only operates under the brands Mercedes-Benz, Mercedes-AMG and Mercedes-Maybach.

It is important to say that many of the groups and companies mentioned before include connectivity, shared mobility or financial brands that also contribute to the overall Revenue. However, in this analysis only the core business of this companies is highlighted since it is the where the competition is most centred.

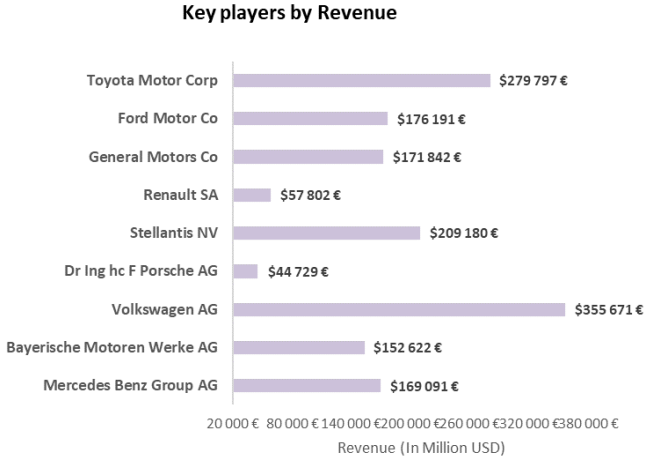


Figure 4-Key players in the Automotive Market by Revenue  
 Source: Refinitiv Eikon, Own analysis

**5. Discounted Cash-Flows Valuation**

To apply the Discounted Cash-Flows model a forecast period of 5 years was applied. As suggested by (Hook, 2010), this period should be between 5 to 10 years, however after 2028 the market will probably be full of electric vehicles and with much less fossil fuel automobiles, which are a considerable part of the projections done in this dissertation.

Regarding historical figures only the last 3 years were considered. This assumption was made based on the spin-off of Mercedes from Daimler group. As previously mentioned, the

spin off became effective when Daimler truck started to be traded on the market, however in 2021 the group was already reporting separate figures which allows for an individual analysis of the years 2021 and 2022. Additionally, Mercedes-Benz group already released the 2023 final results which were also updated in this dissertation as non-forecasted values.

One important note is that, since in 2021 the company was still reporting Mercedes-Benz Cars & Vans as an individual unit, it was not possible to obtain the specific values for the single revenues of each segment. Bearing in mind that these two parts do not operate as a single one anymore, the year of 2020 could not be used for this dissertation.

### **5.1. Revenues Forecast**

In terms of expected Revenues, these were calculated as a sum of the current parts of Mercedes-Benz Group, as the different parts that make up the company (Mercedes-Benz Cars, Mercedes-Benz Vans and Mercedes-Benz Mobility) show different growth rates.

In terms of the automotive segment (cars and vans) the forecast of the total revenues was done based on the evolution of the average price per unit and the prospected units sold. Mercedes-Benz Cars and Mercedes-Benz Vans are currently the two automotive segments of the company. These two segments serve different purposes, while Vans are most used in a commercial sense, the Cars segment serves the purpose of day-to-day mobility, so two types of data were used to forecast the evolution of the two segments. According to Statista forecast of worldwide Passenger cars unit sales, an initial selection of the segments that were coherent with Mercedes-Benz cars was done (Appendix 4), ending with a sum of forecasted unit sales of Executive Cars, Large Cars, Luxury Cars, Medium Cars, Small Cars, Sports Cars and SUVs, for the expected period. It is important to refer that the initial group also included Vans and Pickup Trucks, but these segments didn't match the Mercedes Cars business activity. After the sum of the matching segments, based on their forecasted evolution, an average growth rate for the period of 2024 to 2028 was obtained, returning a value of 2,14% (Appendix 5). This growth rate showed to be different from the current scenario of the Mercedes segment, as the company registered a 0,16% units growth in 2023. Hence, the final growth rate applied to this segment, was a result of a 70% weight applied to the 2023 year's growth rate and a 30% weight applied to the market expectation, which returned a value of 0,76%. This rate was kept constant for the

expected period (2025-2031) of the unit sales of Mercedes-Benz Cars. Additionally, the values for 2024 follow a different source. The 2024 first quarter results, returned an expectation of -5% in units sold and an average price per unit of €55 538,38, which were applied to the expected period.

Mercedes-Benz Cars												
	2021	2022	2023	2024E	2025E	2026E	2027E	2028E	2029E	2030E	2031E	CAGR
Revenues	96 712 000 000 €	111 601 000 000 €	112 756 000 000 €	107 846 922 934 €	111 595 590 031 €	115 249 680 176 €	118 907 299 574 €	122 561 193 282 €	126 203 880 059 €	129 827 675 114 €	133 424 714 612 €	3,1%
% change		15,40%	1,03%	-4,35%	3,48%	3,27%	3,17%	3,07%	2,97%	2,87%	2,77%	
Average Price per unit	49 751,53 €	54 687,10 €	55 163,01 €	55 538,28 €	57 037,81 €	58 463,76 €	59 866,89 €	61 243,83 €	62 591,19 €	63 905,61 €	65 183,72 €	
% change		9,92%	0,87%	0,68%	2,70%	2,50%	2,40%	2,30%	2,20%	2,10%	2,00%	
Units	1 943 900	2 040 719	2 044 051	1 941 848	1 956 519	1 971 301	1 986 195	2 001 201	2 016 320	2 031 554	2 046 902	0,8%
% change		4,98%	0,16%	-5,00%	0,76%	0,76%	0,76%	0,76%	0,76%	0,76%	0,76%	
Global unit sales	49 070 000	49 570 000	55 160 000	57 180 000	57 970 000	58 750 000	59 660 000	61 300 000	62 985 082	64 716 486	66 495 484	2,2%
Market Share	4,0%	4,1%	3,7%	3,4%	3,4%	3,4%	3,4%	3,4%	3,4%	3,4%	3,4%	

Table 1-Mercedes-Benz Cars Revenue Forecast  
Source: Annual Reports, Own analysis

The evolution of the Mercedes-Benz Vans unit sales was estimated differently. The sum of the Vans segment, not used for Mercedes-Benz cars unit sales, and the Light Commercial Vehicles (which is included in the Commercial Vehicles forecast from Statista) unit sales was done. The segments included were the Light Commercial Vehicles, Full-size Vans, and Minivans. This selection gave as output an average growth rate of 0,31% for the same forecasted period. Bearing the previous analysis in mind, it doesn't make sense to apply it for the growth of Mercedes-Benz Vans unit sales, since in 2022 and 2023 this variable showed growth rates of 7,55% and 7,81%, thus a different approach was needed. Based on historical figures, the year of 2021 seems to be atypical showing a growth rate of 3,07%, while the years of 2022 and 2023 show a huge jump for a higher than 7% rate. The current year's growth rate (7%, based on first quarter results of 2024) was used as the start of a moving factor for the forecast of Mercedes-Benz Vans unit sales, with a weight of 70%. The remaining 30% were based on the market expectation (0,31%) for the segment, which was kept as a fixed variable. More specifically and as example, the year 2025-unit sales are a result of a 70% weight corresponding to the previous year growth rate, plus a 30% weight based on the Market forecast. This growth rate may seem too low comparing with the previous years, but one condition should be highlighted. The fact that commercial vehicles do a considerable distance per day, requires a certain autonomy, and since Mercedes is investing a lot in electric vans, which will decrease the fossil fuel vehicles disposals, the options for long distance vans become expensive and scarce. At this moment, combustion vans still do a better job in terms of autonomy, and with the electric transition there are not too many options remaining besides buying a more expensive electric van or a combustion one that shows a better autonomy performance. Additionally, Mercedes CEO Ola

Källenius, said recently that the company will decelerate the investment in Ev’s, for costs and adherence reasons. Thus, it is realistic that the company will sell less units in both segments.

With regards to the average price per unit, this variable was computed based on IMF inflation rate for Europe (from 2025 to 2031). This variable is calculated using the percentage change on the respective countries’ CPI (Consumer Price Index). It was used for the two industrial segments of Mercedes, assuming inflation rate would affect each segment in the same way. Hence, it was applied for each forecasted period the corresponding forecasted inflation rate predicted by the IMF, becoming this way, the inflation rate the driver of the price variable. Specifically, starting in 2025 with a price change of 2,7% and finishing with 2% in 2031, according to the expectation of a downward trend for the inflation rate in Europe.

Mercedes-Benz Vans												
	2021	2022	2023	2024E	2025E	2026E	2027E	2028E	2029E	2030E	2031E	CAGR
Revenues	14 735 000 000 €	17 217 000 000 €	20 288 000 000 €	22 237 694 623 €	23 978 279 183 €	25 436 647 045 €	26 684 309 438 €	27 765 497 205 €	28 503 586 296 €	29 232 664 575 €	29 951 027 812 €	4,3%
% change		16,84%	17,84%	9,61%	7,83%	6,08%	4,90%	4,05%	2,66%	2,56%	2,46%	
Average Price per unit	38 153,81 €	41 452,39 €	45 306,95 €	46 412,14 €	47 665,27 €	48 856,90 €	50 029,47 €	51 180,14 €	52 306,11 €	53 404,53 €	54 472,62 €	
% change		8,65%	9,30%	2,44%	2,70%	2,50%	2,40%	2,30%	2,20%	2,10%	2,00%	
Units	386 200	415 344	447 790	479 135	503 056	520 636	533 372	542 505	544 938	547 382	549 836	2,0%
Units % change		7,55%	7,81%	7,00%	4,99%	3,49%	2,45%	1,71%	1,20%	0,84%	0,59%	
Global unit sales	26 810 000	26 050 000	26 470 000	26 580 000	26 660 000	26 730 000	26 760 000	26 880 000	27 000 538	27 121 617	27 243 238	0,4%
Market Share	1,4%	1,6%	1,7%	1,8%	1,9%	1,9%	2,0%	2,0%	2,0%	2,0%	2,0%	

Table 2-Mercedes-Benz Vans Revenue Forecast  
Source: Annual Reports, Own analysis

Still regarding the analysis of these two segments it is important to mention that the market share, based on Mercedes-Benz unit sales over Global unit sales, is almost constant, since this dissertation is the opinion that Mercedes units will not grow faster than the market. The previous assumptions returned a CAGR of 3,2% and 5,2% for Mercedes-Benz Cars and Mercedes-Benz Vans respectively.

Mercedes-Benz Mobility												
	2021	2022	2023	2024E	2025E	2026E	2027E	2028E	2029E	2030E	2031E	CAGR
Revenues	27 941 000 000 €	26 954 000 000 €	26 718 000 000 €	26 584 410 000 €	26 610 994 410 €	26 744 049 382 €	26 877 769 629 €	27 012 158 477 €	27 147 219 269 €	27 282 955 366 €	27 419 370 143 €	0,4%
% change		-3,53%	-0,88%	-0,50%	0,10%	0,50%	0,50%	0,50%	0,50%	0,50%	0,50%	

Table 3-Mercedes-Benz Mobility Revenue Forecast  
Source: Annual Reports, Own analysis

Moving to the Financial services segment of Mercedes, the Revenues of Mercedes Benz-Mobility were expected to present an YoY growth of 0,50% starting in a recovery point of - 0,50% in 2024 and keeping a steady growth of 0,5% from 2026 to 2031. The increasing

Revenues are a result of the investment in digitalization and online selling technologies that have been a central topic for this department as mentioned in the annual reports. The company has been decreasing revenues in this segment, and its peers (considered BMW and VW financial services) have been experiencing a completely different path in their financial services, showcasing growth rates between 6% and 10% (Appendix 16), in recent years (2021 and 2022). To conclude, even though the company shows negative growth rates for the Revenue generated by Mercedes-Benz Mobility, in this dissertation, Mercedes is described as a mature but a still growing firm, and it will not lag behind its competitors. It is also considered that this negative trend is a consequence of Covid pandemic and Ukraine War.

The reconciliation variable (Appendix 6) presents the elimination of intra-group revenues, and it also accounts for the final Revenue of the group. Reconciliation was estimated as a % of total revenues, and the last year’s rate of 4,10% was applied and kept constant for the forecasted period.

In conclusion, for the forecasted period (2024-2031) is expected a CAGR of 2,86%, based on the following results.

Mercedes-Benz Group												
	2021	2022	2023	2024E	2025E	2026E	2027E	2028E	2029E	2030E	2031E	CAGR
Total Revenues	133 893 000 000 €	150 017 000 000 €	153 218 000 000 €	150 251 718 582 €	155 541 620 878 €	160 572 272 770 €	165 404 872 602 €	170 074 884 894 €	174 405 748 689 €	178 710 500 506 €	182 979 967 434 €	2,86%
% change		12,04%	2,13%	-1,94%	3,52%	3,23%	3,01%	2,82%	2,55%	2,47%	2,39%	

Table 4-Mercedes-Benz Group Total Revenue Forecast  
Source: Annual Reports, Own analysis

### 5.2. Cost of Sales

In 2023, the cost of sales of Mercedes-Benz primarily comprised expenses of goods sold, depreciation of equipment on operating leases and refinancing costs at Mercedes-Benz Mobility. In recent years, this variable has been showing a close to constant 78% rate in relation to Revenues.

For the forecast of Cost of sales, a direct relation with Revenues was done, applying an 80% relation to revenues to the expected period, since the company is expecting higher costs for 2024.

	2021	2022	2023	2024E	2025E	2026E	2027E	2028E	2029E	2030E	2031E
Cost of sales (-)	-103 218 000 000	-115 997 000 000	-118 839 000 000	-120 201 374 866	-124 433 296 702	-128 457 818 216	-132 323 898 082	-136 059 907 916	-139 524 988 952	-142 968 400 405	-146 383 973 947
% of Revenues	77,1%	77,3%	78%	80%	80%	80%	80%	80%	80%	80%	80%
SG&A (-)	-12 002 000 000	-12 066 000 000	-12 416 000 000	-12 576 293 784	-13 019 066 526	-13 440 139 620	-13 844 635 461	-14 235 522 481	-14 598 022 265	-14 958 336 436	-15 315 697 210
% of Revenues	8,8%	8,0%	9,1%	9,4%	9,0%	9,4%	9,2%	9,4%	9,4%	9,4%	9,4%
Research and non-capitalized development costs (-)	-5 467 000 000	-5 602 000 000	-5 230 000 000	-5 699 123 368	-6 155 053 237	-6 893 659 626	-7 858 771 973	-8 644 649 171	-9 336 221 104	-9 803 032 160	-9 999 092 803
% of Revenues	4,1%	3,7%	4,1%	3,8%	4,0%	4,3%	4,8%	5,1%	5,4%	5,5%	5,5%
Other Operating Income (+)	2 888 000 000	3 323 000 000	2 206 000 000	2 103 524 060	2 177 582 692	2 248 011 819	2 315 668 216	2 381 048 389	2 441 680 482	2 501 947 007	2 561 719 544
% of Revenues	2,2%	2,2%	1,4%	1,4%	1,6%	1,4%	1,4%	1,4%	1,4%	1,4%	1,4%
Other Operating Expense (-)	-1 735 000 000	-1 289 000 000	-516 000 000	-1 248 001 713	-1 291 940 026	-1 333 724 987	-1 373 864 913	-1 412 654 375	-1 448 626 845	-1 484 382 427	-1 519 844 930
% of Revenues	1,3%	0,9%	0,3%	0,9%	0,9%	0,9%	0,9%	0,9%	0,9%	0,9%	0,9%
Profit/Loss on equity method investments (+/-)	1 352 000 000	1 732 000 000	2 129 000 000	1 803 020 623	1 866 499 451	1 926 867 273	1 984 858 471	2 040 898 619	2 092 868 984	2 144 526 006	2 195 759 609
% of Revenues	1,0%	1,2%	1,4%	1,2%	1,2%	1,2%	1,2%	1,2%	1,2%	1,2%	1,2%
Other Financial income/expense.net (+/-)	317 000 000	340 000 000	108 000 000	150 251 719	155 541 621	160 572 273	165 404 873	170 074 885	174 405 749	178 710 501	182 979 967
% of Revenues	0,2%	0,2%	0,1%	0,1%	0,1%	0,1%	0,1%	0,1%	0,1%	0,1%	0,1%

Table 5-Operating costs forecast

Source: Annual reports, Own analysis

Even though one can argue that the expansion of electric vehicles in the market will increase the automotive production costs- McKinsey has estimated that this cost is approximately €12000 above the production of a fossil fuel engine- one should also consider the evolution of Revenues, that probably will offset some of the increase in the referred production expenses.

### 5.3. Selling General & Administrative Expenses

The selling expenses primarily consist of direct selling costs, selling overhead expenses, material costs and personnel expenses. General and Administrative expenses are the ones that cannot be attributed to production, sales or R&D functions. This variable also includes personnel expenses, administrative costs and D&A of fixed and intangible assets.

To forecast this variable, the average of last 3 years' percentage of total Revenue (8,4%) was applied to the following periods.

#### **5.4. Research and non-capitalized Development Costs**

This account represents the R&D expenditure that does not meet the conditions for capitalization, according to accounting rules (IAS 38). This variable was estimated as % of total Research and Development, keeping constant a 63% rate of the entire expenditure.

Bearing in mind this relation with R&D, a forecast was done for this major account. In 2021, Daimler closed a deal to invest more than €60 billion, from 2022 to 2026, for the software-driven transformation and emissions-free future. Additionally, the company mentioned that €40B would be invested in R&D with only purpose of developing the battery electric vehicles. Given the previous information, it was forecasted that Mercedes-Benz reaches a total of €61B between 2022 and 2027, with the highest growth rate reaching 14% in the initial years and gradually decreasing to a 2% growth rate achieved between 2030 and 2031. In 2023 the company achieved a 17% growth rate in R&D. With the deceleration of the investment in electric vehicles, this variable is expected to follow a gradual downward trend, starting with a decrease of 9% in 2024 (according to 2024 first quarter results) and gradually moving to 14% in 2027.

#### **5.5. Other Income statement assumptions**

In this analysis the remaining accounts mentioned are Other operating income and expenses, Profit/Loss on equity method investments and other financial income/expense. All these remaining categories were estimated as a % of Revenues. The last, shows a 2023 rate of 0,1%, which was the level at which this account was kept constant for the expected period. According to Mercedes-Benz 2023 annual report, the decrease in Other Operating Income was due to the sale of retail activities in Canada, thus this account was expected to show a constant rate for the following periods (1,4%).

The decrease registered in Other Operating Expense, in 2023, was a consequence of the ongoing official and legal procedures and due to measures related to diesel vehicles. Since the measures related to combustion engines are expected to prevail, it was attributed a continuity of this trend to the following years, registering a growth rate of 0,8%, coming from the average

% of the last 3 years. Profit and Loss on Equity Method Investments was kept constant for the forecasted period, at the 2023 rate of 1,2%.

## 5.6. Free Cash Flow to Firm

As mentioned before, to reach the Free Cash Flow to the Firm, one should account for Taxes, D&A, Capital Expenditures and the Change in Net Working Capital, thus a thorough analysis should be done to these items.

	2021	2022	2023	2024E	2025E	2026E	2027E	2028E	2029E	2030E	2031E
EBIT	16 028 000 000	20 458 000 000	19 660 000 000	14 583 721 253	14 841 888 150	14 782 381 685	14 469 633 733	14 314 172 844	14 207 234 738	14 321 532 592	14 701 817 665
Taxes on EBIT (-)	4 761 000 000	5 495 000 000	5 553 000 000	4 122 786 084	4 195 769 300	4 178 946 953	4 090 533 791	4 046 585 338	4 016 354 170	4 048 665 923	4 156 171 681
% of EBIT	29,7%	26,9%	28,2%	28,3%	28,3%	28,3%	28,3%	28,3%	28,3%	28,3%	28,3%
D&A(+)	15 066 000 000	13 891 000 000	13 697 000 000	13 431 827 784	13 904 721 254	14 354 438 905	14 786 451 592	15 203 929 684	15 591 089 427	15 975 914 876	16 357 586 014
Capex(-)	27 946 000 000	18 369 000 000	21 471 000 000	19 532 723 416	20 220 410 714	20 874 395 460	19 848 584 712	18 708 237 338	17 440 574 869	17 871 050 051	17 383 096 906
Change in Net Working Capital (-)		357 000 000	1 596 000 000	1 361 553 973	-387 186 353	-368 210 914	-353 714 795	-341 814 447	-316 990 989	-315 079 762	-312 497 139
FCFF	-1 613 000 000	10 128 000 000	4 737 000 000	2 998 485 565	4 717 615 743	4 451 689 091	5 670 681 616	7 105 094 299	8 658 386 115	8 692 811 256	9 832 632 230

Table 6-FCFF calculations

Source: Annual Reports, Own analysis

### 5.6.1. Income Taxes

Regarding the taxes imposed to Mercedes-Benz group, there is one important note to do. The current effective tax rate of the firm is, 27,1%. As it is possible to see in the above table, the tax generated for the historical years and forecasted years differs from the one mentioned in the company's annual report, this is because for the effective tax rate to be calculated Mercedes uses the Profit before income taxes as reference instead of EBIT. In this dissertation the historical tax rates were calculated based on Earnings Before Interest and Taxes, yielding an average of 28,3%, which was maintained constant for the coming years of this analysis.

### 5.6.2. Depreciation & Amortization

Depreciation and Amortization expenses were calculated as a % of Revenues, since the last is a core and stable account. This relation was kept constant at the values registered in 2023 (8,9%). Although one could estimate this variable according to Intangible Assets and Property Plant and Equipment (Koller, 2010), the annual reports showed a considerable difference between the total D&A and the depreciation and amortization attributed to PP&E (Property

Plant and Equipment) and Intangible Assets. Forecasting this variable by following its relation with the previous mentioned accounts would lead to an underestimation and consequently would the final Free Cash Flows.

	2021	2022	2023	2024E	2025E	2026E	2027E	2028E	2029E	2030E	2031E
<b>Capex</b>	27 946 000 000	18 369 000 000	21 471 000 000	19 532 723 416	20 220 410 714	20 874 395 460	19 848 584 712	18 708 237 338	17 440 574 869	17 871 050 051	17 383 096 906
% Revenues	20,87%	12,24%	14,01%	13%	13%	13%	12%	11%	10%	10%	10%
<b>Depreciation and amortization</b>	15 066 000 000	13 891 000 000	13 697 000 000	13 431 827 784	13 904 721 254	14 354 438 905	14 786 451 592	15 203 929 684	15 591 089 427	15 975 914 876	16 357 586 014
% Revenues	11,3%	9,3%	8,9%	8,9%	8,9%	8,9%	8,9%	8,9%	8,9%	8,9%	8,9%

Table 7-D&A and Capex computation  
 Source: Annual Reports, Own analysis

### 5.6.3. Capital Expenditures

Capex is considered the money that a firm uses for buying, maintaining and improve its fixed capital. In Mercedes-Benz activity, this variable is divided between PP&E, Intangible Assets, Equipment on Operating Leases and Right-of-use Assets. Assuming no future acquisitions by Mercedes-Benz, Capex was computed as a % of Revenues, starting with a 13% rate and finishing the forecast period with a 10% relation with the main account. The motive behind this method is the inconsistency between the growth rates presented for the previous years, not being possible to accurately predict the main accounts that contribute to Capex. One should also refer that the amounts presented below are not the total amounts of the accounts or the increment from one year to another, but rather the amounts accounted by Mercedes-Benz for the calculation of Capital Expenditures, which was the followed method to calculate this variable. Below are presented the historical figures of the accounts that contributed to the Capex calculations.

Lastly, according to the literature, the assumption that D&A will offset Capex, performing one of the characteristics of a stable company, was considered to happen only after the expected period, since the company is doing a deceleration in the capex expansion, but it is still facing a considerable investment need, given that electric vehicles will take over the automotive market.

	2021	2022	2023
<b>Intangible assets</b>	2 904 000 000	3 480 000 000	4 513 000 000
<i>% change</i>		19,83%	29,68%
<b>Right-of-use Assets</b>	747 000 000	923 000 000	469 000 000
<i>% change</i>		23,56%	-49,19%
<b>Propety, Plant and Equipment</b>	4 030 000 000	3 421 000 000	3 718 000 000
<i>% change</i>		-15,11%	8,68%
<b>Equipment on operating leases</b>	20 265 000 000	10 545 000 000	12 771 000 000
<i>% change</i>		-47,96%	21,11%
<b>Capex</b>	27 946 000 000	18 369 000 000	21 471 000 000
<i>% Revenues</i>	20,87%	12,24%	14,01%

*Table 8- Capex computation and Historical Values*

*Source: Annual Reports, Own analysis*

#### **5.6.4. Net Working Capital**

To determine the working capital values for the period of forecast, an in-depth analysis was done to choose which operating items would contribute to this major account (Appendix7).

Moving to the different operating variables, Trade Receivables was calculated based on Days Sales Outstanding ratio (DSO), as a % of Revenues. To reach the value that would be applied to the expected period, one considered the last 3 years' results of this ratio (Appendix8). Even though that in 2021 Covid pandemic still had an impact, its result regarding DSO was similar to the ones registered in in the following historical years, that's why it was used. To find Trade Payables the ratio Days Payable Outstanding (DPO) was applied, as a percentage of COGS, keeping the last year ratio constant for the forecasted period.

With respect to the forecast of Inventories, was used the Days Inventories Outstanding (DIO), also as a percentage of COGS, of the last year, and then keeping it constant for the next periods.

Within Other Financial Liabilities, not all the items could be considered as part of the operational sector of Mercedes, for this reason one added the operating accounts to the Net Working Capital and the rest was treated as debt. To predict the future values of the operating items included in this account, a constant percentage of revenues was applied, using the historical average rate. Contract and Refund Liabilities were forecasted based on the last 3 historical years, returning an average % of Revenues of 6,78%. The Provisions for Other Risks account was kept constant at last year's % of Revenues (9,99%)

Regarding the remaining accounts forecasted, this is Other Assets, Deferred Tax Assets, Deferred Tax Liabilities, Deferred Income and Other Liabilities, the average % of Revenues of the historical period was applied and kept constant for the expected Period.

	2024E	2025E	2026E	2027E	2028E	2029E	2030E	2031E
Inventories	28 283 285 995	29 279 053 770	30 226 020 418	31 135 705 874	32 014 785 957	32 830 024 947	33 640 348 635	34 444 030 319
<i>DIO as a % of COGS</i>	85,88	85,88	85,88	85,88	85,88	85,88	85,88	85,88
Deferred Tax Assets	4 047 101 793	4 189 587 838	4 325 090 849	4 455 259 233	4 581 048 245	4 697 702 129	4 813 652 675	4 928 652 806
<i>% of Revenues</i>	2,69%	2,69%	2,69%	2,69%	2,69%	2,69%	2,69%	2,69%
Trade Receivables	7 140 040 746	7 391 419 687	7 630 478 913	7 860 126 600	8 082 048 042	8 287 852 969	8 492 417 041	8 695 304 356
<i>DSO as a % of Revenues</i>	17,34	17,34	17,34	17,34	17,34	17,34	17,34	17,34
Other assets	5 938 756 593	6 147 842 003	6 346 680 442	6 537 690 797	6 722 274 817	6 893 453 864	7 063 600 824	7 232 353 136
<i>% of Revenues</i>	3,95%	3,95%	3,95%	3,95%	3,95%	3,95%	3,95%	3,95%
Trade Payables(-)	12 975 060 685	13 431 872 787	13 866 297 193	14 283 618 716	14 686 899 913	15 060 893 775	15 432 632 725	15 801 324 631
<i>DPO as a % of COGS</i>	39,40	39,40	39,40	39,40	39,40	39,40	39,40	39,40
Deferred tax liabilities(-)	7 564 657 920	7 830 986 330	8 084 262 372	8 327 567 174	8 562 686 251	8 780 730 367	8 997 459 834	9 212 412 829
<i>% of Revenues</i>	5,03%	5,03%	5,03%	5,03%	5,03%	5,03%	5,03%	5,03%
Deferred income(-)	2 648 708 976	2 741 961 897	2 830 644 629	2 915 836 004	2 998 161 209	3 074 507 742	3 150 393 961	3 225 658 161
<i>% of Revenues</i>	1,76%	1,76%	1,76%	1,76%	1,76%	1,76%	1,76%	1,76%
Contract and refund liabilities (-)	10 189 831 533	10 548 584 256	10 889 755 031	11 217 494 232	11 534 207 005	11 827 919 269	12 119 860 661	12 409 409 088
<i>% of Revenues</i>	6,78%	6,78%	6,78%	6,78%	6,78%	6,78%	6,78%	6,78%
Provisions for other risks(-)	15 003 793 903	15 532 031 481	16 034 380 904	16 516 953 301	16 983 290 076	17 415 760 256	17 845 622 954	18 271 962 183
<i>% of Revenues</i>	9,99%	9,99%	9,99%	9,99%	9,99%	9,99%	9,99%	9,99%
Other financial liabilities(-)	3 903 928 335	4 041 373 681	4 172 083 031	4 297 646 476	4 418 985 477	4 531 512 522	4 643 361 110	4 754 292 905
<i>% of Revenues</i>	2,60%	2,60%	2,60%	2,60%	2,60%	2,60%	2,60%	2,60%
Other Liabilities(-)	4 120 649 803	4 265 725 247	4 403 690 756	4 536 224 691	4 664 299 667	4 783 073 503	4 901 131 219	5 018 221 248
<i>% of Revenues</i>	2,74%	2,74%	2,74%	2,74%	2,74%	2,74%	2,74%	2,74%
<b>Working Capital</b>	<b>- 10 997 446 027 -</b>	<b>- 11 384 632 381 -</b>	<b>- 11 752 843 295 -</b>	<b>- 12 106 558 090 -</b>	<b>- 12 448 372 537 -</b>	<b>- 12 765 363 526 -</b>	<b>- 13 080 443 288 -</b>	<b>- 13 392 940 427</b>
<b>Change in Working Capital</b>	<b>1 361 553 973 -</b>	<b>387 186 353 -</b>	<b>368 210 914 -</b>	<b>353 714 795 -</b>	<b>341 814 447 -</b>	<b>316 990 989 -</b>	<b>315 079 762 -</b>	<b>312 497 139</b>

Table 9- Net working capital computation and Historical Values

Source: Own analysis

## 5.7. Weighted Average Cost of Capital

Following what was mentioned in the Literature Review, The WACC was computed using the Following components: Cost of Debt, Cost of Equity, Market Value of Debt, Market Value of Equity and the tax rate. The same WACC was applied to discount the future period's FCFF.

### 5.7.1. Cost of Debt

For the computation of the final Cost of Debt, as mentioned before, it was applied the respective weights to each cost of Debt, the traded and the non-traded.

To calculate the Cost of Traded Debt a weighted average yield of Mercedes current Bonds Outstanding was done, based on the Market Value of each bond outstanding. These computations led to a value of 2,76% (Appendix 9). It is important to refer that some of the bonds were expressed in a different currency and for these cases a conversion method was done, calculating the spread between the ytm of the different currency bonds against the Eurobonds

and then adding the risk-free (with the same maturity) of the Eurobonds to the spread (Appendix 17).

For the cost of Non-traded Debt, the ratings of S&P and Moody's were the considered ones, yielding an A and A2 rating. Following the Damodaran default spread table, based on the company ratings, a 1,07% spread was added to the risk-free (2,53%), returning a value of 3,60% as the result for the cost of non-traded debt.

After the attribution of the respective weights, one reached a final value of 3,16% for the Cost of Debt to be implemented in the WACC model (2,31% After-tax Cost of Debt).

<b>Cost of traded debt</b>	2,76%
<b>Cost of Non-traded Debt</b>	3,60%
<b>MV of Traded Debt</b>	54 349 433 163
<b>MV of Non-traded Debt</b>	49 823 944 831
<b>Traded Debt weight</b>	52,2%
<b>Non-Traded Debt weight</b>	47,8%
<b>Final Kd</b>	3,16%

*Table 10-Final cost of debt  
Source: Refinitiv Eikon' Debt Structure of Mercedes-Benz Group AG, Own analysis*

### 5.7.2. Cost of Equity

To compute the cost of equity several components are needed, since the model used was CAPM.

Starting with the risk-free rate, since Mercedes is a German company, the German 10-year bund, retrieved from Bloomberg, was used. The 10-year bunds showed a 2,53% yield.

For the beta parameter, it was assumed the 5Y monthly beta, retrieved from Refinitiv Eikon, which measures the company's stock price volatility relative to market price volatility for a 5-year duration, which yielded a value of 1,36.

The last component is the equity risk premium, which still creates some debate in the current days. For the computation of this variable one accessed the gross returns of the MSCI world index and retrieved the 10Y annualized gross returns (Appendix 10), to reach the

expected return of the market (9,64%). Then, subtracting the risk-free rate, it was possible to obtain the equity risk premium, yielding a value of 7,11%.

The computation of the Cost of equity worked as follows:

$$\text{Cost of Equity} = r_f + \beta_i * [E(R_m) - r_f]$$

Considering the previous formula, a cost of equity 12,20% was achieved. Additionally, one should refer that all the values retrieved from online platforms, for the computation of Cost of equity, are updated as of 28/03/2024.

CAPM Model	
Risk-free	2,53%
Equity Risk Premium	7,11%
Beta (5Y montly Levered)	1,36
Cost of Equity	12,20%

Table 11-CAPM model  
Source: Refinitiv Eikon, Own analysis

**5.7.3. Mercedes-Benz Group Capital Structure- Market Weights**

To calculate the Market Value of Equity, one should look to the current figures of the company, with regards to the shares outstanding and the current share price of Mercedes Benz group. As of 28/03/2024 the firm had 1 040 937 447 shares outstanding and the current share price was €73,81, giving back a Market Value of Equity of €76,833 Billions.

For the Market Value of Debt a rigorous approach was applied, splitting it into two main categories, the Market Value of Traded Debt, which comprises the bonds publicly traded, and the Market Value of Non-Traded Debt, that in the case of Mercedes includes, Commercial Paper, Liabilities to Financial Institutions, Deposits in the direct banking business, Liabilities from ABS transactions, Lease Liabilities and Loans. For the computation of the former one, the last price of each bond was retrieved, which divided by the face value and then multiplied by the amount issued for each bond, gave back the individual market value of each bond. After adding the market values of all bonds, a total value of €54 349 433 163 was achieved for the Market Value of Traded Debt. It is important to refer that the bonds with different currencies

suffered adjustments, as referred in the chapter of the cost of debt, affecting significantly the computation of Cost of Traded Debt.

A company’s non-traded debt comprises a considerable part of its financial commitments, thus it requires a particular approach.

One of the most important steps is to convert the Book Value of Non-Traded Debt into Market Value. It was done by treating the non-traded debt as an individual coupon bond, setting it equal to the forecasted interest expense for 2024 and with its maturity equal to the weighted average maturity of the Financing Liabilities (which include their undiscounted principal and interest expense). The Financing Liabilities do not include the value of the company’s bonds, otherwise one would be double counting them since that amount is already included in the computation of the traded debt. It is important to refer that the value of the financing liabilities was only used to calculate its average maturity, since the amount used was the sum of the outstanding values for each class of Non-Traded Debt (€51 411 000 000)

<b>Weighted average maturity</b>	0,99
<b>Total Amount</b>	51 411 000 000
<b>Interest expense (2024E)</b>	188 416 338
<b>Cost of non-traded debt</b>	3,60%
<b>MV of Non traded debt</b>	49 823 944 831

*Table 12- Market Value of Non-traded Debt  
Source: Annual Reports, Own analysis*

Bearing in mind that the interest expense yielded a value of €188 416 338, as a forecasted value for 2024, and the weighted average maturity was 0,99 years, the market value of non-traded debt obtained was €49 823 944 831. The Damodaran formula applied is the following one.

$$\text{MV of Non-Traded Debt} = \text{Interest Expense} \times \frac{1 - \frac{1}{(1 + k_D)^T}}{k_D} + \frac{\text{BV of Non-Traded Debt}}{(1 + k_D)^T}$$

In essence, with the previous components, a value of 6,40% was found for the WACC variable.

WACC Computation	
Pre-Tax Cost of Debt	3,16%
Cost of Equity	12,20%
Effectivel tax rate	27,10%
Market value of Debt	104 173 377 993
Market Value of Equity	73 452 186 539
WACC	6,40%
D/V	58,65%
E/V	41,35%

Table 13-Wacc computation  
Source: Own analysis

**5.8. Terminal Value**

To determine the Terminal Value, there are two main conditions that one should pay attention to: the terminal growth rate and the discount factor.

To apply the perpetuity growth rate, it is assumed that the company found a stable rate at which will grow for the rest of its activity period. This perspective assumes that the company reached a steady state and thus a minacious choice for this rate should be done. For this component the expected IMF inflation rate for 2031 was used.

In sum, the 2% inflation rate assumed to be the perpetuity growth rate, that will be applied to the Terminal Value.

The discount factor is the second important topic that should be mentioned. When calculating the Terminal Value, since the company is considered to achieve the steady state after the end of the forecasted period, the discount factor should be the same as the last year of the expected period and not counting as an extra period. Broadly speaking, the Free cash flows evolve but the capital structure remains the same.

$$\text{Terminal Value}_n = \frac{E[CF_{n+1}]}{r - g} = \frac{E[CF_n] \times (1 + g)}{r - g}$$

After applying the above-mentioned formula, a terminal value of €228 093 346 625 was achieved.

Year	2024E	2025E	2026E	2027E	2028E	2029E	2030E	2031E	Tv
FCFF	2 998 485 565	4 717 615 743	4 451 689 091	5 670 681 616	7 105 094 299	8 658 386 115	8 692 811 256	9 832 632 230	228 093 346 625
Discount Factor	0,94	0,88	0,83	0,78	0,73	0,69	0,65	0,61	0,61
Discounted FCFF	2 818 204 755	4 167 385 974	3 696 039 192	4 425 043 940	5 211 020 124	5 968 434 524	5 631 891 971	5 987 347 185	138 892 010 271
	WACC								6,40%
	Growth Factor								2,00%

Table 14-Discounted FCFF and Terminal Value  
Source: Own analysis

## 5.9. Share price

To finally reach the share price, one should calculate the enterprise value (EV) first, which resumes the sum of all discounted FCFF and the TV. A value of €176 797 377 934 was obtained. Then the Net Debt should be subtracted, as the difference between the Financing Liabilities and Cash and Cash Equivalents.

Pension liabilities	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Personnel and social costs	2625000000	2191000000	2092000000	2077151880	2154111247	2231874262	2310409583	2384101194	2451882635	2515946535	2575481459
% of operating expenses	2,2%	1,6%	1,5%	1,50%	1,50%	1,50%	1,50%	1,50%	1,50%	1,50%	1,50%
Provisions for pensions and similar obligations	5359000000	1021000000	1090000000	1080118978	1120137848	1160574616	1201412983	1239732621	1274978970	1308292198	1339250359
% of personnel expenses	204%	47%	52%	0,52	0,52	0,52	0,52	0,52	0,52	0,52	0,52
Total	7984000000	3212000000	3182000000	3157270858	3274249095	3392448878	3511822566	3623833814	3726861605	3824238733	3914731818

Table 15-Unfunded Pension Liabilities Forecast  
Source: Annual Reports, Own analysis

One should mention that the Debt of Mercedes-Benz include both the Traded and Non-Traded Debt Market values. After also subtracting the Pensions Underfunded (sum between personnel and social costs and provisions for pensions and estimated as presented above) one should find the market value of Minority Interests. This variable was forecasted based on Refinitiv Eikon's forward looking P/B value, that multiplied by the amount registered as of 31<sup>st</sup> December 2023, returned a market value of €161 460 000 (Appendix 11). Lastly Other Financial Liabilities were also backed out, representing the non-included financial liabilities in the Net Working Capital calculations (€2 293 000 000) (Appendix 7). Thus, an equity value of €84 221 269 082 was achieved. Dividing the previous component by Mercedes shares outstanding (retrieved from Refinitiv Eikon platform), the €81,31 share price is finally estimated, showing an upside potential of 15%, for the year of 2024.

(1) Enterprise Value	176 797 377 934
(2) Debt	104 173 377 993
(3) Cash and Equivalents	17 209 000 000
(4) Net Debt (2)-(3)	86 964 377 993
(5) Pensions Unfunded	3 157 270 858
(6) Minority Interest	161 460 000
(7) Other Financial Liabilities	2 293 000 000
(8) Equity Value (1)-(4)-(5)-(6)-(7)	84 221 269 082
(9) Shares	1 035 850 889
(10) Share Price (7)/(8)	81,31
Upside	15%
Current share price	70,91

*Table 16-Mercedes-Benz Group AG  
estimated Share Price  
Source: Own analysis*

### 5.9.1. Sensitive Analysis

Understanding how the model's inputs affect the outcome is crucial, especially considering how subjective equity valuations may be. Hence, we may see the possible range of outputs by changing the input values based on different hypothesis.

To see how WACC and the Perpetual Growth Rate affect the Share price, a variation of these components was inserted in this analysis. The chosen margin was 0,4% for each end, with increments of 0,1%, for both variables.

It is important to refer that a sensitivity analysis, with the same inputs, was also performed for the Enterprise value and Terminal value. This way it's possible to understand the change in the values driving the share price.

If one wants to take a closer look, it is possible to see the various possibilities showcased by this analysis. In a direct way the best-case scenario unfolds an Enterprise Value of €214 288 422 817 and a corresponding Terminal Value of €175 662 617 545. These components lead to a share price of €117,50 (Appendix 12).

On the other hand, the worst-case scenario displays a higher difference to the share price achieved. The Terminal Value reaches €113 589 273 329 and the Enterprise Value is given by €150 792 819 124.

Terminal Value	WACC
138 892 010 271	6,40%

g
2,00%

Share Price	Enterprise Value
81,31	176 797 377 934

Share Price	WACC									
81,31	6,00%	6,10%	6,20%	6,30%	6,40%	6,50%	6,60%	6,70%	6,80%	
Terminal Growth Rate	1,60%	85,56	81,31	77,25	73,37	69,64	66,07	62,65	59,36	56,20
	1,70%	88,90	84,49	80,27	76,23	72,37	68,68	65,13	61,73	58,46
	1,80%	92,40	87,81	83,42	79,23	75,22	71,39	67,71	64,19	60,82
	1,90%	96,08	91,28	86,72	82,36	78,20	74,22	70,41	66,76	63,26
	2,00%	99,93	94,93	90,17	85,63	81,31	77,17	73,22	69,44	65,81
	2,10%	103,99	98,76	93,80	89,07	84,56	80,26	76,16	72,23	68,47
	2,20%	108,25	102,79	97,60	92,67	87,97	83,50	79,22	75,15	71,25
	2,30%	112,75	107,03	101,60	96,45	91,55	86,88	82,44	78,20	74,14
	2,40%	117,50	111,50	105,81	100,42	95,30	90,44	85,80	81,39	77,17

Figure 5- Sensitivity Analysis on share price  
Source: Own analysis

## 6. Dividend discount model

Since Mercedes expects to keep its dividend based on a distribution ratio of 40% of the net profit attributable to shareholders, the DDM should also be considered for valuation purposes. In this dissertation the two-stage Dividend Discount model was the chosen one. The company announced a share buyback program that would start right after the conclusion of the ongoing one, on February 16<sup>th</sup>, 2023. This program allows the company to buy back shares, with the approval of the Supervisory Board, up to a maximum value of 10% of the share Capital until July 2025.

Given the previous information it is not rational to use the current shares outstanding as the ones for the explicit period. Hence, assuming the share capital per No-Par-Value Shares as a constant variable (€2,87), one could reach a value of 995 853 702 shares for the following periods, if the company acquires the 10% of the share capital until the indicated date. This dissertation is the opinion that Mercedes will not acquire such %, since on 22<sup>nd</sup> March 2024 in a Virtual Meeting the company presented an amount of 33 000 000 acquired treasury shares (Appendix13). For the end of 2024 it was forecasted a value of 45 000 000 treasury shares acquired. For the remaining expected period a value of 60 000 000 treasury shares was used, returning an acquisition of 5,60% of the share capital and constant outstanding shares of 1 009 837 447. As an informative note, the number of no-par-value shares was kept at 1 069 837 447, which after the subtraction of the treasury shares will return the shares outstanding of Mercedes-Benz Group AG.

Share Capital	3 070 000 000 €
%	10%
Treasury shares acquired until today 2024	33 986 558
Share capital/No-Par-Value Shares	2.87 €
% of share capital to be acquired until 2025	307 000 000
Nº of Shares it represents	106 983 745
Nº Shares to be acquired	72 997 187
Forecasted Shares outstanding	996 840 260

Figure 6-Forecasted Shares outstanding based on share capital and treasury shares  
Source: Annual Reports, Own analysis

For the calculation of this model, the Net Income was forecasted, using the same assumptions as in the DCF model (Using EBIT and deducting interest expenses and Income taxes and adding interest income) (Appendix 14). The profit attributable to non-controlling interests assumed the last year's rate. Then, the profit attributable to shareholders worked as the difference between the Net profit and the profit attributable to non-controlling interests.

For the earning per share, the Net profit was divided by the shares outstanding that the company presents and as referred, the last will be kept constant relying on the share buyback program.

To reach the dividend per share, the profit attributable to shareholders was divided by the shares outstanding, keeping constant a 40% ratio for the year of 2024 and then gradually increasing until it reaches 50% in 2027. The motive of the increasing trend is given by the possible unsatisfaction of shareholders upon the drop in the dividend values.

Years	2021	2022	2023	2024E	2025E	2026E	2027E	2028E	2029E	2030E	2031E
Dividend attributable to shareholders	5 349 000 000	5 563 000 000	5 517 000 000	4 230 095 418	4 627 851 637	4 930 875 771	5 246 254 564	5 189 889 115	5 151 116 570	5 192 557 539	5 330 437 483
Shares outstanding	1 069 837 447	1 069 837 447	1 035 850 889	1 024 837 447	1 009 837 447	1 009 837 447	1 009 837 447	1 009 837 447	1 009 837 447	1 009 837 447	1 009 837 447
<b>Dividend per share (DPS)</b>	5,0	5,2	5,3	4,1	4,6	4,9	5,2	5,1	5,1	5,1	5,3
% of Profit attributable to shareholders	23%	38%	39%	40%	43%	46%	50%	50%	50%	50%	50%

Table 17-Dividend per share forecast  
Source: Annual Reports, Own analysis

Next, one should discount the explicit period dividends, to their present value. This computation was assisted by the cost of equity, used as discount rate and the perpetuity growth rate. The last was the same as the one applied in the DCF model.

With all the future dividends of Mercedes-Benz discounted, inclusive its Terminal value, the second stage of this model, a final share price of €44,92 was obtained, after adding the first and second stages of the model.

Year	2024E	2025E	2026E	2027E	2028E	2029E	2030E	2031E
DPS	4,1	4,6	4,9	5,2	5,1	5,1	5,1	5,3
Cost of Equity	1,12	1,26	1,41	1,58	1,78	2,00	2,24	2,51
Present Value	3,68	3,64	3,46	3,28	2,89	2,56	2,30	2,10
TV								52,79
Discounted TV								21,02
Share price								44,92

Table 18-Share price returned by DDM  
Source: Annual Reports, Own analysis

## 7. Relative Valuation

### 7.1. Peer Group

Choosing an appropriate peer group is an important step in this process since it should include companies that are as similar to Mercedes-Benz as possible. Selecting firms operating in the same industry should be the first step, according to the principles outlined in the literature. Next, one should think about operating leverage, profitability, business segments, diversification and firm size. Companies that operate in the automotive segment but do not work internationally were not deemed as appropriate peers.

Using Refinitiv Eikon platform it was possible to do a first selection of the corresponding peers, within the same industry and operating as globally as Mercedes. The variables chosen to do this selection process were the Market Capitalization, the D/E ratio, 5-year Monthly Beta, Operating and EBITDA margin and the Return on Invested Capital (ROIC).

Company	Market Cap	D/E Ratio	5-year monthly Beta	Operating Margin	EBITDA Margin	Return on Invested Capital
Mercedes Benz Group AG	61 943 588 181,30	130,93%	1.38	12,30%	16,20%	8,70%
Bayerische Motoren Werke AG	58 870 781 723,65	102,31%	1.25	15,20%	17,3%	12%
Volkswagen AG	55 656 906 568,20	123,13%	1,41	7,20%	16,15%	4,36%
Porsche Automobil Holding SE	13 707 750 000,00	13,57%	1.39	89,70%	98,74%	9,60%
General Motors Co	37 138 489 723,98	169,19%	1.49	6,20%	14,62%	5,80%
Volvo Car AB	10 352 020 948,78	30,90%	1.42	6,80%	10,10%	10,30%
Ford Motor Co	38 220 316 243,65	321,38%	1.68	3,90%	10,98%	-1,30%
Continental AG	12 376 370 228,04	57,90%	0.57	1,90%	12,70%	0,50%
Renault SA	10 271 913 534,74	219,2%	1.88	4,10%	16,50%	3,60%
Stellantis NV	58 480 434 195,19	37,71%	1.43	11,10%	17,07%	14,70%
Ferrari NV	78 931 237 054,80	108,40%	0.57	24,10%	37,83%	16,80%

Figure 7-Peer selection  
Source: Refinitiv Eikon's data, Own analysis

All the information was retrieved form the same source, Refinitiv Eikon.

The size of the firms selected, measured by Market cap, was not an exclusion factor since all the companies are mature ones. However, it is important to mention that this component is a decisive factor since firms with different sizes perform differently because they explore different opportunities.

The operating leverage, measured by the debt-to-equity ratio, was considered to exclude some of the firms selected for the initial group. In this case, firms that presented more equity than debt were excluded, such as Porsche SE, Volvo Car AB, Continental AG and Stellantis NV. Also, Ford was excluded because it showed closely to three times more debt than Mercedes-Benz.

The 5-Year monthly beta is capturing the inherent risk of each firm. It was applied a 25% interval for the lower and upper bound, ending with a peer selection that presented beta values of 1,10 and 1,73. The brands, Ferrari NV and Renault SA were excluded.

For the remaining profitability parameters, Operating Margin, EBITDA Margin and ROIC and an interval that comprised less than the double and more than the half values of this components was applied.

The final peer group is given by Bayerische Motoren Werke AG (BMW), General Motors (GM) and Volkswagen AG (VW).

## 7.2. Multiples

The multiples chosen were the Price to Earnings Ratio (P/E), Enterprise Value to EBITDA (EV/EBITDA) and the Enterprise value to Sales (EV/Revenue), as referred in the Literature Review chapter.

All the multiples were retrieved from Refinitiv Eikon, as forward-looking. On 31<sup>st</sup> December 2023, the respective multiples of the peer group were the above ones.

Moreover, all the values excluding multiples were the forecasted ones. The shares outstanding used were retrieved from Refinitiv Eikon platform.

Company	P/E NTM	EV/EBITDA NTM	EV/Revenue NTM
Bayerische Motoren Werke AG	5,72	5,35	0,87
Volkswagen AG	4,27	4,40	0,67
General Motors Co	4,66	8,80	0,86
<b>Average 3 Peers</b>	<b>4,88</b>	<b>6,18</b>	<b>0,80</b>
<b>Median</b>	<b>4,66</b>	<b>5,35</b>	<b>0,86</b>

*Table 20- Peer multiples*

*Source: Refinitiv Eikon's data*

The results from the peer multiples varied between €32,09 and €84,28. The final value for this analysis was driven by the average peer group multiples,

EV/Revenue		EV/EBITDA		P/E	
	0,80		6,18		4,88
Revenue	150 251 718 582,06 €	EBITDA	28 015 549 037,41 €	Net Profit	10 775 456 930,06 €
<b>Enterprise Value</b>	<b>120 201 374 865,65 €</b>	<b>Enterprise Value</b>	<b>173 229 478 214,63 €</b>	Shares Outstanding	1 035 850 889
Mkt Value of Debt (-)	104 173 377 993,21 €	Market Value of Debt (-)	104 173 377 993,21 €	<b>Target Share Price</b>	<b>50,80 €</b>
Cash & Cash Equivalents (+)	17 209 000 000,00 €	Cash & Cash Equivalents (+)	17 209 000 000,00 €		
<b>Equity Value</b>	<b>33 236 996 872,44 €</b>	<b>Equity Value</b>	<b>86 265 100 221,42 €</b>		
Shares Outstanding	1 035 850 889	Shares Outstanding	1 035 850 889		
<b>Target Share Price</b>	<b>32,09 €</b>	<b>Target Share Price</b>	<b>83,28 €</b>		

Table 21-Multiples analysis: EV/Revenue, P/E, EV/EBITDA  
Source: Own analysis

This methodology contributed to a final result for the Multiples Valuation of €55,39 per share. It should be referred that the EV/Revenue presents a lower value compared to the other multiples and the reason behind this scenario is the forecasted decrease in Revenues for the year of 2024, affected by the decrease in units.

## 8. Target Price

Before moving to the computation of the final share price it is important to analyse how impactful are small changes, in the share price achieved by the different models. As a way to observe this shocks, the below football field analysis accounts for the changes in the share price, triggered by small variations in Cost of Equity, WACC and Perpetuity Growth Rate. For the DCF model, the maximum value (€117,50) represents a 0,40% decrease in the weighted average cost of capital and an increase with the same intensity for g. The minimum value shows the opposite rule. For the Relative valuation, the minimum value represents the share price obtained by the EV/Revenue multiple and the maximum value is linked to the EV/EBITDA multiple. Regarding the DDM, the same changes, as the DCF model, were made, but instead of WACC it was applied to the Cost of Equity. Concluding, it is possible to note that the highest value is retrieved by the Multiples Valuation and the lowest by the Dividend Discount Model, which is clearly less sensitive to core variables movements.

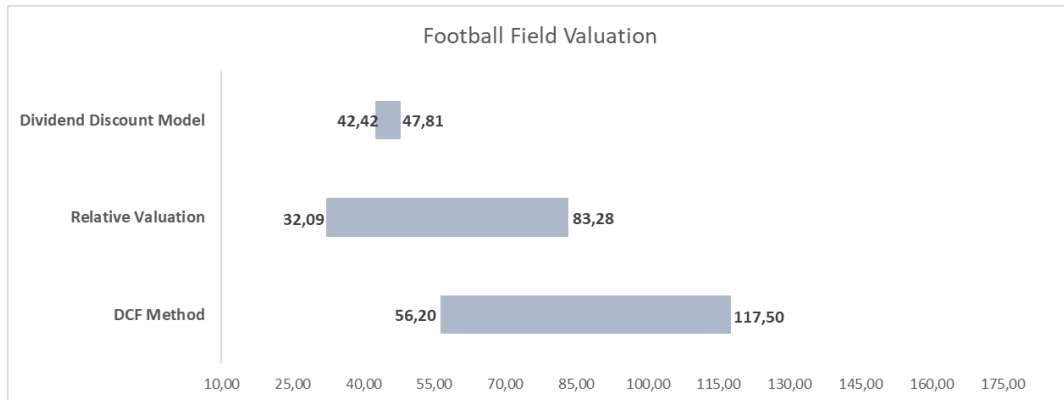


Figure 8-Football Field Analysis  
Source: Own analysis

Currently Mercedes-Benz trades at €70,91 per share. The results for the models performed in this dissertation were €81,31 (DCF Model), €55,39 (Multiples valuation) and €44,92 (Dividend Discount Model). Bearing in mind that the DCF model is the most used model when doing valuations and it is built under the assumption of the company's cash flows reflecting the Mercedes-Benz strategies for the future, a 70% weight was attributed to the share price obtained with this model. Since market competition will impact and drive Mercedes-Benz operations, a 20% weight was attributed to the Multiples Valuation approach. Lastly, the DDM showcase a value way below the current trading price of Mercedes. However, it comprises one crucial stable rule for the future of the company, the distribution of dividends at 40%. Given this information, a 10% weight was attributed to this model.

In essence, the final value estimated for Mercedes-Benz Group AG is 82,71€, with a Buy recommendation for the stock.

Model	Share price	Attributed Weight
DCF	81,31 €	70%
Multiples	55,39 €	20%
DDM	44,92 €	10%
<b>Final Share price</b>		<b>72,48 €</b>

Table 22-Final Share price estimation  
Source: Own Calculations

## 9. Morningstar report Comparison

In this dissertation segment, the equity research of Mercedes-Benz done by Morningstar Research Services LLC will be compared to the one developed in this dissertation. Broadly speaking, the main assumptions of each one will be compared and analysed.

In terms of the DCF Model, Morningstar evaluates Mercedes by applying a three-stage model. In the first two stages different growth rates are applied. These phases last between 5 to more than 15 years and after this period a perpetuity is applied, which assumes that any growth, decline, or investment has a null effect. Besides this description, Morningstar only demonstrates a period of 5 years for the explicit period, even though it tells that the perpetuity year is the 15th. In this dissertation the DCF only considered on single stage of expected period. Additionally, this period comprised the sum of the different segments of Mercedes, each with individual CAGRs.

Since, the methods used to forecast the Discounted Cash Flow model, were not the same, it is still possible compare some main figures, this is growth prospects, the weighted average cost of capital and the final target price.

The information provided on the FCF is very scarce, but it is possible to compare the growth rates by the CAGR. Morningstar predicts a Revenues CAGR for its explicit period (2023-2027) of 3,4%, compared to the one defined in this dissertation, for the period between 2024 and 2031, of 2,86%. Additionally, Morningstar also discloses its expected growth rate for the first stage of the explicit period and the investment rate for the second stage, registered as 3% and 35,3% respectively, which in reality are not possible to compare with the approach of this dissertation.

Furthermore, without mentioning the risk factor used and its value, Morningstar shows a cost of equity of 9% a pre-tax cost of debt of 6,5% and the long-run tax rate applied of 28,5%. This resulted in a value for the WACC of 8,5%.

This dissertation discloses a value of 6,40% for the WACC parameter. It also shows a cost of equity of 12,20%, a pre-tax cost of debt of 3,16% and a steady tax rate of 27,10%. The difference yielded by the weighted average cost of capital is much due to the difference in the

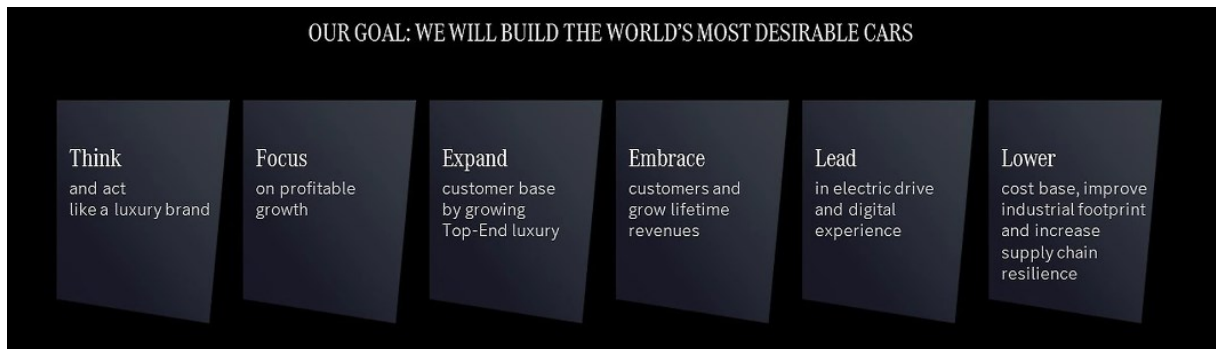
cost of debt, which in this dissertation was computed relying on the bonds outstanding and the Non-Traded cost of debt of Mercedes-Benz and for Morningstar it took into account the spread that the creditors may demand, given Mercedes credit quality.

Bearing in mind the previous information, it is important to note that even though Morningstar showcases a higher discount rate (WACC), it achieves a much higher share price, of €116,00, than the one reached, with the DCF model, in this dissertation. This might happen because Morningstar is using a much higher perpetuity value to sustain its higher discount rate. On the other hand, it may also happen that the FCF calculated on a second stage may be very high in contrast to the ones in an initial stage, which doesn't necessarily imply the perpetual growth rate to be higher than expected.

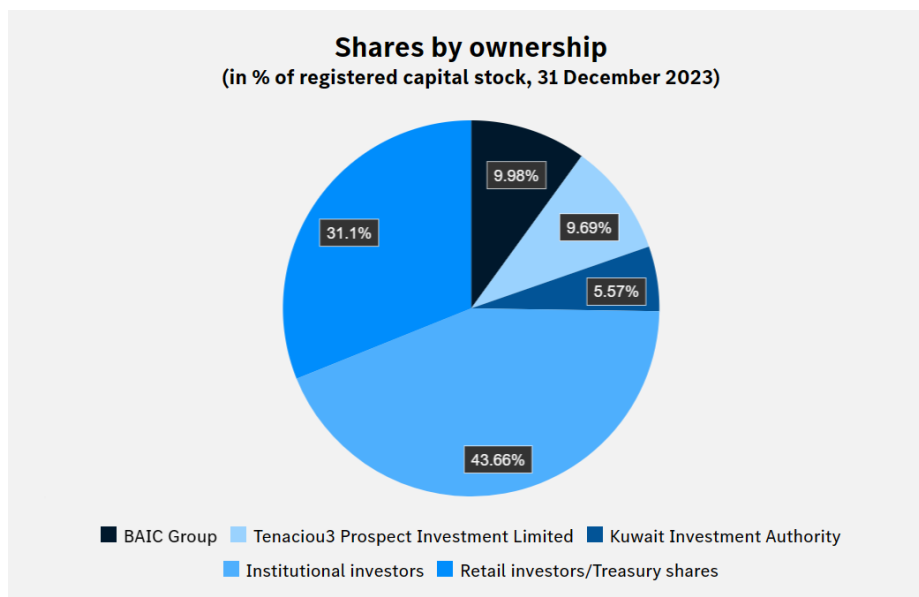
To conclude, the final value that this dissertation presents, in line with the DCF model is of €81,31. Even though Morningstar doesn't reveal a recommendation, it reaches a final fair value of €116.00 for Mercedes-Benz, which is way higher than the current stock price.

## 10. Appendix

### Appendix 1- Mercedes-Benz Cars Strategy



### Appendix 2- Mercedes-Benz Ownership Structure



### Appendix 3- Oica Top Manufacturers

	2019	2020	2021	2022	2023	Position	% of total passenger car production
CHINA	21 389 833	19 994 081	21 444 743	23 836 083	26 123 757	1	38,41%
JAPAN	8 329 130	6 960 411	6 619 245	6 566 356	7 765 428	2	11,42%
INDIA	3 629 008	2 836 534	3 631 095	4 439 144	4 783 628	3	7,03%
GERMANY	4 663 749	3 515 488	3 096 165	3 480 357	4 109 371	4	6,04%
SOUTH KOREA	3 612 587	3 211 706	3 162 727	3 438 355	3 908 747	5	5,75%
SPAIN	2 248 291	1 800 664	1 662 174	1 787 197	1 907 050	6	2,80%
USA	2 511 711	1 924 398	1 562 717	1 703 608	1 745 171	7	2,57%

## Appendix 4- Selection of the matching segments

Commercial vehicles unit sales worldwide(Statista Forecast)	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
Buses	450 000	510 000	410 000	420 000	440 000	430 000	430 000	430 000	420 000	420 000	420 000
Light Commercial Vehicles	21 900 000	22 350 000	18 890 000	21 420 000	20 350 000	20 710 000	20 630 000	20 550 000	20 470 000	20 400 000	20 330 000
Trucks	4 250 000	4 330 000	4 580 000	4 480 000	3 360 000	3 970 000	3 900 000	3 840 000	3 790 000	3 730 000	3 670 000
<b>Total</b>	<b>25 800 000</b>	<b>27 190 000</b>	<b>24 880 000</b>	<b>26 330 000</b>	<b>24 150 000</b>	<b>25 110 000</b>	<b>24 960 000</b>	<b>24 820 000</b>	<b>24 680 000</b>	<b>24 550 000</b>	<b>24 420 000</b>
Passenger cars worldwide unit sales (Statista Forecast)	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
Executive cars	2 000 000	1 550 000	1 260 000	1 540 000	1 560 000	1 890 000	1 690 000	1 800 000	1 890 000	1 890 000	1 930 000
Full-size vans	900 000	890 000	740 000	750 000	830 000	710 000	800 000	810 000	780 000	740 000	740 000
Large Cars	7 410 000	6 280 000	5 340 000	5 450 000	6 150 000	7 040 000	7 450 000	7 510 000	7 610 000	7 670 000	7 770 000
Luxury Cars	260 000	210 000	190 000	150 000	160 000	180 000	180 000	190 000	200 000	200 000	200 000
Medium Cars	16 390 000	13 980 000	9 770 000	9 890 000	10 520 000	12 710 000	13 140 000	13 310 000	13 400 000	13 790 000	14 220 000
Mini Cars	3 470 000	3 510 000	2 830 000	3 280 000	3 040 000	3 160 000	3 250 000	3 310 000	3 390 000	3 380 000	3 430 000
Minivans	5 530 000	4 540 000	3 700 000	4 640 000	4 870 000	5 050 000	5 150 000	5 300 000	5 480 000	5 620 000	5 810 000
Pickup Trucks	4 780 000	4 410 000	4 130 000	4 060 000	3 630 000	3 880 000	4 070 000	4 060 000	3 970 000	3 850 000	3 890 000
Small Cars	10 000 000	9 150 000	6 240 000	7 030 000	7 080 000	8 020 000	8 220 000	8 270 000	8 370 000	8 460 000	8 630 000
Sports Cars	820 000	810 000	680 000	870 000	990 000	1 020 000	1 050 000	1 090 000	1 100 000	1 100 000	1 100 000
SUVs	30 830 000	27 980 000	21 810 000	24 220 000	23 110 000	24 610 000	25 450 000	25 820 000	26 210 000	26 560 000	27 420 000
<b>Total</b>	<b>82 350 000</b>	<b>72 510 000</b>	<b>56 560 000</b>	<b>61 800 000</b>	<b>61 940 000</b>	<b>67 960 000</b>	<b>70 450 000</b>	<b>71 450 000</b>	<b>72 370 000</b>	<b>73 250 000</b>	<b>75 170 000</b>

## Appendix 5- Worldwide passenger cars and Vans forecast (Statista)

Cars Unit sales worldwide	2018	2019	2020	2021	2022	2023	2024E	2025E	2026E	2027E	2028E
Sales	67 670 000	59 160 000	45 160 000	49 070 000	49 570 000	55 160 000	57 180 000	57 970 000	58 750 000	59 660 000	61 300 000
% change		-12.58%	-23.66%	8.68%	1.02%	11.28%	3.66%	1.33%	1.35%	1.55%	2.75%
Average growth rate global sales (2024-2028)		2.14%									

Vans unit sales worldwide	2018	2019	2020	2021	2022	2023	2024E	2025E	2026E	2027E	2028E
Sales	27 530 000	27 780 000	24 330 000	26 810 000	26 050 000	26 470 000	26 580 000	26 680 000	26 730 000	26 760 000	26 880 000
% change		0.91%	-12.42%	10.28%	-2.83%	1.61%	0.42%	0.30%	0.28%	0.11%	0.45%
Average growth rate (2024-2028)		0.31%									

## Appendix 6- Reconciliation Variable

	2021	2022	2023	2024E	2025E	2026E	2027E	2028E	2029E	2030E	2031E
Reconciliation Value	-5 495 000 000 €	-5 755 000 000 €	-6 544 000 000 €	-6 417 308 974 €	-6 643 242 746 €	-6 858 103 832 €	-7 064 506 039 €	-7 263 964 069 €	-7 448 936 936 €	-7 632 794 550 €	-7 815 145 132 €
% of Revenues	3,94%	3,69%	4,10%	4,10%	4,10%	4,10%	4,10%	4,10%	4,10%	4,10%	4,10%

## Appendix 7- Relevant accounts for the NWC

Inventories	☐
Deferred tax assets	☐
Trade receivables	☐
Deferred tax liabilities	☐
Deferred income (current and non-current)	☐
Trade payables	☐
Contract and refund liabilities	☐
Provisions for other risks (current and non current)	☐
Product warranties	☐
Personal and social costs	☐
Litigation risks and regulatory proceedings	☐
Others	☐
<b>Other financial liabilities (Current and Non Current)</b>	
accounting	✗
through profit and loss	✗
Liabilities from residual value guarantees	☐
Liabilities from wages and salaries	☐
Accrued interest expenses	✗
Deposits Received	✗
Other	☐
<b>Other Liabilities</b>	
Income tax liabilities	☐
Other tax liabilities	☐
Other	☐
<b>Other Assets</b>	
Reimbursements due to income tax refunds	☐
Reimbursements due to other tax refunds	☐
Other expected reimbursements	☐
Prepaid expenses	☐
Asset from defined benefit pension plans	☐
Other	☐

## Appendix 8- Net Working Capital historical

Historical Change in operating assets and liabilities	2021	2022	2023
<b>Inventories</b>	<b>21 466 000 000</b>	<b>25 621 000 000</b>	<b>27 294 000 000</b>
<i>DIO as a % of COGS</i>	75,91	80,62	85,88
<b>Deferred tax assets</b>	<b>3 434 000 000</b>	<b>3 725 000 000</b>	<b>4 127 000 000</b>
<i>% of Revenues</i>	2,56%	2,48%	2,69%
<b>Trade receivables</b>	<b>7 673 000 000</b>	<b>8 100 000 000</b>	<b>7 281 000 000</b>
<i>DSO as a % of Revenues</i>	21	20	17
<b>Deferred tax liabilities</b>	<b>4 488 000 000</b>	<b>6 910 000 000</b>	<b>7 714 000 000</b>
<i>% of Revenues</i>	3,35%	4,61%	5,03%
<b>Deferred income (current and non-current)</b>	<b>2 661 000 000</b>	<b>2 625 000 000</b>	<b>2 701 000 000</b>
<i>% of Revenues</i>	1,99%	1,75%	1,76%
<b>Trade payables</b>	<b>10 655 000 000</b>	<b>12 204 000 000</b>	<b>12 828 000 000</b>
<i>DPO as a % of COGS</i>	37,68	38,40	39,40
<b>Contract and refund liabilities</b>	<b>9 909 000 000</b>	<b>10 554 000 000</b>	<b>10 391 000 000</b>
<i>% of Revenues</i>	7,40%	7,04%	6,78%
<b>Provisions for other risks (current and non current)</b>	<b>15 962 000 000</b>	<b>16 023 000 000</b>	<b>15 300 000 000</b>
<i>% of Revenues</i>	11,92%	10,68%	9,99%
<b>Other financial liabilities (Current and Non Current)</b>	<b>4 842 000 000</b>	<b>4 157 000 000</b>	<b>3 981 000 000</b>
<i>% of Revenues</i>	3,62%	2,77%	2,60%
Derivative financial instruments used in hedge accounting	1 420 000 000	2 283 000 000	1 115 000 000
Financial liabilities recognized at fair value through profit and loss	130 000 000	171 000 000	120 000 000
Liabilities from residual value guarantees	865 000 000	733 000 000	519 000 000
Liabilities from wages and salaries	1 055 000 000	952 000 000	864 000 000
Accrued interest expenses	741 000 000	663 000 000	810 000 000
Deposits Received	672 000 000	654 000 000	248 000 000
Other	2 922 000 000	2 472 000 000	2598 000 000
<b>Other Liabilities</b>	<b>3 813 000 000</b>	<b>4 373 000 000</b>	<b>4 202 000 000</b>
<i>% of Revenues</i>	2,85%	2,92%	2,74%
<b>Other Assets</b>	<b>5 609 000 000</b>	<b>6 149 000 000</b>	<b>6 056 000 000</b>
<i>% of Revenues</i>	4,19%	4,10%	3,95%
<b>Working Capital</b>	<b>-14 312 000 000</b>	<b>-13 955 000 000</b>	<b>-12 359 000 000</b>
Change in Working Capital		357 000 000	1 596 000 000



## Appendix 11- Market value of Minority Interests

Current Minority Interests	1043000000
<i>P/B value FY 2024</i>	0,78
MKT value of Minority Interests	813540000

## Appendix 12- Sensitive Analysis

Enterprise Value		WACC									
176 797 377 934		6,00%	6,10%	6,20%	6,30%	6,40%	6,50%	6,60%	6,70%	6,80%	
Terminal Growth Rate	1,60%	181 205 365 251	176 805 215 702	175 598 437 160	168 572 666 136	164 716 570 177	161 019 742 590	157 472 609 811	154 066 349 675	150 792 819 124	
	1,70%	184 667 077 094	180 091 209 270	175 720 809 555	171 542 456 186	167 543 870 508	163 713 797 822	160 041 902 837	156 518 677 673	153 135 360 693	
	1,80%	188 293 749 836	183 530 146 134	178 985 204 512	174 644 324 695	170 494 176 922	166 522 566 704	162 718 316 489	159 071 161 828	155 571 660 012	
	1,90%	192 097 462 598	187 132 958 600	182 401 537 480	177 887 283 137	173 575 695 279	169 453 535 430	165 508 692 609	161 730 065 804	158 107 460 857	
	2,00%	196 091 503 318	190 911 646 322	185 980 668 908	181 281 181 849	176 797 377 934	172 514 856 075	168 420 468 366	164 502 186 680	160 748 985 951	
	2,10%	200 290 523 846	194 879 409 813	189 734 519 575	184 836 809 961	180 169 010 597	175 715 422 315	171 461 742 455	167 394 912 972	163 502 987 948	
	2,20%	204 710 719 544	199 050 804 526	193 676 203 229	188 566 009 971	183 701 311 618	179 064 955 722	174 641 350 311	170 416 290 389	166 376 807 070	
2,30%	209 370 038 045	203 441 919 275	197 820 179 651	192 481 809 514	187 406 045 799	182 574 104 389	177 968 949 847	173 575 096 564	169 378 436 439		
2,40%	214 288 422 817	208 070 583 612	202 182 431 905	196 598 573 417	191 296 155 306	186 254 556 010	181 455 119 430	176 880 926 225	172 516 596 318		
Terminal Value		WACC									
138 892 010 271		6,00%	6,10%	6,20%	6,30%	6,40%	6,50%	6,60%	6,70%	6,80%	
Terminal Growth Rate	1,60%	142 579 559 979	138 361 297 594	134 335 214 758	130 488 957 429	126 811 202 514	123 291 552 593	119 920 443 290	116 689 061 546	113 589 273 329	
	1,70%	146 041 271 822	141 647 291 161	137 457 587 153	133 458 747 480	129 638 502 845	125 985 607 824	122 489 736 315	119 141 389 544	115 931 814 898	
	1,80%	149 667 944 564	145 086 228 025	140 721 982 110	136 560 615 988	132 588 809 259	128 794 376 706	125 166 149 967	121 693 873 700	118 368 114 217	
	1,90%	153 471 657 326	148 689 040 491	144 138 315 078	139 803 574 431	135 670 327 616	131 725 345 432	127 956 526 087	124 352 777 676	120 903 915 062	
	2,00%	157 465 698 046	152 467 728 213	147 717 446 506	143 197 473 142	138 892 010 271	134 786 666 077	130 868 301 845	127 124 898 552	123 545 440 156	
	2,10%	161 664 718 573	156 435 491 704	151 471 297 173	146 753 101 254	142 263 642 934	137 987 232 317	133 909 575 933	130 017 624 844	126 299 442 153	
	2,20%	166 084 914 272	160 606 886 417	155 412 980 827	150 482 301 265	145 795 943 955	141 336 765 724	137 089 183 790	133 039 002 260	129 173 261 275	
2,30%	170 744 232 772	164 998 001 167	159 556 957 249	154 398 100 808	149 500 678 136	144 845 914 391	140 416 783 326	136 197 808 435	132 174 890 644		
2,40%	175 662 617 545	169 626 665 503	163 919 209 503	158 514 864 711	153 390 787 643	148 526 366 013	143 902 952 909	139 503 638 096	135 313 050 523		

## Appendix 13- Treasury Shares



Mercedes-Benz

**Virtual Annual General Meeting of Mercedes-Benz Group AG  
on Wednesday, May 8, 2024 at 10:00 a.m. (CEST)  
from Carl Benz-Arena, Mercedesstraße 73d, 70372 Stuttgart**

**Total number of shares and voting rights - Number of treasury shares at the time of convening the General Meeting \***

As announced in the convocation of the Annual General Meeting of Mercedes-Benz Group AG on 22 March 2024, the share capital of the company at the time of convening the Annual General Meeting is divided into 1,069,837,447 no-par value registered shares, each of which confers one vote to its holder. The total number of voting rights thus amounts to 1,069,837,447. At the time of publication of the convocation of the Annual General Meeting 2024 on 22 March 2024, the company holds 33,986,558 treasury shares, from which the company has no rights.

## Appendix 14- Income statement Forecast

Years	Mercedes-Benz Group										
	2021	2022	2023	2024E	2025E	2026E	2027E	2028E	2029E	2030E	2031E
Revenue	133 893 000 000	150 017 000 000	153 218 000 000	150 251 718 582	155 541 620 878	160 572 272 770	165 404 872 602	170 074 884 894	174 405 748 699	178 710 500 506	182 979 967 434
Cost of sales	-103 218 000 000	-115 997 000 000	-118 839 000 000	-120 201 374 866	-124 433 296 702	-128 457 818 216	-132 923 898 082	-136 059 907 916	-139 524 598 952	-142 968 400 405	-146 383 973 947
Gross profit	30 675 000 000	34 020 000 000	34 379 000 000	30 050 343 716	31 108 324 176	32 114 454 554	33 080 974 520	34 014 976 979	34 881 149 738	35 742 100 101	36 595 993 487
Selling Expenses and General Administrative Exp	-12 002 000 000	-12 066 000 000	-12 416 000 000	-12 576 293 784	-13 019 066 526	-13 440 139 620	-13 844 635 461	-14 235 522 481	-14 598 022 265	-14 958 336 436	-15 315 697 210
Research and non-capitalized development	-5 467 000 000	-5 602 000 000	-6 230 000 000	-5 699 123 368	-6 155 053 237	-6 893 659 626	-7 858 771 973	-8 644 649 171	-9 336 221 104	-9 803 032 160	-9 999 092 803
Other Operating Income	2 888 000 000	3 323 000 000	2 206 000 000	2 103 524 060	2 177 582 692	2 248 011 819	2 315 668 216	2 381 048 389	2 441 680 482	2 501 947 007	2 561 719 544
Other Operating Expense	-1 735 000 000	-1 289 000 000	-516 000 000	-1 248 001 713	-1 291 940 026	-1 333 724 987	-1 373 864 913	-1 412 654 375	-1 448 626 845	-1 484 382 427	-1 519 844 930
Profit/Loss on equity method investments	1 352 000 000	1 732 000 000	2 129 000 000	1 803 020 623	1 866 499 451	1 926 867 273	1 984 858 471	2 040 898 619	2 092 868 984	2 144 526 006	2 195 759 609
Other Financial Income/expense, net	317 000 000	340 000 000	108 000 000	150 251 719	155 541 621	160 572 273	165 404 873	170 074 885	174 405 749	178 710 501	182 979 967
Earnings Before Interest and Taxes (EBIT)	16 028 000 000	20 458 000 000	19 660 000 000	14 583 721 253	14 841 888 150	14 782 381 685	14 469 633 733	14 314 172 844	14 207 234 738	14 321 532 592	14 701 817 665
Interest Income	212 000 000	273 000 000	678 000 000	502 938 098	511 841 311	509 789 155	499 003 646	493 642 380	489 954 484	493 896 190	507 010 802
Interest Expense	-429 000 000	-427 000 000	-254 000 000	-188 416 338	-191 751 759	-190 982 958	-186 942 369	-184 933 871	-183 552 270	-185 028 956	-189 942 100
Profit before income taxes	15 811 000 000	20 304 000 000	20 084 000 000	14 898 243 014	15 161 977 701	15 101 187 883	14 781 695 010	14 622 881 353	14 513 636 952	14 630 399 826	15 018 886 367
Income taxes	-4 761 000 000	-5 495 000 000	-5 553 000 000	-4 122 786 084	-4 195 769 300	-4 178 946 953	-4 090 533 791	-4 046 585 338	-4 016 354 170	-4 048 665 923	-4 156 171 681
Profit from continuing operations	11 050 000 000	14 809 000 000	14 531 000 000	10 775 456 930	10 966 208 401	10 922 240 929	10 691 161 218	10 576 296 014	10 497 282 782	10 581 733 903	10 862 714 686
Profit/Loss from discontinued operations after tax	12 346 000 000	--	--	--	--	--	--	--	--	--	--
Net profit	23 396 000 000	14 809 000 000	14 531 000 000	10 775 456 930	10 966 208 401	10 922 240 929	10 691 161 218	10 576 296 014	10 497 282 782	10 581 733 903	10 862 714 686
thereof profit attributable to non-controlling interests	390 000 000	308 000 000	270 000 000	200 218 386	203 762 733	202 945 775	198 652 091	196 517 784	195 049 642	196 618 826	201 839 720
thereof profit attributable to shareholders of Mercedes-Benz Group AG	23 006 000 000	14 501 000 000	14 261 000 000	10 575 238 544	10 762 445 668	10 719 295 155	10 492 509 128	10 379 778 230	10 302 233 140	10 385 115 077	10 660 874 967
Earnings per share (in euros) for profit attributable to shareholders of Mercedes-Benz AG											
Basic	21,5	13,55	13,46	10,32	10,66	10,61	10,39	10,28	10,20	10,28	10,56
Diluted	21,5	13,55	13,46	10,32	10,66	10,61	10,39	10,28	10,20	10,28	10,56

## Appendix 15- Partial Balance Sheet

	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
<b>Other assets (Current and Non-Current)</b>	5609	6149	6056	5 939	6 148	6 347	6 538	6 722	6 893	7 064	7 232
<b>Inventories</b>	21466	25621	27294	28 283	29 279	30 226	31 136	32 015	32 830	33 640	34 444
<b>Trade Receivables</b>	7673	8100	7281	7 140	7 391	7 630	7 860	8 082	8 288	8 492	8 695
<b>Share Capital</b>	3070	3070	3070	3070	3070	3070	3070	3070	3070	3070	3070
<b>Provisions for other risks (Current and Non-Current)</b>	15962	16023	15300	15 004	15 532	16 034	16 517	16 983	17 416	17 846	18 272
<b>Deferred Tax Liabilities</b>	4488	6910	7714	7 565	7 831	8 084	8 328	8 563	8 781	8 997	9 212
<b>Deferred Income</b>	1175	1234	1223	2 649	2 742	2 831	2 916	2 998	3 075	3 150	3 226
<b>Contract and Refund Liabilities (Current and Non-Current)</b>	9909	10554	10391	10 190	10 549	10 890	11 217	11 534	11 828	12 120	12 409
<b>Other Liabilities (Current and Non-Current)</b>	3813	4373	4202	4 121	4 266	4 404	4 536	4 664	4 783	4 901	5 018
<b>Trade Payables</b>	10655	12204	12828	12 975	13 432	13 866	14 284	14 687	15 061	15 433	15 801

## Appendix 16- Peers Financial Services

Company	Revenue Per Year						Historical average
	2017	2018	2019	2020	2021	2022	
BMW Financial Services	27 567 000 000	28 165 000 000	29 598 000 000	30 044 000 000	32 867 000 000	35 122 000 000	5,00%
% Change		2,17%	5,09%	1,51%	9,40%	6,86%	
Volkswagen Group Financial Services	30 191 000 000	31 592 000 000	36 446 000 000	37 223 000 000	41 006 000 000	43 857 000 000	7,85%
% Change		4,64%	15,36%	2,13%	10,16%	6,95%	
<b>Final Average</b>							<b>6,43%</b>

## Appendix 17-Yield Converter

Currency	10-Year Bond Yields	5-Year Bond Yields	2-Year Bond Yields
Norwegian Krone	3,68%	3,64%	4,35%
Chinese Yuan	2,30%	2,17%	1,88%
South African Rand	10,76%	9,42%	7,58%
US Dollar	4,35%	4,34%	4,69%
British Pound	4,05%	3,90%	4,20%
Hong Kong Dollar	3,77%	3,46%	3,73%
Malaysian Ringgit	3,90%	3,71%	3,53%
Canadian Dollar	3,56%	3,60%	4,20%
Swiss Franc	0,68%	0,75%	0,92%
Australian Dollar	4,10%	3,74%	3,73%
Japanese Yen	0,75%	0,37%	0,20%
Hungarian Forint	6,80%	6,57%	6,54%
South Korean Won	3,43%	3,37%	3,36%
Currency	10-year	5-year	2-year
Euros	2,37%	2,37%	2,85%

## References

- Koller, T., Goedhart, M. & Wessels, D. (2010). *“Valuation Measuring and Managing the value of Companies”*, 5<sup>th</sup> edition. McKinsey Company Inc.
- Damodaran, A. (2007). Valuation Approaches and Metrics: *“A Survey of the Theory and Evidence”*. Foundations and Trends® in Finance, 1(8), 693-784.
- Damodaran, A. (2011). The little book of valuation: how to value a company, pick a stock and profit. John Wiley & Sons
- Damodaran, A. (2012). Investment Valuation: *“Tools and Techniques for Determining the Value of Any Asset”*, 3<sup>rd</sup> edition. ed. New Jersey, United States: John Wiley & Sons Inc.
- Rosenbaum, J., & Pearl, J. (2021). Investment Banking Valuation, LBOs, M&A, and IPOs. (3<sup>rd</sup> edition). New Jersey, United States: John Wiley & Sons, Inc.
- Cegłowski, B., & Blażej, P. (2012). Equity shares equating the results of FCFF and FCFE methods. e-Finanse: Financial Internet Quarterly, 35
- Hooke, J.C. (2010). Security Analysis and Business Valuation on Wall Street: A Comprehensive Guide to Today’s Valuation Methods. (2<sup>nd</sup> edition). New Jersey, United States: John Wiley & Sons, Inc.
- Luehrman, T. A. (1997). What’s it worth? A general manager’s guide to valuation. Harvard business review, 75(3), 132-142
- Bruner, R. F., Eades, K.M., Harris, R. S., & Higgins, R. C (1998). Best practices in Estimating the Cost of Capital
- Pignataro, P. (2013). Financial Modeling and Valuation : A practical guide to Investment Banking and Private Equity. Hoboken, New Jersey: John Wiley & Sons, Inc.
- McKinsey & Company. (2020). Valuation: Measuring and Managing the Value of Companies (7<sup>th</sup> ed). Hoboken, New Jersey: John Wiley & Sons, Inc.
- Foerster, S., & Sapp, S. (2005). The Dividend Discount Model in the Long-Run: a clinical study. Journal of Applied Finance,
- Pinto, J., (2010). Equity asset valuation. New Jersey: John Wiley & Sons Inc.
- Liu, J., Nissim, D., & Thomas, J. (2002). Equity valuation using multiples. Journal of Accounting Research, 40(1), 135-172
- Plenborg, T., & Pimentel, R.C. (2016). Best Practices in applying Multiples for valuation purposes. The journal of private equity, 19(3), 55-64
- Albuquerque, A. (2009). Peer firms in relative performance evaluation. Journal of accounting and Economics, 48(1), 69-89

Bhojraj, S., & Lee, C. M. (2002). Who is my peer? A valuation-based approach to the selection of comparable firms. *Journal of accounting research*, 40(2), 407-439

Goedhart, M., Koller, T., Wessels, D. (2005). The right role for multiples in valuation. *McKinsey on Finance*, 15(1), 7-11

Fernandez, P. (2001). Valuation using multiples. How do analysts reach their conclusions? *IESE Business School*, 1, 1-13.

## **Websites**

[Tracking global data on electric vehicles - Our World in Data](#)

[The state of the global automotive manufacturing market \(agenzia nova.com\)](#)

[Sales Statistics | www.oica.net](#)

[S&P Global Mobility forecasts 88.3M auto sales in 2024 - Dec 14, 2023 \(spglobal.com\)](#)

[Volkswagen Group \(volkswagen-group.com\)](#)

[BMW Group - English](#)

[Official Global Website | Stellantis](#)

[Improving electric vehicle economics | McKinsey](#)

[World Economic Outlook \(October 2023\) - Real GDP growth \(imf.org\)](#)

[Historic harmonised inflation Europe – HICP inflation Europe](#)

[Daimler Truck becomes independent following successful spin-off - BNP Paribas CIB](#)

[val2daypres08.ppt \(nyu.edu\)](#)

[Home | Mercedes-Benz Group](#)

[General Motors: Pushing the Limits of Transportation & Technology \(gm.com\)](#)

[Powering better investment decisions - MSCI](#)

[Statista - The Statistics Portal for Market Data, Market Research and Market Studies](#)