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MASTER'S THESIS

ESG AND COMPANY VALUATION: THE CASE OF MERCEDES BENZ

Ljubljana, January 2026 ALEKSA TOŠKOVIĆ

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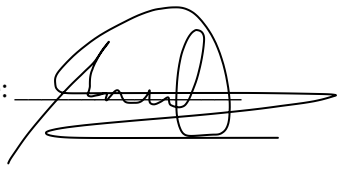
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ABSTRACT

This thesis examines the integration of Environmental, Social, and Governance factors into company valuation, focusing on Mercedes-Benz Group AG as a case study. The research addresses the growing importance of ESG in financial decision making and its implications for valuation models, particularly within the automotive industry undergoing a major sustainability-driven transformation. Using a Discounted Cash Flow approach, the study evaluates a base case and two scenarios: a base case reflecting current operations, a scenario emphasizing accelerated electrification of the product portfolio, and a scenario prioritizing cost optimization through sustainability-oriented investments in R&D and CAPEX. The analysis incorporates adjustments to key valuation drivers such as revenue, cost structure, and Weighted Average Cost of Capital, including a regression-based beta estimation linked to EV share in production. Results indicate that proactive investment in sustainable production processes yields the highest estimated share price, underscoring the strategic value of ESG integration for long-term competitiveness. The findings highlight ESG as a critical determinant of enterprise value and advocate for embedding sustainability into core business strategies to enhance resilience and shareholder returns.

KEY WORDS: ESG, Company valuation, Automotive industry, Mercedes-Benz, DCF, Sustainability, WACC

SUSTAINABLE DEVELOPMENT GOALS



POVZETEK

To magistrsko delo preučuje vključevanje dejavnikov okoljskega, družbenega in upravljavskega v proces vrednotenja podjetja, s poudarkom na študiji primera skupine Mercedes-Benz. Raziskava obravnava naraščajoč pomen ESG pri finančnem odločanju in njegove posledice za modele vrednotenja, zlasti v avtomobilski industriji, ki je sredi obsežne trajnostne preobrazbe. Z uporabo metode diskontiranih denarnih tokov naloga ocenjuje tri scenarije: osnovni primer, ki odraža trenutno poslovanje, scenarij, ki poudarja pospešeno elektrifikacijo produktnega portfelja, ter scenarij, ki daje prednost optimizaciji stroškov prek trajnostno usmerjenih naložb v raziskave in razvoj ter kapitalske izdatke. Analiza vključuje prilagoditve ključnih dejavnikov vrednotenja, kot so prihodki, stroškovna struktura in tehtano povprečje stroškov kapitala, vključno z regresijsko oceno beta koeficienta, povezano z deležem električnih vozil v proizvodnji. Rezultati kažejo, da

proaktivne naložbe v trajnostne proizvodne procese prinašajo najvišjo ocenjeno ceno delnice, kar poudarja strateško vrednost vključevanja ESG za dolgoročno konkurenčnost. Ugotovitve potrjujejo ESG kot ključen dejavnik vrednosti podjetja in zagovarjajo vključevanje trajnosti v temeljne poslovne strategije za povečanje odpornosti in donosnosti za delničarje.

KLJUČNE BESEDE: ESG, vrednotenje podjetja, avtomobilska industrija, Mercedes-Benz, DCF, Trajnost, WACC

CILJI TRAJNOSTNEGA RAZVOJA



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LIST OF ABBREVATIONS

BEV – Battery Electric Vehicle(s)
Bio - Billion
BS – Balance Sheet
CAGR – Compound Annual Growth Rate
CAPM – Capital Asset Pricing Model
CAPEX – Capital Expenditure
CFS – Cash Flow Statement
COGS – Cost of Goods Sold
D&A – Depreciation and Amortization
DCF – Discounted Cash Flow
ECB – European Central Bank
EBIT – Earnings Before Interest and Tax
EBITDA – Earnings Before Interest, Tax, Depreciation and Amortization
ESG – Environment Social Governance
EU – European Union
ICR – Interest Coverage Ratio
ICE – Internal Combustion Engine(s)
IS – Income Statement
KPI – Key Performance Indicator
MFR – Micro Factory Retailing
Mio - Million
NOPLAT – Net Operating Profit Less Adjusted Taxes
NWC – Net Working Capital
OEM – Original Equipment Manufacturer(s)
OPEX – Operating Expense
pp – Percentage Point(s)
PP&E – Purchase of Property Plant & Equipment
PV – Present Value
PY – Prior year
R&D – Research and Development
ROA – Return on Asset
ROE – Return on Equity
SDG – Sustainability Development Goals
SoM – Share of Market
US – United States
USD – United States Dollar
YoY – Year over Year

1 INTRODUCTION

In recent years, Environmental, Social, and Governance (hereafter: ESG) factors have emerged as significant elements in the valuation process of a company. This shift is driven by an increasing recognition of the financial relevance of ESG issues, changing regulatory landscapes, and evolving investor preferences (Peterdy, 2023).

Thesis explores the growing importance of ESG in the valuation process of a company. It delves into how ESG factors are integrated into traditional financial analysis with a specific focus on the Environmental part and the impact this integration has on the company's valuation.

The selected company comes from an Automotive industry. This particular industry was picked as it is in the middle of a major transformation process. The transformation was intended to tackle 3 main issues concerning car manufacturers (PwC, 2021):

1. Climate change and Carbon emissions;
2. Sustainability along the value chain and
3. Digital Responsibility.

Due to these reasons, companies within the industry are more oriented to sustainability as a new concept of doing business going forward, along the way preparing thorough reports about their dedication to this new concept, which represents a good pool of information for the purpose of the research.

The company selected for valuation and analysis is Mercedes-Benz Group AG, a German automotive manufacturer with a long-standing global reputation and a leading position within the industry. This research empirically examines how investments in ESG-enhancing initiatives influence the company's valuation, using two distinct scenarios. The first scenario assesses how shifting the production portfolio toward lower-carbon, more environmentally neutral products affects the firm's financial performance and ultimately its share price. The second scenario focuses on deepening sustainability within existing manufacturing operations, evaluating how additional investments and operational improvements aimed at reducing environmental impact translate into changes in corporate value. Together, these scenarios aim to answer the central research question: Do increased sustainability efforts enhance company value, despite the associated upfront investment costs?

Thesis begins with the "Literature review" chapter, where we delve into the foundation and reasoning behind the research. Here we define the importance of sustainability as a concept in the modern-day business and how it is being implemented within the automotive industry. We also define what is ESG and sustainability reporting and what are some of the challenges regulators encounter. Within the chapter called "Valuation of Mercedes Benz" we firstly describe the economy and the industry in which the company

operates in. Also, we present the company as a whole, its business segments, its products and goals before diving into financial analysis and forecasts presented in each scenario. At the very last chapter called “Conclusion”, scenario with the highest valuation is being highlighted and a short overview of the research is given before concluding the thesis.

2 LITERATURE REVIEW

In the Literature review part, we are synthesizing existing scholarships for the purpose of setting a base of further topic examination. We present the key sources of information based on which the thesis is built upon, covering with it important ESG and Valuation related literature.

2.1 Definition and Significance of ESG

The following section contributes to a better understanding of ESG as a concept and how it became an important factor in our everyday work and lives. While providing an overview of the ESG origins, it also delves into how companies report and present their sustainability initiatives and what are some of the misuses of sustainability reporting as such.

2.1.1 Definition and Components of ESG

ESG is an acronym and stands for Environmental, Social, Governance. It represents a framework that provides to the related parties information, regarding how the company is managing its risks and favourable situations when it comes to those 3 criteria (Peterdy, 2023).
Before going any further into discussion about the importance and overall significance of ESG in the modern finance, separate factors that are contained within this unified concept, should be explained, and delved into separately. The factors are respectively:

1. Environmental, the term ‘environmental factors’ pertains to the ecological footprint of an organization and its strategies for managing risks. This encompasses both direct and indirect emissions of greenhouse gases, the company’s guardianship over natural resources, and its overall ability to withstand physical climate threats such as climate change, floods, and wildfires (Peterdy, 2023).

2. Social, the ‘social’ component relates to a company’s interactions with its stakeholders. This can include metrics related to human capital management such as equitable pay and employee satisfaction, as well as the company’s influence on the communities where it operates. A distinguishing feature of ESG is the extension of social impact expectations beyond the company itself to its supply chain partners.

This is particularly relevant in developing economies where environmental and labor standards may not be as stringent (Peterdy, 2023).

3. Governance, ‘Corporate governance’ refers to the leadership and management structure of an organization. It is important to gain a deeper understanding of how the incentives of the leadership align with stakeholder expectations, the respect for shareholder rights, and the internal controls in place to ensure transparency and accountability from the leadership (Peterdy, 2023).

2.1.2 Origins of ESG as a concept

The concept of ESG can be traced back to the 1950s and 1960s, a time when the idea of corporate social responsibility began to take shape. Howard Bowen's seminal work, "Social Responsibilities of the Businessman," sparked the conversation about corporate accountability. However, this was a period dominated by institutional investors focused primarily on shareholder profits, so the thought of anything other than that was unthinkable. After some years well in the 1960s, the surge in social activism began, with movements advocating for civil rights, women's rights, and opposition to the Vietnam War. These movements pressured companies and investors to consider the broader social impact of their actions. The first Earth Day in 1970, initiated by U.S Senator Gaylord Nelson, marked a significant shift towards environmental conservation, highlighting the need for legal mechanisms to protect the environment. When 1971 came, the Pax World Funds was created, becoming the first mutual fund in the U.S to consider social and environmental factors in its investment decisions. This laid the foundation for what would eventually become known as ESG investing. Decade later, United Nations established a body, which had a purpose of investigating the interplay between human activity and the environment, thus underscoring the need for policies to balance economic growth and environmental sustainability as such (ESGgo, n.d.).

The base for ESG frameworks was set in 1992, when the first ever Earth Summit took place in Rio de Janeiro. The United Nations Framework Convention on Climate Change that was signed, had put the environmental issues at the forefront of business decision making, while the annual Conference of the Parties meetings were controlling that the countries remained committed to their sustainability pledges. Two significant milestones that have mainstreamed ESG as a concept were creation of “Kyoto Protocol” in 1997 and UN’s “Principles for Responsible Investment” in 2006. They emphasized the importance of reduction of greenhouse gas emissions while embedding the ESG factors into investment decision process (ESGgo, n.d.).

In 2012, a conference of United Nations devoted to sustainability and development called Rio+20, was crucial for creation of Sustainable Development Goals (hereafter: SDG). On this conference it was not communicated specifically what exact goals should be, but rather it was discussed how these goals can be implemented and communicated in the

most fluent way, impacting all three perspectives of sustainability. These objectives should be aligned with the United Nation's agenda beyond 2015 and was decided that a 30 member "Open Working Group" would be in charge of the project dedicated to preparing the proposal on the SDGs. The outcome of the Rio+20 conference was a document named "The future we want", which emphasized the importance of inclusive green economies, resilient institutions and it also resembled the start of SDG formulation (United Nations, 2012).

At the beginning of 2015, the General Assembly started the preparation of post-2015 development agenda. The result was subsequent approval of the 2030 Agenda for Sustainable Development, which revolved around 17 SDGs, during the Sustainable Development summit of UN in 2015. The proposed 17 goals included diverse range of targets and life impacting segments amongst which are quality education, zero hunger, gender equality, affordable and clean energy and many more that directly change the way we look at the world around us. This marks a great milestone of the General Assembly's work and a good base for further development in sustainability efforts. Nowadays, Division for Sustainable Development Goals offers great deal of help for building up the capacities and knowledge for SDGs implementation and continuous resolution of issues they are tackling (United Nations, 2015).

2.1.3 ESG Scores and Rating agencies

ESG score is used to numerically express how the company is being rated from the perspective of this three-letter acronym. As ESG as a concept is still relatively new, there is no standardised approach to calculate the ESG Score for each company. This is why we have several commercial organisations with different approaches when it comes to creating the final number reflecting the company's environmental, social and governance impact. Some of the more famous ones are: Bloomberg, S&P, MSCI, Sustainalytics and Refinitiv. For the purpose of this master thesis, we will be looking at Refinitiv's way of rating companies and what are the specificities when it comes to the process of scoring (Deloitte, 2022).

Refinitiv collects and calculates more than 500 company level ESG Key performance Indicators (hereafter: KPIs) and then classifies them into 10 categories to create 3 pillar scores and their respective weights. The weights for Governance pillar are same for all of the industries that the companies belong to, but for E and S pillars they are adjusting depending on the selected company's industry. The Final ESG Score, ranges from 0 to 100% depending on the company's pillar ratings and at the end the company is assigned a grade. For example, Grade D is given for the rating in a range of 0% – 25% as a worst score, all the way to grade A that is given for the rating in a range of 75% – 100%. The table below shows in more depth how the grades are being distributed over the entire rating scale. Grade "D" indicates that company in relative ESG terms is performing

poorly and the level of transparency of material ESG data, appears insufficient. Grade "C" indicates that the company is on a satisfactory level when it comes to relative ESG performance and has a moderate degree of transparency in reporting material ESG data publicly. Grade "B" represents a good relative ESG performance practice and above average level of transparency in reporting material ESG data publicly. Grade "A" is the best possible score to have as a company, indicating excellent relative ESG performance and a high degree of transparency of material ESG data publicly. Each grade band covers a 25-point quartile with the movements within the grade band of 8 points (Deloitte, 2022).

2.1.4 Growing importance of ESG Reporting

ESG reporting as such encourages responsible investment, helps manage risks, and contributes to a company's overall sustainability efforts. As the world becomes more conscious of environmental and social issues, ESG reporting continues to play a crucial role in shaping business practices and investor decisions, more and more as the time passes, steadily becoming an incremental part of valuation process alongside the financial analysis.

2.1.4.1 Sustainability reports

A sustainability report is a document that reveals non-financial performance policies, methodologies, and metrics to both internal and external stakeholders. Unlike an ESG report, which evaluates a company's performance against specific ESG metrics, a sustainability report takes a broader view by considering the organization's business model and ethical practices in relation to the world around it. Essentially, it aims to promote responsible and ethical business practices by emphasizing the company's commitment to societal well-being (Krantz & Jonker, 2023).

While ESG reports provide specific data on ESG performance, sustainability reports encourage a holistic approach to responsible business practices, considering the organization's role in the larger ecosystem. Both play essential roles in promoting transparency and accountability, but they serve different purposes and audiences. Companies analyze their sustainability practices using ESG metrics and share this information in annual reports. These reports provide insights that can shift companies toward circular economic models, emphasizing reuse and responsible resource management. Preparing and publishing sustainability reports has its benefits for the company willing to provide them. Four main benefits that arise from Sustainability report preparation are as follows. First of the four is Enhanced Risk Management. As awareness of worsening climate conditions and work environment improvements increases, sustainability reports help organizations calibrate the impact that their operations have on the environment. This provides the opportunity for the company to effectively manage potential hazards that are arising from ESG issues. The second one is Cost Optimization

and Savings. Comprehensive sustainability reports allow organizations to rethink their business models, striking a balance between financial success and sustainability efforts. Constantly reporting on the achievements and goals relating to sustainability can have a positive effect on attracting investors interested in environmentally aware companies. As a third one comes Improved Stakeholder Engagement. With ESG closely tied to company performance, stakeholders demand transparency. Sustainability reports demonstrate company's commitment to sustainability issues, fostering better engagement with partners and the public. The last one, equally important benefit for the company is having Informed Decision-Making. By comparing their ESG activities to broader sustainability movements, companies gain valuable insights that they can act upon. This informed decision-making process adheres to improvement of sustainability driven efforts and alignment with regulatory standards (Krantz & Jonker, 2023).

Regulatory frameworks governing sustainability disclosures exhibit considerable variation across jurisdictions. Within the European Union (hereafter: EU), firms are increasingly subject to comprehensive legal mandates designed to enhance transparency in ESG practices. A prominent example is the Corporate Sustainability Reporting Directive, which obliges companies to systematically report on the ecological and societal consequences of their operations, alongside their ESG-related strategies. In contrast, ESG reporting in the United States (hereafter: U.S.) remains largely voluntary at the federal level, with California being a notable exception due to its recent enactment of climate disclosure laws. Despite the absence of nationwide mandates, many U.S. corporations opt to disclose ESG metrics, recognizing their growing relevance to investors and stakeholders. Regulatory oversight is nonetheless present through the Securities and Exchange Commission, which monitors for misleading ESG claims and potential misconduct such as greenwashing. Independent rating agencies like Bloomberg and S&P Dow Jones Indices, contribute to the ESG landscape by evaluating corporate exposure to sustainability risks. These assessments are increasingly integrated into investment analyses alongside traditional financial indicators. Momentum for mandatory sustainability reporting is also evident in other regions. Brazil will enforce upon publicly traded companies to publish their annual climate and sustainability disclosures starting from 2026, guided by the standards of the International Sustainability Standards Board (hereafter: ISSB). Similarly, Australia is set to introduce statutory climate-related financial reporting for large entities in 2024, with its standards aligned with ISSB principles and administered by the Australian Accounting Standards Board (Krantz & Jonker, 2023).

2.1.4.2 Greenwashing as a side effect

Greenwashing is the practice of presenting inaccurate or deceptive data about how environmentally friendly company's products are. Greenwashing is the act of making unfounded claims in order to trick consumers into believing that products made by

the business are environmentally friendly or have a bigger positive environmental impact than they actually do. The act of greenwashing is most likely to happen when the company wants to put aside the negative effect its business has on the environment by magnifying some of its product's sustainable qualities. The term itself first came up back in the 1960s, when in the Hospitality industry, hotels were asking their visitors to reuse the towels to save the environment and by that grasped the profits from lowering laundry costs (Hayes, 2024).

As the world becomes a place where the trend of demand for environmentally friendlier products (healthier products, recyclable, less wasteful) is in a upward rising trajectory, companies through the upper mentioned process, are trying to cash in on that. Biggest environmentally hazardous companies like energy companies, are trying to rebrand themselves into the purest environmentally friendly companies by changing the names of their products, altering products brand to appear more ecological, or just changing their packaging. Companies have engaged in greenwashing by using press releases and ads to emphasize their clean energy or pollution reduction initiatives, while in actuality, the corporation is not willing to adhere to environmental activities it claimed (Hayes, 2024).

Not all companies are contributing to the growing popularity of the Greenwashing, but it is necessary that consumers are protected by all of the firms that do. In America, Federal Trade Commission provides guidelines on how to notice if the product is really a green one or is being greenwashed. When it comes to data that some of those companies present, they are usually "cherry picked" covering only the activities and products that are leaning more towards the green side while totally fading out most of the ones that are harmful for the ecosystem (Hayes, 2024).

Some of the examples of greenwashing (Hayes, 2024):

- When a trash bag is labeled as 'recyclable,' it implies an environmental benefit. However, since trash bags are typically not separated for recycling at landfills, this claim is deceptive, as there is no meaningful benefit in practice;

- If a plastic package containing an item is labeled as 'recyclable', it remains unclear whether the package or the item itself can be recycled, the label becomes misleading if any part of the package or its contents cannot actually be recycled;

- While technically accurate, the claim that an area rug has "50% more recycled content than before" can be misleading. In reality, the manufacturer only increased the recycled content from 2% to 3%, which does not constitute a significant amount of recycled fiber.

2.2 Sustainability in automotive industry

The purpose of this section is to identify and discuss the key drivers of sustainability within the industry under examination. We explore transformation areas in the automotive sector, outlining the principal challenges companies encounter and the benefits that emerge from overcoming these obstacles throughout the transition.

2.2.1 Goals and drivers behind industry's sustainable transformation

Main goal for car manufacturers when it comes to sustainability, is finding the right balance between legislation and consumer experience while having in mind the cost part of that equation. As the current mainstream topics of emission free vehicles and carbon neutral production mounts, so does the pressure on the whole industry to be more sustainable, creating the need for new business strategies that would be aligned with the shifts in the mindset of consumers in the sense of how the car as a vehicle is being perceived as well as the legislation evolution. There are 4 main drivers of automotive industry transformation that can be listed in the following way: Electromobility, Car sharing services, Self-driving vehicles and Connectivity between the vehicles (PwC, 2021).

Apart from the awareness of the consumers and policy makers, a big role in this transformation, play investors and lenders. Climate risk is something that is of significant importance to them, before their decision to contribute to the company. They want to understand weather or not the organisation is an eco-friendly one or are they going to damage their sustainability reputation with the investment in that same organisation/company. In the very centre of this transformation, stand three issues that need deeper understanding and resolution (PwC, 2021):

1) Climate change and carbon emission

In the recent years carbon emissions have been in the focus of the legislators, from the perspective of car producers, during the very making of the vehicle all the way to the car's very own emissions. In regard to that, fuel cells as an alternative power source play a vital role (PwC, 2021).

2) Sustainability throughout the value chain

Resources from which the cars are being made of, by their very nature are scarce and getting even more scarce with each passing day. Having this in mind, the necessity of sustainability along the whole supply chain becomes a quite logical concept. Through recycling and secondary use of the materials, followed by transparency with every step of the supply chain the scarcity issue may be tamed, embracing sustainability (PwC, 2021).

3) Digital responsibility

Autonomous vehicles that are interconnected with other machines on the road, carry a burden of data protection and security as well as the potential of digital value unlocking. Before all that to be even considered, car producers need to define what technologies and digital functions are needed for those sustainable solutions to be implemented. With this in hand goes the need for stringent rules from the lawmakers for the data to be properly stored and protected (PwC, 2021).

2.2.2 Sustainable business models and practices within the industry

Business practice to be called sustainable, within the industry of automotives, it needs to provide significant range of innovative business solutions for the latest world's concerns with minimum negative externalities to the environment. Strategies need to be mindful of the whole production cycle, from the very beginning of gathering raw materials and their processing, through the manufacturing process and finally the end-of-life product (automotive) disposal and/or reusage. Key goals for implementation of more sustainable strategies and practices contain reduction of greenhouse gases and their emission from the vehicles, resource conservation, promotion, and buildup of circular economy principles and at the very heart of everything, fair and ethical labor conditions. For it to be feasible to implement these sustainably oriented strategies, some challenges may need to be overcome (Wells, 2013):

- Vehicle pollution and environment – greenhouse gas emission
- Sophisticated supply chain – often global with many different stakeholders around the globe, ensuring sustainability along the whole chain is thus complex.
- Waste made up of batteries and electronic parts – increasing number of Electric vehicles are main cause of concerns regarding recycling and end of life disposal activities revolving around "the cars of the future".
- Transitional costs – moving from the previous traditional way of doing business to a more sustainable one comes at a huge upfront cost relating to research, development and infrastructure modification which may defer some smaller companies.
- Consumer perspective and the demand for more sustainable vehicles – cost of producing a sustainable vehicle consumers demand may not be profitable for the companies to produce.

On the other side, new improved business models bring potential opportunities to make the environment greener. In the following are the potential opportunities, industry can make a use of in the future (Wells, 2013):

- E-mobility – reduction of carbon footprint making the future significantly greener.
- Material innovations – making materials more bio based and reusable, vehicles may have an improved environmental profile.
- Sharing mobility and services – vehicle and service sharing may lower the overall number of cars on roads which reduces the total emission and fuel usage.
- Circular Economy – remanufacturing and recycling as a concept can lead to waste reduction, lowering the pollution of the environment.
- Public-Private Partnerships – collaboration between the private sector companies and public institutions may have as an effect spreading awareness about sustainability and the challenges world faces as well drive systemic changes of the industry.

One of the more interesting examples of a sustainable model within the industry, Micro Factory Retailing or MFR, a hypothetical concept developed by the authors Wells and Nieuwenhuis in 1999, serves as an indicator in which way the business should develop. The concept will in the following, be seen through the spectrum of 3 dimensions that are of great significance when it comes to model's sustainability (Wells, 2013).

Economic point of view – the concept revolves around merging manufacturing and distribution under one entity, using alternative materials which are more competitive to the standard all steel way of building cars, at smaller volumes due to lower fixed costs of the technology implemented. This is important as the model tries to catch the cost efficiency from being close to the market. Model implies one way of doing business, by having decentralized manufacturing with small plants requiring an incremental investment cost when compared to the traditional automotive plants, and by being close to the market it serves, cuts the distribution costs that may vary from 25% to 40% of the price of the car. Having small plants in different geographies and markets, brings amongst distribution cost cuts many other benefits. Smaller expansion costs to new territories, change in products on market-to-market basis based on the preference of the consumers on the specific markets, adapting to the market needs more efficiently, factories become a local place for repairs, spare parts servicing and etc., no conflict of interest between manufacturer and retailer which is commonly seen with the mainstream way of doing business, where manufacturer has higher control over commercial part of the business (Wells, 2013).

Social point of view – there are two important characteristics in which MFR model is in social sustainability sense, more feasible than the traditional way of doing business within the industry. The primary aspect is that the consumer has access to eco friendlier products, in line with their preference. The secondary aspect pertains to labor, wherein MFR enables diverse, engaging, and fulfilling work opportunities, while also promoting job stability across different geographical regions (Wells, 2013).

Environmental point of view – shift in product technology, which incidentally can lead to the creation of lightweight, environmentally friendly cars, not only alters the competitive landscape but also lays the groundwork for a more viable way of doing business. For instance, alternative vehicle designs and materials lend themselves well to flexible repair, resulting in significantly reduced economic costs for such activities. Consequently, the financial incentive to discard a vehicle diminishes, and vehicle life cycle can substantially increase as it remains gradually updated with the latest technologies, yielding environmental benefits. Manufacturers can view the vehicle as an asset to be kept and rented to consumers, ensuring constant future revenue sources. Benefits from transitioning to this way of working can be reflected in a few key points. Plants can potentially serve as a hub for trades, where used vehicles are being resold and/or recycled, making materials readily available on site locally, taking away the cost of transportation. Another one is a potential transition of the plant, shifting the focus from new car production to service and repair-based plants, making the plants less dependent of continued sale of new cars. Important to note that this then suppresses the trend of over production which has a positive impact on the environment. And the main takeaway is that manufacturing process of these kind of plants has a less invasive impact on the local environment when compared to traditional, high volume means of production plants, requiring lesser land when being set up (Wells, 2013).

2.3 Review of sources related to ESG Performance enhancement and its implications on the Valuation process

Explaining how ESG enhancement actions impact some of the key valuation parameters is very delicate and requires considering couple of different perspectives before making any further assumptions. For clarity in assumption making, we consider the guidance of several renowned books and articles.

1. Valuation and Sustainability: A Guide to Include Environmental, Social, and Governance Data in Business Valuation – written by Dejan Glavas

In his book, he discussed how and what should be considered when implementing additional ESG enhancing initiatives. Main elements highlighted as most affected and the ones to be focused on are: Capital Expenditures (hereafter: CAPEX), Research and Development (hereafter: R&D), Operating Expenses (hereafter: OPEX) and Weighted Average Cost of Capital (hereafter: WACC). These elements are taken into consideration within the scenarios, influencing valuation and the final estimated price of the share. Cost related elements are prone to be increased in the short term to ensure more sustainable and cost-efficient future (investing in new technology, digitalization etc) as the writer suggests (Glavas, 2023).

Book further proposes a framework for adjusting the beta coefficient in equity valuation to reflect ESG-related risks and opportunities. It argues that firms with strong ESG

profiles, particularly those investing in sustainable technologies and governance practices, may exhibit lower systematic risk, justifying a downward adjustment of beta in the capital asset pricing model (hereafter: CAPM). With adjusting the beta, certain impacts are assumed on the WACC of the company. Book suggests that the adjustment of WACC should not be beyond +/- 1pp mark as it resembles a significant factor in the valuation process, directly impacting the resulting price. This adjustment reflects the market's perception of reduced volatility and long-term resilience (Glavas, 2023).

2. Corporate Finance for Long-Term Value - written by Schoenmaker, D., & Schramade, W.

In "Corporate Finance for Long-Term Value", Schoenmaker and Schramade (2023) reconceptualize traditional corporate finance by embedding sustainability into the heart of financial decision-making. The book puts in its centre the argument that R&D and CAPEX are not merely operational necessities but strategic levers for enabling sustainability transitions and achieving long-term value creation. The authors emphasize that R&D investments are pivotal in developing sustainable innovations, directly contributing to low-carbon technologies implementation, circular economy solutions enhancement, and even socially inclusive business models creation. These investments often entail mid-term payback periods, which may not align with short-term financial metrics but are essential for building future competitiveness and resilience. By fostering innovation, R&D enables companies to anticipate and adapt to pressures coming from regulatory shifts that the governments are imposing to abide to broader sustainability goals, changing consumer preferences with products being more diverse or technological disruptions which all resemble key drivers of sustainability transitions (Schoenmaker & Schramade, 2023).

When looking at CAPEX, decisions are reframed as opportunities to align business operations with the Sustainable Development Goals. Highlighting that forward-looking capital investments in renewable energy infrastructure or sustainable supply chains, can yield both environmental and financial returns over time. While these investments often involve higher upfront costs, they tend to lead to generation of positive externalities, contributing to operational efficiencies in the medium to long term. Notably, such investments can also lead to reductions in the Cost of Goods Sold (hereafter: COGS) through improvements in energy efficiency, reducing and recycling material waste, and optimizing production processes. Although the authors do not explicitly quantify this relationship, their framework implies that sustainability focused R&D and CAPEX can enhance cost structures by lowering input and operational costs over time (Schoenmaker & Schramade, 2023).

A key argument in the book is that financial, social, and environmental value creation increasingly converge over the long run. This alignment is reinforced by external mechanisms such as regulation and consumer behavior. Consequently, R&D and CAPEX

become instruments not only for growth but also for strategic positioning in a transitioning economy. By embedding sustainability into capital budgeting and investment appraisal, the authors offer a methodology for assessing ESG impacts through adjusted discount rates, scenario analysis, and multi-capital valuation, thus capturing the full spectrum of value generated by corporate investments (Schoenmaker & Schramade, 2023).

Ultimately, the book positions R&D and CAPEX as essential drivers of sustainable transformation and cost optimization, urging decision-makers to adopt a forward-looking perspective that moves beyond short-termism and embraces the complexity of long-term value creation.

3. Cost reduction, competition, and industry performance - written by Spence, M.

Michael Spence's theoretical model in "Cost Reduction, Competition, and Industry Performance" provides a foundational framework for understanding how strategic investments in R&D and CAPEX influence firm-level cost structures and industry dynamics. Although the study is not empirical in the conventional econometric sense, it employs a calibrated simulation approach to illustrate the quantitative implications of cost-reducing investments under different market conditions (Spence, 1984).

Spence models R&D and CAPEX as fixed costs that contribute to the accumulation of firm-specific knowledge, which in turn reduces marginal production costs over time. The model incorporates a dynamic learning function, where the rate of cost reduction depends on both the firm's own investment and the spillover effects from competitors. This structure allows for the simulation of industry outcomes under varying degrees of competition and knowledge diffusion (Spence, 1984).

To empirically illustrate the model's predictions, Spence introduces a numerical example using a constant elasticity demand function and a cost function that declines exponentially with accumulated knowledge. The calibrated parameters demonstrate that sustained investment in R&D and CAPEX leads to significant reductions in unit costs, particularly when spillovers are internalized or supported through policy mechanisms such as subsidies (Spence, 1984).

For the purposes of this thesis, Spence's model provides theoretical justification for the assumptions being made in regard to intensive investment in R&D and CAPEX that lead to measurable reductions in COGS. The simulation results suggest that the benefits of such investments are not immediate but accrue over time as knowledge and process efficiencies compound. This aligns with contemporary ESG-aligned investment strategies, where long-term value creation is prioritized over short-term cost minimization. Spence's work supports the inclusion of a lagged cost-reduction effect in financial modelling, particularly when evaluating the impact of sustainability-driven innovation and infrastructure investment. The model's emphasis on spillovers and

strategic behaviour further reinforces the importance of governance and policy support in realizing the full potential of ESG-aligned CAPEX and R&D initiatives (Spence, 1984).

3 VALUATION OF MERCEDES BENZ

In this part of the thesis the objective is to derive and explain how the whole valuation process started, developed and at the end concluded. It tends to explain what the idea behind the model is and what are some of the assumptions taken into consideration while tackling different aspects of business that Mercedes Benz Group holds.

Consisting of 6 fundamental sub parts, the idea is to step by step adhere to the reader's understanding of the model, and assumptions behind each scenario, that have been developed on the basis of variety of different analysis and findings. First and the second sub part named "Company background" and "Macro and Automotive industry overview" are dedicated to explaining the economic environment in which the company operates as well as business segments and goals that are contributing to the success of the company. Third one called "Data sources" gives insight of several key data sources needed to conduct the valuation. Fourth subtopic is "Discounted Cash Flow model", here we in detail derive each segment of the model that is specific for the subjected method, explaining calculations performed and highlighting main points. Fifth section referred to as "Valuation scenarios – Overview and assumptions" is dedicated to presenting all the assumptions making each scenario unique and clarifying reasons behind them. At the very end of the "Valuation process" chapter, stands "Scenarios – Calculations and Results" sub part, which exists to unite, compare and explain the differences in outcomes between observed scenarios with the valuation date - 31.12.2023, and give a background for the "Conclusion" part of the thesis.

3.1 Company background

The company that is being evaluated for the purpose of this thesis, has a tradition dating back as far as 135 years in the past. It's founders and visionaries, also the inventors of the automobile, were Karl Benz and Gottlieb Daimler who, back then, already had remarkable achievement in pioneering within the automotive engineering, set a firm base on which the company has continuously developed on, making it the modern automotive powerhouse even after all this time. Nowadays Mercedes Benz Group has its operations spread around the world, making it one of the biggest manufacturers of luxury brand vehicles and commercial vans in the higher price class segment (Mercedes-Benz Group, 2024a).

There are 3 business divisions that together run Group's operations:

1) Mercedes Benz Cars

2) Mercedes Benz Vans
3) Mercedes Benz Mobility

Combined, these three divisions made Mercedes Benz brand one of the most valuable brands on the planet. Alongside the core business divisions, as a complementary Mercedes Benz has a range of financing and leasing products that help end customers and dealer houses. These products include management of the fleet services, service of building charging infrastructure, innovation in the field of digital mobility, acting as a broker of insurance of the cars and etc (Mercedes-Benz Group, 2024a).

The Group has its vehicles present in almost every country in the world, alongside the production centres in over 30 locations ranging from Asia and Europe all the way to both Americas and Africa. As of year 2023, Group has launched a new agency retail model called "Retail of the Future". This new concept has already been implemented in Germany and UK but also not skipping out on countries like Sweden and Austria, adding up to 50% of total new sales generated in Europe through the highlighted concept. The ideal of the company is that other countries in Europe and further start with the implementation, to try and reduce the costs related to distribution with the direct sales the model imposes. Turkey, India and Australia are in addition just a few of the countries that are currently transitioning from traditional way of retail to the abovementioned methodology. When it comes to the portfolio of all-electric vehicles, Mercedes Benz has made a huge step, producing as much as 12 different electric models and producing them on three different continents with the intent of expanding to other parts of the world (Mercedes-Benz Group, 2024a). As previously mentioned, Mercedes Benz Group has three main business segments, which will be dived into more deeply in the following part of the section.

1. Mercedes-Benz Cars

Being seen as a luxury car manufacturer, this business segment is in a constant drive to produce the most prestigious automobiles on the market. Key component of this segment's business strategy is sustainability. As the plan to have its whole fleet of cars carbon neutral throughout its entire supply chain by 2039, sustainability as such, plays a vital role for the company. This is to be achieved with a complete electrification of its vehicle portfolio, thus lowering the emissions of the products to zero going forward. Mercedes Benz Cars segment brings to the market a wide range of products, covering all 3 price segments: Top-end, Core and Entry category. It's top end portfolio of products includes cars such as G-class, S-class, Maybach, whilst in the Core category, which makes the Mercedes brand recognisable, company holds the C-class and E-class models and their derivatives. Entry category, while being the cheapest part of the segment's business, represents a way of acquiring new consumers who will in the future advance to the higher brand categories, which makes this segment rather important.
The technology of vehicle autonomy has been a part of the segment's product evolution.

With intelligent networking of the cars and development of self-driving systems, Mercedes Benz Cars is trying to establish the leadership in the area of digital experience, also by forming their own databases and updatable operating systems called MB.OS. Markets holding significant portion of the segment's sales are for the year 2023 - China on the first place contributing with 36% of the total sales, followed by U.S with 15%, on the third place is Germany as the biggest market in Europe contributing with 11% of the total sales, and the rest of EU and European countries making up around 21% (Mercedes-Benz Group, 2024a).

2. Mercedes-Benz Vans

This part of Mercedes-Benz business on its own, represents a worldwide manufacturer of diverse van models. Vans are being grouped by the purpose of use; in this case they are split in 2 segments: the commercial segment and the private one. Some of the more famous ones are Sprinter, Vito and Citan within the commercial segment, as for the private segment, Mercedes-Benz offers vans like V-class and T-class and their variations. Also, this business unit, depending on the location, sells the vans diversified by their size. For example, in Europe large vans, midsized and small sized vans are being sold while in America there are only larger vans, which is in line with the customer preference. When it comes to the ambitions and aim of the Mercedes-Benz Vans, it is to become the leader of electrical driving vehicles, already electrifying most of its current product line, offering both traditional and e-versions of the standard products. From 2026, all newly evolved vehicle models will be constructed in line with all-electric architecture that Mercedes-Benz developed called VAN.EA, combined with the use of earlier mentioned modular MB.OS to merge and enhance its digital support system. Production centres being used for van creation are spread in a wide range of countries like Germany, Spain, the U.S and Argentina while in China, production is carried out through Fujian Benz Automotive Co., Ltd joint venture. Besides these already mentioned locations, Mercedes-Benz Vans plans to open a new polish plant in the near future that will be the first ever all electric vehicle production plant, marking a huge milestone in the Group's ambitions of becoming a greener (zero CO2 emission) company (Mercedes-Benz Group, 2024a).

Unit sales of the van segment were highest during 2023 in Germany as a single market contributing with 25% of total sales. Other part of Europe including markets like EU, UK, Switzerland and Norway had a stake of 37% in total sales while the US and China respectively contributed with 17% and 7% of total sales of the Group (Mercedes-Benz Group, 2024a).

3. Mercedes-Benz Mobility

This division of the Group exists to enhance the sale of the Group's vehicle brands globally with different kinds of financing options and mobility packages. Through

financial leases or different types of contracts, with the end consumer or dealers or even insurance companies and fleet management businesses, this segment of operations boosts the overall sales of the company. Estimate of around 4.3 million vehicles is being directly leased/financed by Mobility business unit in over 30 markets, indicating the strong ability and flexibility that the unit has when offering financial support to the consumers. Besides its core business, Mobility segment unifies all the initiatives related to EV charging. Helping the Group build up and extend its network of power charging with already built 1.5 million public charging points. In addition to everything already mentioned, the unit is implementing Mercedes-Benz Pay platform to a wide range of Group's applications, enabling subscription and rental models such is Mercedes-Benz Rent as well as investing in firms operating within the mobility industry (Mercedes-Benz Group, 2024a).

3.2 Macro and Automotive industry overview

This chapter provides an overview of the macroeconomic environment and the automotive industry in which the company operates. By analysing major global economic regions and examining key trends such as raw material price fluctuations and foreign exchange rate movements, we aim to present a comprehensive picture of the financial and operational outlook for the automotive sector.

3.2.1 World economy overview

During the 2023 reporting year, performance of the world economy was developing in a way that was beating the expectations, ending up with a 2.7% growth on the global level, 0.3 percentage points (hereafter: pp) lower than the last year growth rate and only a slight dip compared to the long-term growth trend. Monetary policies squeezing the growth potential were partially offset by the looser fiscal policies accompanied by lower inputs cost. Huge differences were to be seen between different geographies. On one side, European and Chinese economies reported generally weaker growth numbers, and on the other side, showcasing the ability of U.S economy to sustain the negative macro impacts but also countries like India and Brazil who were able to beat the forecasts in these tough conditions, resulted at the end with a positive world economy percentage growth. Opposite to that, global trade has shrined by approximately 2% during the up-mentioned reporting year (Mercedes-Benz Group, 2024a).

In the following, we will look at the 3 big economic zones impacting the business of Mercedes Benz and their overall economic performance (Mercedes-Benz Group, 2024a):

US Economy – avoiding recession and a strong growth rate despite U.S central bank interest rate increase, puts American economy high up the ladder on the global scale. Inflation percentage steadily declined to 4.1% on average, lower than previous years but still well above the target that central bank has put. In complementary to this, salaries

have increased which implied that an average American had more money to spend, which all led to a 2.5% economy growth on a year-over-year (hereafter: YoY) basis (Mercedes-Benz Group, 2024a).

Euro zone – with the modest growth of only 0.5%, Euro zone had a significantly weaker economic performance than previously evaluated American economy. Reasons for this underperformance were mainly: still high energy prices compared to pre-pandemic levels, although lesser impact then the year before, causing the industry to cope with negative externalities and shrinking it throughout the whole year; consumption of consumers decrease due to high inflation of 5.4% and souring interest rates; tightening monetary policy by European Central Bank (hereafter: ECB) (Mercedes-Benz Group, 2024a).

Chinese economy – with the end of zero-Covid policies, expansion of Chinese economy was robust but has not maintained the momentum throughout the whole year. Source of this disturbance of growth was ultimately highlighted to be a weakening of republic's real estate sector, followed by consumer's overall dissatisfaction and distrust. The negativity of the situation was partially offset and stabilised by government intervention and gradual monetary policy loosening, this resulted in astonishing gross domestic product growth of 5.2%, by which China achieved its goal for the year. Inflation was at a low level of 0.2%, significantly lower than the previously mentioned two economies (Mercedes-Benz Group, 2024a).

3.2.1.1 Energy and raw material prices

The comparison is done with the year 2022 when the prices of raw materials and energetics were at their peak. Throughout 2023, prices plunged but remained on the higher scale then they were in a pre-pandemic period. For example, crude Oil price per barrel fell under 80 USD, resulting in 9% decrease YoY. Gas as an energetic in Europe fell significantly compared to the prior year (hereafter: PY) by around 60%, nevertheless remained above the price level than from before the Covid era. When it comes to raw materials, price tag at the end of the year concluded at a level 3% lower than the ones at the end of PY (Mercedes-Benz Group, 2024a).

3.2.1.2 FX rates evolution

Volatility was present in 2023 when it comes to strength of the Euro. Compared to USD, range was between 1.05 and 1.13 USD per Euro, ending the year approximately 3% stronger than USD at the end of the PY. When compared to Chinese renminbi, value of Euro fluctuated between 7.2 and 8.1 renminbi per Euro, being 6% more valuable YoY against the Chinese currency (Mercedes-Benz Group, 2024a).

3.2.2 Automotive industry overview

Impact that automotive industry has on European economic flourishment is significant. This sector of economy employs a total of 13.8 million people in a direct, as well as in indirect way, making up an astonishing 6.1% of total EU employment. Regarding manufacturing of vehicles, 2.6 million workers are contributing, marking an 8.5% of total EU employment in manufacturing. When looking at EU as a whole, it belongs in the very top of global production of automotives and the industry of automotives is the largest investor in Research and Development (hereafter: R&D) segment. Importance of automotive industry can be seen through the perspective of 3 significant factors. First being the links that the industry has with other sectors, meaning that it represents an economy multiplier, enhancing the performance at the same time with its operations both upstream and downstream industries within its supply chain. Second factor, an important one, is employment. As previously mentioned, the industry employs workers within the EU, both directly and indirectly. Around 3.5 million works within sales, maintenance workers add up to 4.5 million and transport approximately 5.1 million. The third and the major factor is economy in general. The output of the industry sums to above 7% of EU's GDP. The advantage that EU can use is to conduct and implement a wide range of beneficial trade agreements and investments with third world countries, to try and help European companies maintain the position that they have when it comes to economies of scale (European Commission, (n.d.)).

In regard to the current position of European Original equipment manufacturers (hereafter: OEM) on the EU market, data related to the market share indicates that their leadership stance may be overthrown by the new competitors entering the stage. Majority of the % share taken from European companies goes to Chinese entrants, without a trend of slowing down in the coming period. During the 2019 period, analysts from McKinsey Center for Future Mobility have found that European OEMs have lost 6pp within their own local market, while on Chinese market the loss was a bit less, around 5pp. On the other hand, Chinese OEMs have reached 45% of share in their home market and are expected to increase their presence on the EU market by 8 times the share they had in 2019, during the period from 2020 to 2022 (Cornet et al., 2023).

When looking at the structure of the market price classes, comprehensive analysis done by McKinsey indicates that the premium segment as such, represents a stronghold for most of European OEMs. The data behind this statement is that 71% share of the total global sales of premium class vehicles belongs to European OEMs. This naturally attracts other industry companies to try and enter the segment with new innovations and ideas, making the market more competitive as the time passes. Only in 2022, new entrants captured 18% of the premium segment share (Cornet et al., 2023). The disruption that is taking place on the market is mainly driven by an accelerating shift from Internal Combustion Engine (hereafter: ICE) vehicles to zero-emission ones, with the global EV sales increasing by more than 50% annually since 2020 (IEA, 2024). By mid 2030s it is

expected for the global mobility market to reach near total EV transition, with European OEMs already announcing a release of over 150 new EV models by the end of 2030. As the industry is transitioning, another shift is happening in parallel. The focus is moving away from hardware to software and digital tech. Based on the analysis consumers oriented more towards EVs are more than twice as likely to switch to brands that have superior in-vehicle technology such are advanced driver assistance systems and connectivity services embedded within the vehicle. Apart from the OEMs, transformation is ongoing also in the European Suppliers landscape. Main reason behind it is the fact that one third of the value of battery electric vehicles (hereafter: BEV) can be attributed to the battery. This, combined with the uprising trend of vehicle electrification, puts the pressure on the companies supplying the key automotive players, to adapt to rapidly changing business environment (Cornet et al., 2023).

Uncertainty around the future is a thing that every industry and company faces, even if the current environment does not imply that any risk may soon arise. This is why it is important to always be mindful of the future, and to plan ahead. There are 5 factors that have been highlighted as the main drivers of the storm that may appear in the near future of the automotive industry (KPMG International, 2023).

1. Demand plunge

Due to economic instability and possible recession scenarios, even if the supply of cars in the following decade has a positive trend, the demand might not materialize as expected after the pandemic years (KPMG International, 2023). The period after the pandemic years is expected to be a flourishing one for the OEMs. Consumers are exiting the period of constraints which lasted for around 2 years and are more willing to spend, but as the macroeconomic situation worsens, combined with growing geopolitical tensions, the industry's demand may fail to achieve the post pandemic expectations, shrinking it to the levels lower than before the pandemic (KPMG International, 2023).

2. Changing socio-demographic environment

When it comes to socio-demographic conditions, they are rapidly changing. For the purpose of better understanding of what the situation might be in the year 2030, Germany will serve as a subject, as it represents Europe's largest market.

Consumer age group in Germany from which the consumers were the primary new car buyers, are between the 45 years and 64 years of age. Approximately 47% of the total new car sales are contributed by the consumers belonging to the upper-mentioned age group, as the buyers below 45 years of age represent 29% and the ones over 64 years the remaining 24%. The specific age group (45-64) are going to shrink in size for about 10% from the current market proportion. This makes up of around 2.5 million people within the next decade, which represents a major impact on the future new car sales in Germany. Same situation is with the rest of EU market as the most optimistic expectation is that the

demographic group 45 – 64 will shift downwards by no less than 2%. This trend coupled with the changing consumer preferences of younger age population, which prefer different ways of mobility such are rentals, vehicle sharing or public transport, represents one of the biggest obstacles for OEMs when it comes to direct new car sale to the consumer in the future (KPMG International, 2023).

Potential threat for the future car sales may be the fact that the real purchasing power of consumers is degrading, combined with the high constant increase in car prices. In the past there was always a strong correlation between new car sales and purchase power, a total of 0.77 correlation suggests that these two parameters go hand in hand throughout time. This bond remained intact even with all the disruptions of the supply chain system and the pandemic, during a period of over 2 years. As energy prices and inflation rate skyrocketed, factor such is purchasing power shows indications that it might continue to weaken in the future period as well. Most of the disposable income of consumers is being allocated to basic human necessities like food and healthcare, rather than to luxury items (KPMG International, 2023).

3. Transition towards electric vehicles (EVs)

Main topic revolving around EVs is the amount of resources needed for production of the vehicle than it is needed for the traditional ICE vehicle. Parts needed for creation of one EV engine, with similar or better performance measures than the ICE engine, are much fewer than the ones needed for that very same ICE engine. In addition to the before mentioned advantage of production of EVs, parts that are required for the EV engine come already assembled, thus cutting the assembly time with the tendency to shorten it even further as the experience in this relatively new part of the automotive industry begins to rise. Taken into consideration that EVs are still more expensive than the traditional ICEs, this additional cost for producing an average EV of up to 50% of total production cost, can be dedicated to the battery. If taken out of the equation, the residual of EV's parts is cheaper to make than the whole ICE vehicle by around 4.5 thousand EUR. With all of this stated, there are two important takeaways. First one is that the value of OEM supplier market is going to gradually decline as the industry transitions to EVs, and the second crucial takeaway is that by reducing the battery price, electric vehicles will gain a cost advantage over its more traditional internal combustion engine "competitor". With a shift towards EVs, OEMs will not only need to retool, but the recombination of their operations and supply chain shall as well be required. When it comes to operating side of business, EV's components require less intensive labor to be produced, mainly driven by intense automation, which will as a result have a drop in manpower and related costs needed in production (KPMG International, 2023).

4. High debt of suppliers

Predictions of depletion of car volumes and the focus switch to lower price segment, pertains to be the reason for fear for many current suppliers, as their financial situation weakens. Going hand to hand there is a need for intensive innovation which with itself carries a significant CAPEX in this very crucial point in time, adding pressure to already heated environment. Cash flow going from the company to before mentioned expense is expected to additionally worsen the current financial stability of many supplier companies. When looked at 2017 onward the number of financially instable suppliers has risen by around 9%. Indications are that the companies supplying OEMs will require additional funding for them to be able to avoid total financial breakdown. The banking sector has over the past couple of years become more diligent when making lending decisions to companies in "bad" cash flow situation coupled with high interest rates when considering refinancing options of their current debt, making it even harder for the suppliers to obtain urgently needed liquidity. This is why some OEMs offer their prime suppliers, with a strong business case for their upcoming transformation regarding EV component production, a source of funding while the crisis persists (KPMG International, 2023).

The way that majority of component producers operate is based on the just-on-time concept which by itself implies a very specific option of financing, mainly depending on short term borrowings. Looking at the mean supplier's debt portfolio, the category of debt that takes up to 49% of the total debt is the one maturing within 2 years of activation, leaving 31% to the debt category maturing between two and five years of time and approximately 20% to the long-term debt group (>5 years) (KPMG International, 2023).

5. Price parity early appearance

To be able to predict the time when such a thing as a cost parity between ICE vehicles and EVs will happen, there are certain elements that must be considered. Prices of traditional ICE cars is expected to have a upward trend throughout the next 10 years, steered by a factor known as inflation, while EVs are expected to enjoy a steady drop of battery costs, in spite of supply chain and resource boundaries. The decrease in cost is mainly due to a net positive effect of ever-growing economies of scale and constant technology innovations (KPMG International, 2023).

3.3 Data sources

For the purpose of conducting the valuation of Mercedez Benz Group, certain data needed to be collected, analysed and at the end, adjusted to fit the needs of the model.

These inputs are segregated to 2 main groups, based on their nature and necessity:

1) Financial related data and,
2) Volume related group of information.

3.3.1 Financial related group

There is a variety of different sources being used to conduct thorough financial valuation. In the following is the list of key data providers considered in the study alongside with the information obtained:

1) Capital IQ Pro platform – used for extracting Financial Statements of the company for all the years covered within the model, sourcing Peer companies' financial data, share price, beta estimates and so on;
2) Kroll website and report – for determining Risk Free rate and Equity risk premium that are crucial for the cost of capital estimation (Kroll, 2024);
3) Bundesbank Monthly report December 2023 – this report is used with the aim of determining terminal value growth rate (Deutsche Bundesbank Eurosystem, 2023);
4) Annual reports from the past years (2020 – 2023) – mainly being used for further clarification of financial data seen in the Capital IQ Pro, but also for further estimations of different aspects of the financial statements (Mercedes-Benz Group, 2024a) (Mercedes-Benz Group, 2023a) (Mercedes-Benz Group, 2022) (Mercedes-Benz Group, 2021);
5) Annual Sustainability reports – used for developing several key assumptions based on which the scenario analysis is performed (used for both Financial and Volume related matters within the scenarios) (Mercedes-Benz Group, 2024).

3.3.2 Volume related group

Behind every Financial aspect of the model stands the volume driven strategy and total market estimation. For the purpose of defining these two crucial parameters we obtain data from the following sources:

1) International Organization of Motor Vehicle Manufacturers data base (OICA) – Global sales of passenger cars derived from their statistics (OICA, 2023);
2) The International Energy Agency (IEA) – EV sales trend and share of the total commercial vehicles market in the years before 2024, covered within the model (IEA, 2024).

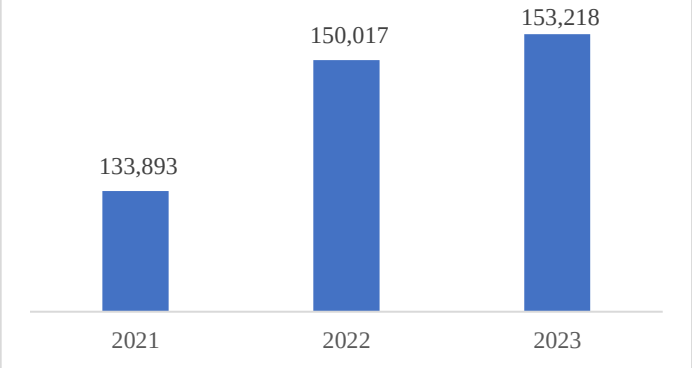
3.4 Financial Analysis

Before diving into the technical aspect of the Valuation model, it is necessary to dedicate a part for analysing the historical performance of the company and highlighting some financial parameters, with the purpose of preparing the base for further company evaluation. Period being analysed ranges from 2021 till 2023. Focus is being put on sales as a key figure from which other metrics are being derived from, such are earning margins, cost forecasts in comparison to the total sales being generated by the company,

cash flow margins, all with the aim of determining the trend the company is expected to follow going forward after the year 2023.

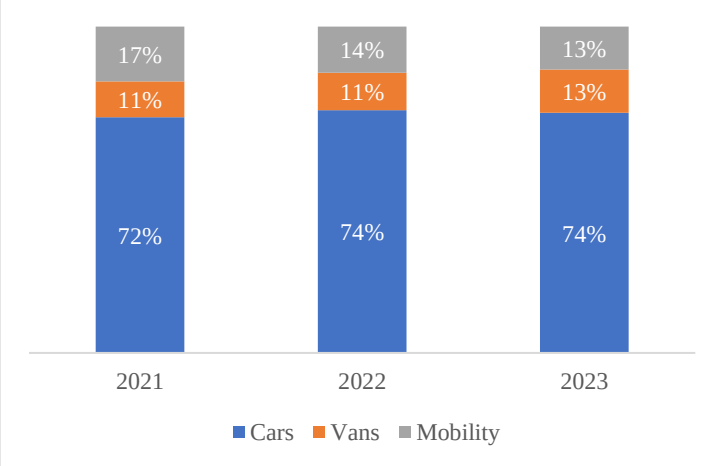
Total revenue of the company in the years after devastating COVID-19 has been growing, which can be clearly seen in the YoY increase of 12% from 2021 to 2022 and stabilizing on this level throughout 2023 with only 2.1% growth in sales versus PY. As presented on Figure 1 the absolute increase is approximately by 20 billion EUR in revenue in the looked at period when comparing the initial and the latest year.

Figure 1: Total Revenue in million EUR (2021-2023)



Source: Own work based on Mercedes-Benz Group (2024a), Mercedes-Benz Group (2023a), Mercedes-Benz Group (2022).

Figure 2: Share of total revenue per business segment (2021-2023)

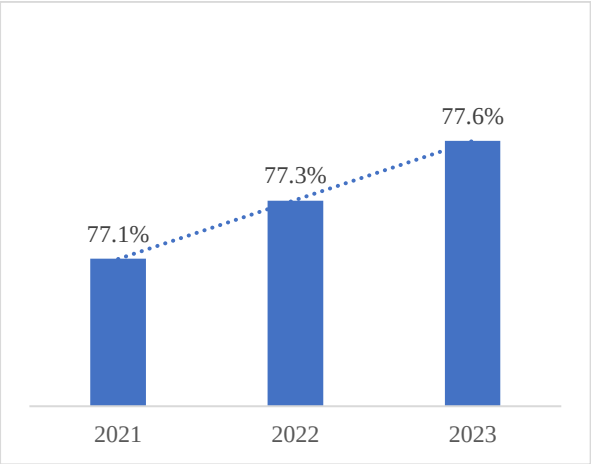


Source: Own work based on Mercedes-Benz Group (2024a), Mercedes-Benz Group (2023a), Mercedes-Benz Group (2022).

The business segment dominating company's revenue source is the Car segment, making around 74% of the total revenue in 2023 from the initial 72% from 2021, followed by the Vans business stream which increased from 11% to 13% in 2023 and lastly the Mobility part of the business which decreased its share from 17% in 2021 to 13% in 2023.

Following the increase of revenue, COGS has the same trend, with its share in revenue increasing incrementally YoY to 77.6% in 2023 (Figure 3), meaning it grew slightly faster than revenue in the previous years.

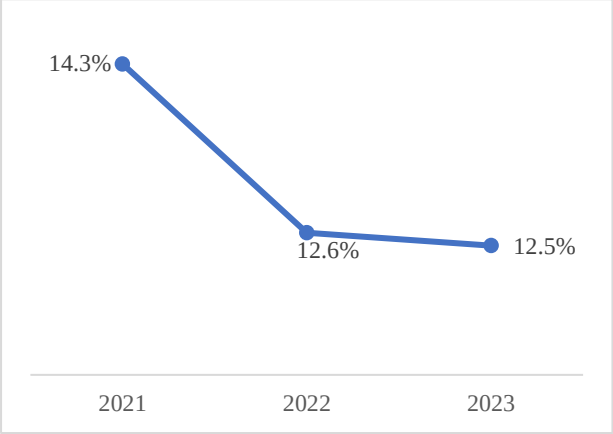
Figure 3: COGS share in Total Revenue (2021-2023)



Source: Own work based on Mercedes-Benz Group (2024a), Mercedes-Benz Group (2023a), Mercedes-Benz Group (2022).

OPEX remained stable through 2021 – 2023 but as the revenue grew by more than 10pp YoY, as the opposite effect, the OPEX % of revenue (Figure 4) fell by roughly 1.7pp from 2021 to 2022 and stabilized in 2023 on 12.5% out of total revenue. This as a result is pointing to high operating efficiency.

Figure 4: OPEX % of Revenue (2021-2023)

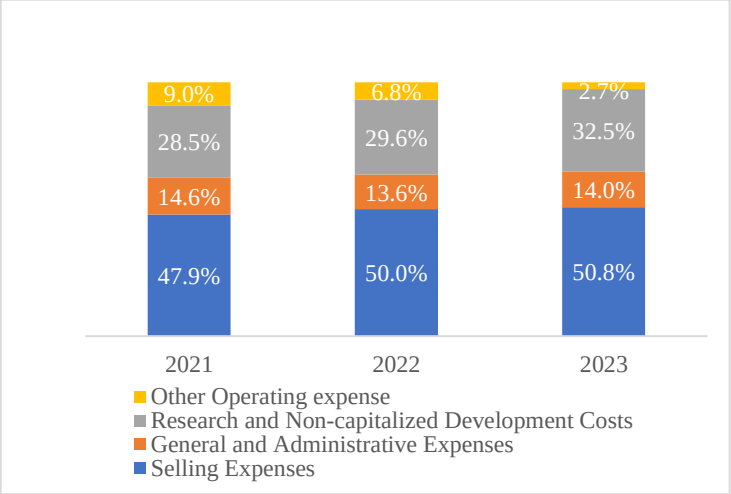


Source: Own work based on Mercedes-Benz Group (2024a), Mercedes-Benz Group (2023a), Mercedes-Benz Group (2022).

The necessity to examine the structure of OPEX and to acknowledge the dynamics of different account groups is an imperative for understanding the direction in which the company is going to. Figure 5 portraits significant changes in the way company is operating with its cost over time. Higher % of R&D and Selling expenses within the

structure and the lowering of Other OPEX indicate company's ambitions and preparation for the future.

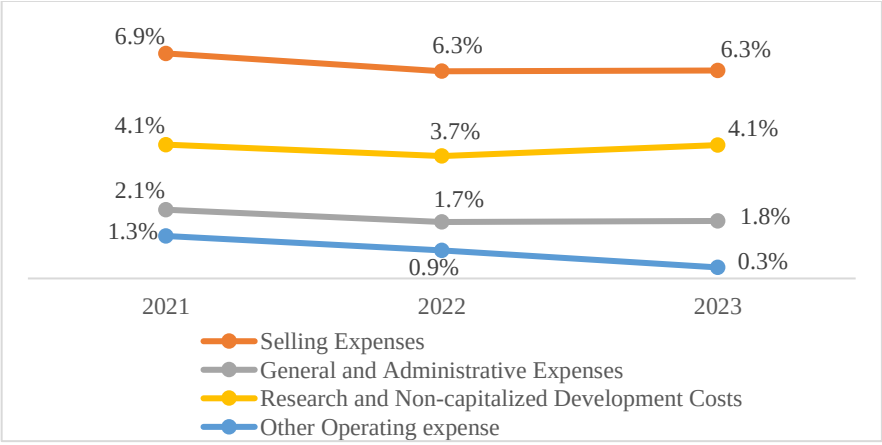
Figure 5: OPEX Structure (2021-2023)



Source: Own work based on Mercedes-Benz Group (2024a), Mercedes-Benz Group (2023a), Mercedes-Benz Group (2022).

When looking at each cost group separately in comparison to the revenue, we can notice that each group moves in a steady trend, without big fluctuations as shown in the Figure 6.

Figure 6: Different cost categories in terms of % of Revenue (2021-2023)

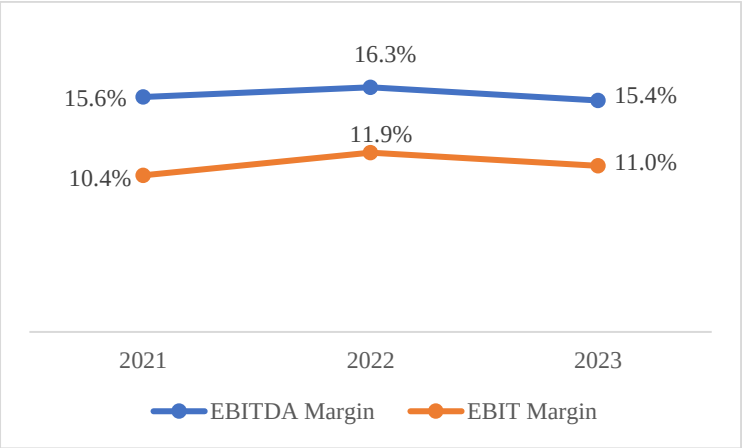


Source: Own work based on Mercedes-Benz Group (2024a), Mercedes-Benz Group (2023a), Mercedes-Benz Group (2022).

After analysing Revenue, COGS and OPEX we approach the Earnings Before Interest and Tax (hereafter: EBIT) and Earnings Before Interest, Tax, Depreciation and Amortization (hereafter: EBITDA) lines which are crucial for understanding if the company is operating in a healthy and prosperous way. In overall terms, company's key metrics are improving versus the COVID pandemic era. EBIT increased significantly

from 2021 to 2022 by staggering 28.3% which made the EBIT Margin jump by 1.5pp YoY given the high increase in revenue, reaching 11.9% before lowering to a level of 11.0% in 2023.

Figure 7: EBIT & EBITDA Margins (2021-2023)

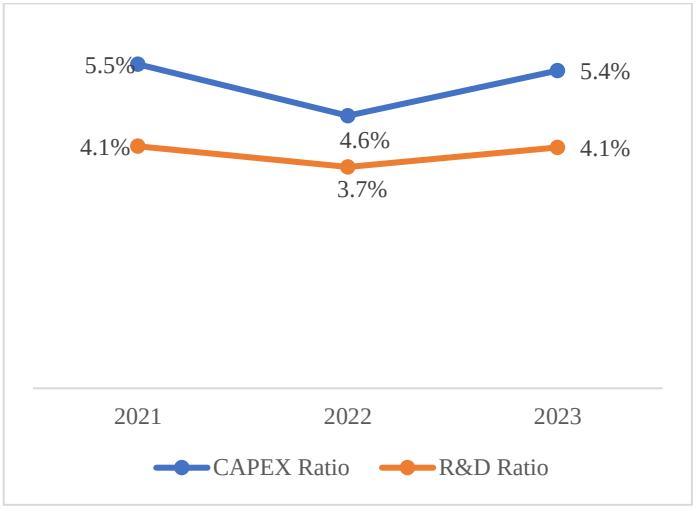


Source: Own work based on Mercedes-Benz Group (2024a), Mercedes-Benz Group (2023a), Mercedes-Benz Group (2022).

When speaking about EBITDA, the movement trend through time is very similar to the one of EBIT but with the difference of Depreciation and Amortization (hereafter D&A) movement. From 2021 to 2022 the increase from 15.6% to 16.3% is mainly driven by unproportionate increase in revenue in comparison to relatively flat OPEX, this made EBITDA increase YoY by 16.7% while dropping the following year by 0.9pp from the margin perspective to 15.4% of total revenue (Figure 7).

CAPEX and R&D are significant indicators of company's approach to the future. Decrease in ratios during 2022 (Figure 8), are mainly driven by an unproportionate increase of total revenue in comparison to CAPEX and Non-Capitalized R&D investments. Non-Capitalized R&D remained on a similar level as the year before (2.5% increase versus 2021) as for CAPEX, company more severely decreased the amount dedicated to this expense line (approximately 5.8% less than in 2021). This was due to several crucial cost cutting and cost targeting decisions company made, influenced by macroeconomic uncertainties like COVID pandemic, newly escalated war in Ukraine but also shortage of semiconductors and prioritisation of investments towards more High-End vehicle production (Mercedes-Benz Group, 2023a). The ratios had a slight rebound in the year after, with 0.4pp increase of R&D ratio and 0.8pp adjustment of CAPEX ratio (Figure 8).

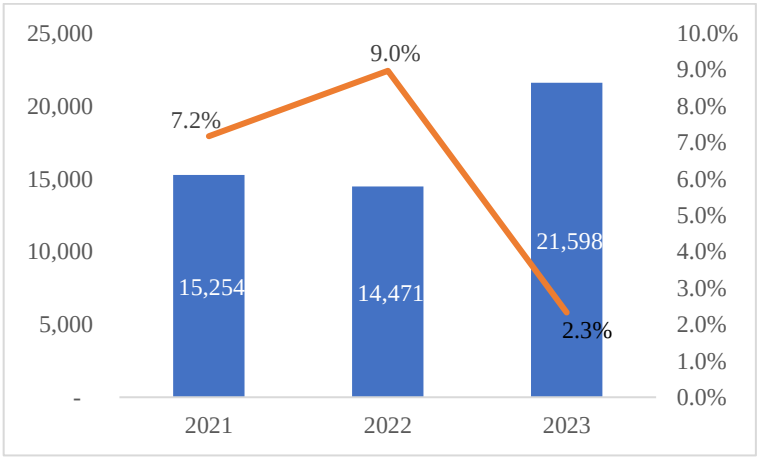
Figure 8: CAPEX and R&D Ratios relative to Revenue (2021-2023)



Source: Own work based on Mercedes-Benz Group (2024a), Mercedes-Benz Group (2023a), Mercedes-Benz Group (2022).

Considering the trend presented in the Figure 9, the sudden plunge in FCF out of total revenue %, is easily noticeable. The source of this drop is primarily because of an increase in Net Working Capital (hereafter: NWC) on 31.12.2023, impacted by higher leasing and receivables relating to sales-financing from Mercedes-Benz Mobility business segment, compared to the previous year, combined with the inventory increase. Drivers of inventory buildup are the introduction of the direct sales model in additional markets and ramp-ups in production due to new model years. Additionally, the finished goods include, on average, more expensive vehicles (Mercedes-Benz Group, 2024a).

Figure 9: FCF Margin and NWC (2021-2023)

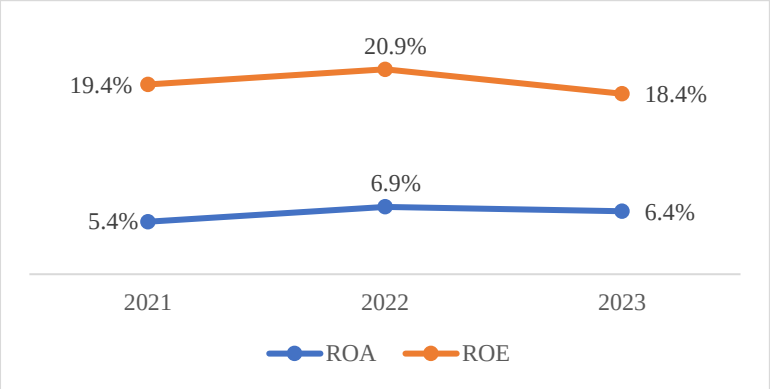


Source: Own work based on Mercedes-Benz Group (2024a), Mercedes-Benz Group (2023a), Mercedes-Benz Group (2022).

The company improved its efficiency in using assets to generate revenue in 2022 but saw a modest dip in 2023. This is due to an increase in total asset base without a proportional rise in EBIT generation, causing a drop of 0.5pp YoY in Return on Assets (hereafter:

ROA) (Figure 10). Return on Equity (hereafter: ROE) followed a similar pattern as ROA except having more pronounced changes. The 2022 peak indicates strong operational performance relative to shareholder equity level. The 2023 decline is reflected with, not that big of an increase of EBIT, as the situation was with total equity increase (from 85.4 billion EUR in 2022 to 91.8 billion EUR in 2023 of total equity)

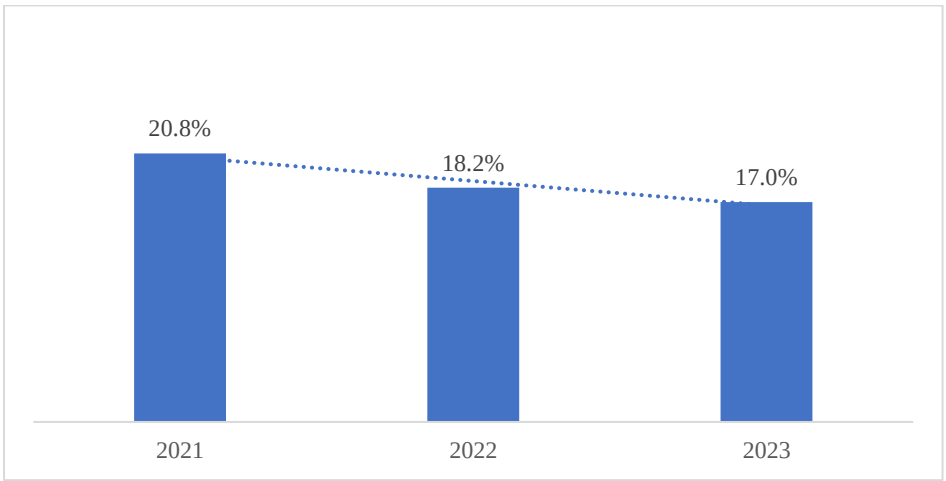
Figure 10: ROA and ROE (2021-2023)



Source: Own work based on Mercedes-Benz Group (2024a), Mercedes-Benz Group (2023a), Mercedes-Benz Group (2022).

Combination of growing revenue and decreasing fixed assets is depicted with the Figure 11, indicating a declining trend throughout time as the company improves its capital efficiency, requiring less assets for driving revenue growth.

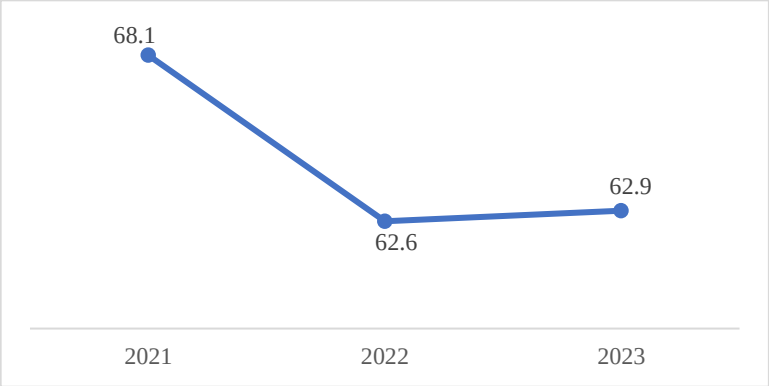
Figure 11: Fixed Assets % of Revenue (2021-2023)



Source: Own work based on Mercedes-Benz Group (2024a), Mercedes-Benz Group (2023a), Mercedes-Benz Group (2022).

At the end we look at the performance Mercedes Benz Group share had in the prior three years considering the price on the last day of the year. Price saw a drop of 8.1% YoY in 2022, before stabilizing on the price level of 62.6 EUR per share at the end of 2022, and 62.9 EUR per share in 2023 as presented in the Figure 12.

Figure 12: Share price movement of Mercedes Benz Group (2021-2023)



Source: Own Work based on S&P Global (n.d).

3.5 Valuation approach and method

Method of valuation being used, as well as calculations done, are the fundamental parts of every model. For the purpose of valuating the company of such size and complexity as Mercedes Benz Group, we find most applicable Discounted Cash Flow (hereafter: DCF) method of valuation.

DCF model estimates the present value (hereafter: PV) of the asset being looked at, in our case Mercedes Benz Group, based on the discounted value of all the future expected cash flows that the asset generates for its owner. There are two principal methodologies when it comes to discounting cash flows, the Free Cash Flow to the Firm (hereafter: FCFF) and the Free Cash Flow to Equity (hereafter: FCFE) approaches (Damodaran, n.d.). In the case of Mercedes Benz Group presented in the thesis, FCFF is being introduced as a more general and often used in practice model. We derived the process into three separate segments which are described in the following sub-chapters, thus bringing to light specificities of the model and the way its mechanism works.

3.5.1 Estimation of Free Cash Flows

Following the first out of three segments of the model, it is crucial to show the financial flow from the top line, in this case EBIT line, over Net Operating Profit Less Adjusted Taxes (hereafter: NOPLAT), Net CAPEX and NWC to the bottom or to FCF, based on which we get to the PV of the company (Damodaran, n.d.).

Each item has its unique way of calculating and is made up of the previous one or more lines. To better understand what every component of the model contains within, in the next paragraphs we in detail describe how the numbers are being used for different calculations and what is their role in the whole process.

3.5.1.1 EBIT

Looking at the financial statements of the company, we put a special highlight on the Income Statement (hereafter: IS). EBIT is a key parameter of the IS, defined quite simply as Revenue net of COGS and OPEX before interest and taxes being paid as the name suggests.

Revenue – a product of quantity sold and price set by the company. The model calculates this line as a summation of revenues from all of the company's business segments: Cars segment revenue (hereafter: Rev.c), Vans segment revenue (hereafter: Rev.v) and Mobility segment revenue (hereafter: Rev.m);

$$Revenue = Rev.c + Rev.v + Rev.m \quad (1)$$

$$Rev.c = Qc_{EV} * Pc_{EV} + Qc_{ICE} * Pc_{ICE} \quad (2)$$

$$Rev.v = Qv_{EV} * Pv_{EV} + Qv_{ICE} * Pv_{ICE}. \quad (3)$$

Some of the symbols used in the formulas going forward: y represents the current year, y-1 resembles a year before, y-2 presents a year two years ago and so on, while Qc resembles quantity of cars sold differentiating between EV and ICE, also Pc is referring to the price of the car being sold either EV or ICE. Similar to cars we have as well for vans, Qv and Pv.

Rev.m in the forecasted years is based on a % rate out of revenue of the industrial part of the business (Cars & Vans segments) (hereafter: Rev.i) as shown in (4):

$$Rev.m = x * (Rev.c + Rev.v) \quad (4)$$

where

$$x = \frac{(Rev.m\ (y-1)/Rev.i\ (y-1)) + (Rev.m\ (y-2)/Rev.i\ (y-2))}{2}. \quad (5)$$

COGS – Biggest expense segment of the model. It represents costs that are in direct relation to production of the vehicles that the company has sold. Main thing separating it from OPEX is the fact that OPEX are not specifically linked to the production, but moreover they consist of expenses such are Sales and Marketing, Legal services, Rents, Utilities etc., which are enabling the business to function properly on everyday basis (FERNANDO, 2024).

The Model takes two-year average COGS and assumes it as relevant for the following year (6);

$$COGS'24 = \frac{(COGS'23 + COGS'22)}{2}. \quad (6)$$

OPEX – last piece of the puzzle before landing on EBIT, they consist of: Selling expenses, General and Administrative expenses, R&D costs and Other OPEX. Each expense line mentioned is calculated for each forecasted year based on a two-to-three year average (depending on the expense) proportion of total revenue, multiplied with the forecasting year total revenue.

3.5.1.2 NOPLAT

Parameter that shows company's operating profit after the adjustment for tax, as such NOPLAT serves as a good indicator of operations health (Kenton, 2019). Valuation model computes NOPLAT in the way presented by the formula (7), emphasizing that Effective tax rate for the forecasted years is calculated as a three-year average of Tax rates from previous years, which keeps the rate stable;

$$NOPLAT = EBIT * (1 - Effective\ tax\ rate). \quad (7)$$

3.5.1.3 Net CAPEX

Net CAPEX is the line within the model dedicated to explaining what the actual cash outflow is due to CAPEX. This is the reason why we exclude D&A out of the total CAPEX, as it does not include cash transaction of any kind;

$$Net\ CAPEX = CAPEX - D\&A. \quad (8)$$

CAPEX is being looked at as a bundle of Purchase of Property Plant & Equipment (hereafter: PP&E) line and Additions to Intangible assets line within the Cash Flow statement. Mercedes-Benz Group capitalizes development costs as intangible assets. When these costs are recognized on the balance sheet, they appear under 'Additions to Intangible Assets' because they increase the carrying amount of internally generated intangible assets, rather than being expensed in the entire amount. In its purest form, CAPEX is equal to a change in PP&E and Intangible assets YoY with addition of D&A of the current year.

Regarding D&A, general formula (9) used for its determination consists of two parameters:

1. PP&E/Intangible assets and
2. Average Useful life of PP&E/Intangible Assets;

$$D\&A = \frac{Asset}{Average\ Useful\ Life\ of\ an\ Asset}. \quad (9)$$

The Average Useful life of an Asset (PP&E or Intangibles), for the past years, is calculated as a relative measure of the Asset line within the Balance Sheet (hereafter: BS) and D&A line within the CFS;

$$Average\ Useful\ Life\ of\ an\ Asset = \frac{Asset}{D\&A}. \quad (10)$$

Forecast of future years' Average useful Life of an Asset is defined with the formula (11), with the purpose of continuance of the trend from the previous period;

$$Average\ Useful\ Life\ forecasted = \frac{Asset\ (y-3)+Asset\ (y-2)+Asset\ (y-1)}{D\&A\ (y-3)+D\&A\ (y-2)+D\&A\ (y-1)}. \quad (11)$$

PP&E is a key component of estimating Net CAPEX and with this comes a certain complexity in forecasting it in the future years. Based on the calculated CAPEX, alongside previous year's PP&E and estimated Average Useful Life of PP&E for the forecast year, PP&E is extrapolated. The same applies for estimating Intangible assets.

3.5.1.4 Change in NWC

For this section of the model focus is, as the naming suggests, on the NWC;

$$NWC = \text{Current Assets} - \text{Current Liabilities} \quad (12)$$

$$\text{Change in } NWC = \text{NWC y} - \text{NWC(y} - 1). \quad (13)$$

Forecasted years are dependent on previous years' proportion of NWC to Total Revenue, as they are calculated as presented in the formula (14), maintaining a stable trend in comparison to Total Revenue throughout time;

$$NWC\ y\ forecasted = \frac{NWC\ (y-3)+NWC\ (y-2)+NWC\ (y-1)}{Revenue\ (y-3)+Revenue\ (y-2)+Revenue\ (y-1)} * Revenue\ y. \quad (14)$$

3.5.1.5 FCF

When all of the Working capital and CAPEX requirements have been settled, what is left of company's operating cash flow, represents what the company can distribute further, either to its investors or to reinvest back by expanding current or developing new business operations, also known as FCF.

As mentioned in the beginning of the chapter, model calculates FCF to the Firm, considering different stakeholders and valuing their total stake in the company. With this in mind the way that model arrives to FCF is as shown in formula (15);

$$FCF = NOPLAT - Net\ CAPEX - Change\ in\ NWC\ . \quad (15)$$

3.5.2 Estimation of WACC

WACC quantifies company's cost of capital across all financing sources, including equity (both common and preferred) and debt, adjusted for tax effects. It reflects the minimum return that a company must generate on its asset base to satisfy its investors, weighted by the proportional contribution of each capital component to the overall capital structure (Hargrave, 2024).

WACC consists of several different variables when it is being estimated. Cost of Equity (Re), Pre-tax cost of Debt (Rd), Tax rate (T), Market capitalisation or Market value of Equity (E) and Book value of Debt (D) are the main factors influencing the estimation (Hargrave, 2024);

$$WACC = Re * \frac{E}{(E+D)} + Rd * \frac{D}{(E+D)} * (1 - T). \quad (16)$$

Equity value is calculated as a product of Share price at the end of 2023 and shares outstanding on that same date.

Cost of Equity is determined with the CAPM. The model explains the link between systematic risk and associated expected return of investing in a specific asset, in our case in Mercedes Benz company. It is defined by the relationship of risk-free rate (rf), levered beta coefficient (β) and Equity Risk premium rate (ERP) which is calculated as a difference between market expected return (rm) and rf (Kenton, 2024);

$$Re = rf + \beta * (rm - rf). \quad (17)$$

Pre-tax cost of debt on the other hand is being computed using the methodology of Damodaran called Synthetic Ratings approach, in addition to risk free rate and country default spread (18);

$$Rd = rf + country\ default\ spread + company's\ synthetic\ rate\ spread. \quad (18)$$

Synthetic rating of the company, based on which the specific synthetic rate spread is applied, is determined by financial metric called Interest coverage ratio (hereafter: ICR). In its simplified form, it serves as a proxy for creditworthiness of the company (Damodaran, 2021);

$$ICR = \frac{EBIT}{Interest\ Expense}. \quad (19)$$

Empirical data from rated firms were used to map specific ranges of ICRs to synthetic credit ratings by Damodaran, which we then based on the ratio outcome, use as applicable in our estimates of pre-tax cost of debt of the company being valued.

3.5.3 Calculation of Value

Final step of the Valuation process is to combine everything established in the previous steps and get the overall picture of company's expected financial performance in the future, manifested through one number – Estimated stock price. But before arriving to the Stock price, there are some key elements needed to be defined as a prerequisite.

Initial element is Enterprise Value (V). To calculate it, we sum up the present values of each year's cash flow (CF) generated during the expected growth period. After this phase, instead of continuing detailed forecasts into infinity, we discount the value of all future CFs beyond selected specific point in time to get to a single figure known as the Terminal value (TV) as presented in the formulas (20)(21). The g stands for Termina Value growth rate, expected to occur after the last year of forecast, and WACC is used as the discount rate for FCF discounting back to the valuation date;

$$V = \sum_{t=1}^{N} \frac{CFt}{(1+WACC)^t} + \frac{TV}{(1+WACC)^N} \tag{20}$$

$$TV = \frac{CFt+1}{(\mathrm{WACC}-\mathrm{g})}\,. \tag{21}$$

Second step towards the Stock price projection, is the estimation of Equity value (Ev) of the company. We do so by subtracting the book value of debt (D) from the Enterprise value;

$$Ev = \mathrm{V} - \mathrm{D}. \tag{22}$$

The final step is dividing the Equity value with the number of shares outstanding, and we get to the Estimated share price;

$$Estimated\ Share\ price = \frac{Ev}{Outstanding\ share}\,. \tag{23}$$

3.6 Valuation scenarios – Overview and assumptions

In this section of the thesis, we present the assumptions behind each scenario, emphasizing important assumptions, defining them and the reasoning for their implementation in the valuation. There are two different scenarios being introduced in addition to the base-case based on the company's strategy:

1) Assuming alternative product mix as a first scenario and,
2) Assuming alternative production process as the second one.

3.6.1 Base case

Representing a neutral, fundamentals-driven valuation of the company, the Base case serves as the analytical anchor in our scenario framework. It reflects a traditional DCF approach to valuation, grounded in the company's current operational performance, market conditions, and management strategy.

Assumptions that enrich this base case, giving it a unique value, are presented within groups. The forecast period is from 2024 to 2028, after which we consider the Stable growth period.

FCF related assumptions:

1. Revenue:

a. Pricing assumption – Weighted average price increase of vehicles YoY, remains stable throughout the growth period, equalling ECB's five year forecasted inflation rate of 2.1% (European Central Bank, 2022).

b. Quantity assumptions:
   Total Market (TM) – represents a total of industry's sold vehicles worldwide and the five-year period volumes are projected based on a three-year Compound average growth rate (hereafter: CAGR) with each year's TM calculated separately. In 2024 growth was estimated at 4.5% YoY while in 2025 it rose up to 5.1% YoY. After that point growth in TM starts to deteriorate, following a 3.2% growth versus PY in 2026, 2.8% YoY in 2027 and finally a 2.0% growth in 2028 (OICA, 2023). Furthermore, the split within Industrial segment has been assumed, on ICE and EVs. Total Electric vehicle market has been obtained from the IEA data base for the PYs (IEA, 2024) and extrapolated for future years based on the shares within the total vehicle market from PYs. This is done by adding the average YoY % change of share total EV market has out of the total vehicle market from the past two years (y-2 & y-3) to the latest year's (y-1) EV total market share.

Company's volumes – depending on the business segment we assumed the following:

Car segment – Sharp decrease in the first years in volume which had a negative impact on company's Share of Market (hereafter: SoM), due to increased competition. Decrease of 3.5% YoY in 2024 in volumes (-0.2pp YoY in combined SoM); in 2025 we assumed a 2.5% decrease versus PY's volumes implying a -0.2pp in Combined SoM. Over time expected stabilisation in market position with the average Combined SoM of 2.5%. EVs' share within the company's car portfolio assumed to increase over the forecasting period in the same manner as it is assumed for the EVs' share within the TM. In 2024, share of EVs increased by 4.8pp in comparison to PY, in 2025 it was a 4.1pp increase while for the remaining period it had an average 4.4pp increase YoY, reaching a total of 41.8% within the car segment in 2028.

Van segment – as well a sharp decline in volume and share, due to increased competition. Decrease of 5.0% YoY in 2024 in volumes (-0.1pp YoY in combined SoM); in 2025 we assumed a 4.0% decrease versus PY's volumes implying a -0.1pp in Combined SoM, however market position assumed to stabilize throughout time to an average Combined SoM of 0.5%. As for the EVs' share within the van segment, same assumption follows as for the car segment, peaking in 2028 with a total share in the segment of 39.2%.

2. COGS - Stable trend throughout the looked at period, taking up 80.4% of total Revenue in 2024, with the peak being in 2025 with 82.2% of total Revenue, and falling back to a level of 80.7% by 2028.
3. OPEX – Stable trend in proportion to the Revenue throughout the specified time frame, averaging a level of 12.4% in the years building up to and including 2028. When it comes to R&D cost, we assume a capitalization rate of 40% based on the historical practice. Non-Capitalized R&D remained stable throughout the forecasting period with a level of 4.2% out of Total Revenue.
4. CAPEX – Two drivers being forecasted are Purchases of PP&E and Additions to Intangible Assets. For the company to steadily implement new production lines relating to EVs and the goal for 2030, we forecasted that by 2030, % of Revenue going towards PP&E investments, needs to be at least 5%. This % is assumed based on competition research, with the focus on fully electric companies like Tesla and BYD which have significant amounts of their Revenue invested in PP&E, in particularly Tesla with 9.2% (Tesla, 2023). As the company plans to have by 2030, 50% of its Revenue coming from EVs, we assumed that 5% is reasonable in comparison to fully EV oriented companies. To reach this goal an equal 0.35pp YoY increase is expected starting 2024, so that by 2028 it rounds to 4.3% of Revenue. When talking about Additions to Intangibles, we assumed a flat 3% of Revenue contributed to these types of investments throughout the whole period, out of which approximately 84.3% is for R&D which is being capitalized, and the rest is dedicated to other types of Intangible assets. This split in investment in Intangibles comes from the actual split in the year 2023, from which we kept the proportion in the entire forecasting period.
5. NWC – In 2024 it was 11.7% of Revenue which represents a 3-year average %, while we assumed a flat rate of 11.8% until 2028.

WACC and TV related assumptions:

For the purpose of WACC estimation based on the formula (16), we assume our rf and ERP for the Eurozone (Germany) on Kroll's estimates, based on 15-year German government bond yield as the proxy for risk-free return and predominant economic and market conditions within the Eurozone, with the riskless rate standing at 3% and recommended ERP in between 5.5% and 6.0%. The model uses the recommended rf of 3% and 6.0% for ERP (Kroll, 2024). Synthetic risk rate of the company, we assume to be

0.75%, based on calculated ICR which indicated a triple A synthetic rating (Damodaran, 2021).

Levered beta coefficient used to calculate WACC in (16), we assumed to be aligned to the one presented in Capital IQ Pro platform for the date 31.12.2023 as a three-year beta and stands at 1.2. (S&P Global, n.d.). Calculated discount rate or WACC is being used as a constant through years being forecasted.

In order to calculate TV, we apply a constant growth rate to infinity of 1.3% in (21). This rate is chosen based on the Deutsche Bundesbank monthly report from December 2023 (Deutsche Bundesbank Eurosystem, 2023), and it resembles the projected GDP growth rate of Germany in which Mercedes Benz Group resides.

3.6.2 First scenario – ESG enhancement impact on Production Mix

The following scenario tends to explain how the value of the company reacts to a more drastic approach to electrification of vehicle portfolio, by reaching a mark of 50% of revenue coming from electric vehicles in an earlier date (end of year 2028) than 2030 year, initially stated by the management (Mercedes-Benz Vans, 2023). This would be followed by a more intensive investment strategy to be able to successfully deploy the needed upgrades of production and product development.

Assumptions made for the purpose of modelling the scenario:

FCF related assumptions:

1. Revenue:

a. Pricing assumptions:

Difference in pricing of ICE and EVs – In 2024 the average relative price difference between the ICE models and their EV counter parts we assumed to be 10 thousand EUR, based on the price list available on the company's websites and other complementary sources (Mercedes-Benz USA, 2023). The difference deteriorates as the time passes, conditioned by the expected price parity between two types of engine models within a specified time period. The difference is assumed to decrease in an equal amount of 909 EUR each year until the equation in price materializes, which is expected to be as of the year 2035 (KPMG International, 2023).

Average vehicle price – for both Cars and Vans the price change YoY is equal. In the first two years, change is assumed to be positive 2.1% (equal to the expected inflation rate) after which the increase becomes more significant (in 2026 was assumed 5% increase, in 2027 was 8% and in 2028 was 7% increase) as the company starts to price in the higher level of luxury EVs within its portfolio as well as higher ICE prices overall (KPMG International, 2023). The weighted average car price of Mercedes Benz in 2024 is assumed to be 56,320 EUR, while the weighted average van price is

46,257 EUR. In 2028 cars are at the weighted average price point of 69,773 EUR while van models are at the level of 57,306 EUR.

b. Quantity assumptions:
   TM - remained the same as for the Base case.
   Company's volumes:
   Car segment: Total cars sold declines sharply in the first two years (as per the Base scenario) and continues a declining trend throughout the period as the firm enters more heavily the EV market in which the competition is highly specialized (next year's volume forecast is based on the addition of average absolute YoY change from prior two years (y-3 & y-2) to the latest year's (y-1) volume, with an additional decrease of 30 thousand vehicles in years 2027 and 2028 each). EV volumes are assumed to have a positive trend, increasing share within the portfolio each year exponentially (PY's YoY % change of share in the car portfolio, plus 1pp) so that by 2028 they make up 50% of the car portfolio. In 2024 the EV share within the car portfolio grew by 4.3pp YoY, followed by a 5.2pp YoY growth in 2025, totalling 29.2% of the car portfolio. In the years 2026, 2027 and 2028 the YoY growth rates are assumed to be respectively 6.2pp, 7.2pp and 8.1pp.
   Van segment: Same as per the Base scenario for the initial two years of forecast and declining throughout time with additional pressure coming from competitors within the growing EV market (estimating next year's volume, we start with the latest actual figure and adjust it using the average yearly growth observed over the past two years. For 2027 and 2028, the forecast includes a planned cut of additional 20 and 30 thousand units respectively to reflect anticipated market shifts). Further assumption is that the share of electrified Vans in the van portfolio increases to more than 20% by 2026 and to more than 50% by 2028 (Mercedes-Benz Vans, 2023).

2. COGS - Stable trend kept throughout time, making up 80.4% of the total Revenue in 2024, while reaching the maximum in 2025 with 82.2% of total Revenue, and establishing at the level of 81.9% by 2028.
3. OPEX - There are no differences in assumptions in comparison to the Base case.
4. CAPEX - We kept the same assumptions for Additions to Intangible assets as in the Base case. For Purchases of PP&E, as the scenario predicts reaching the 50% Revenue from EVs mark in 2028, we assume that they would make up to 5% of Revenue by 2028. To achieve this ambitious goal, it is necessary to increase the % share in Revenue by 0.51pp YoY, building up to 5.0% of Revenue dedicated to new PP&E in 2028.
5. NWC – Same assumptions as in the Base case.

WACC and TV related assumptions:

For the 1st scenario we assume different discount rates (WACC) for each year. This assumption is mainly driven by the fact that the product mix is changing rapidly and that

with this considered, the cost of capital is prone to change over time. Assumption set is that the impact on WACC should not exceed the threshold of +/- 1pp as it could significantly impact the valuation result (Glavas, 2023). Beta coefficient is the factor influencing the change and we are projecting it for each year based on the linear regression done, taking into account a group of five peer companies comprised of BMW, Volkswagen AG, Stellantis, General Motors Company and Hyundai Motor Company, together with Mercedes Benz Group and their product mix, as well as their three-year levered betas sourced from the Capital IQ Pro platform which we firstly un-lever, before re-levering them back with Mercedes' Debt to Equity ratio, making them comparable to its beta coefficient. This is all under the assumption that firm's systematic risk is influenced by its strategic orientation toward EVs. Calculations are presented within the 3.7.2 chapter of the thesis. As an additional assumption, newly estimated beta coefficient of Mercedes Benz Group, based on the beforementioned methodology, is capped to the level of re-levered beta calculated for competitor General Motors Company which stands at 0.86. This is assumed as it reflects a reasonable range within which beta of the valuated company is expected to maneuver in, without underestimating the cost of capital and ensuring valuation comparability. Relating to the Risk-free rate, ERP rate and TV growth rate, we assumed the same as for the Base scenario.

3.6.3 Second scenario – ESG enhancement impact on Cost

The objective of the final scenario is to demonstrate how increasing sustainability-related costs and strategic upgrades to existing operations can influence the company's overall valuation. It focuses on the impact of reinvesting in current production infrastructure to enhance efficiency and promote more sustainable vehicle manufacturing practices. By doing so, the company can reduce long-term operational costs, improve environmental performance, and align more closely with emerging industry standards.

The scenario outlines an alternative strategic pathway that the company could pursue to remain resilient amid intensifying regulatory requirements, shifting sustainability expectations, and evolving market demands. It assumes a commitment to higher CAPEX and increased R&D investments, aimed at transforming traditional automotive operations into a more future-ready and responsible business model. The scenario serves to highlight how proactive investment in sustainability and innovation can become a key driver of long-term value creation. Related assumptions made for the purpose of presenting this specific perspective on sustainability are shown in the following.

FCF related assumptions:

1. Revenue - both Pricing and Quantity assumptions remain aligned with the Base scenario assumptions.
2. We assume that the initial shift toward EVs led to a temporary increase in COGS, driven by higher battery costs, platform redesigns, and new manufacturing setups.

This impact peaked in 2025, with COGS reaching 82.2% of revenue. However, based on economic theory (Schoenmaker & Schramade, 2023) and knowledge accumulation through R&D theory (Spence, 1984) we forecast that high strategic investments in R&D and CAPEX will gradually restore cost efficiency starting from 2026. Accordingly, we expect COGS to decline to 77.7% of revenue by 2028, returning to levels observed prior to the EV-intensive period.

3. OPEX – Expected to steadily evolve in proportion to revenue, with 0.2pp YoY increase throughout the forecasted period, taking up to 13.5% of revenue by 2028. This is mainly driven by the expansion of non-capitalized R&D which contributed with the growth of 3% versus PY in 2024, followed by a steep increase in the years 2025 and 2026 of respectively 4.3% and 6.5%. In 2027 and finally 2028 the % change of non-capitalized R&D was a positive 4.6% and 4.9% respectively totaling 5.4% of revenue.
4. CAPEX – The assumption is that with heavier investments in both PP&E and Intangibles, combined with the non-capitalized R&D, company will reach a level of 15% of its revenue being invested in the progression towards a more sustainable production of current ICE vehicles and changed portfolio mix by year 2028. This particular % was forecasted as an anchor of competitiveness with the more EV oriented rival companies, investing between 13.3% (Tesla) and 27.2% (BYD) of their revenue in sustainability driven initiatives like CAPEX and R&D (Tesla, 2023). When looking at the purchase of PP&E, it has been increased by 0.6pp on average YoY until 2028, reaching a level of 5.6% of revenue generated. On the other hand, additions to Intangibles were more conservative, with growing share in proportion to revenue on average 0.2pp YoY, amounting to 3.9% of total revenue in 2028.
5. NWC - Same assumptions as in the Base case.

WACC and TV related assumptions: All relevant assumptions are in line with the Base scenario.

3.7 Valuation – Calculations and Results

Going into the chapter that presents the outcome of each scenario and the calculations behind them, we are completing the valuation picture based on which the conclusion is being drawn.

3.7.1 Base case

We begin by presenting the calculations and results of the Base case. This serves as the primary reference point against which all alternative scenarios will be compared. By establishing it first, we ensure clarity and consistency when comparing the impact of different assumptions on the company’s financial outlook.

3.7.1.1 Estimation of Free Cash Flows

Table 1: Income statement - Base case. (2020 - 2028)

Income Statement (in bio EUR)	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**
Revenues	121.8	133.9	150.0	153.2	146.1	143.7	145.3	145.1	146.0
COGS	(101.6)	(103.2)	(116.0)	(118.8)	(117.4)	(118.1)	(117.8)	(118.0)	(117.9)
Selling Expenses	(9.0)	(9.2)	(9.5)	(9.7)	(9.5)	(9.2)	(9.3)	(9.3)	(9.4)
G&A Expenses	(2.5)	(2.8)	(2.6)	(2.7)	(2.5)	(2.5)	(2.5)	(2.5)	(2.5)
Non-Capitalized R&D	(4.8)	(5.5)	(5.6)	(6.2)	(6.1)	(6.0)	(6.1)	(6.1)	(6.1)
Other Operating inc/exp	1.3	0.7	1.5	1.2	1.2	1.2	1.2	1.2	1.2
EBIT	5.2	13.9	17.9	16.9	11.7	9.0	10.8	10.4	11.3

Source: Own work based on Mercedes-Benz Group (2024a), Mercedes-Benz Group (2023a), Mercedes-Benz Group (2022).

EBIT drop that can be seen from 2023 to 2024 (Table 1), as the initial year of forecast, is mainly driven by the Revenue decrease caused by the drop in volume assumed. Expense lines including Selling expenses, G&A and Other operating ones are estimated to be in a 3-year average proportion of revenue in the forecasting years, following the movement of revenue.

Table 2: Volume evolution - Base case. (2020 - 2028)

Volume (in mio units)	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**
Total Market (all passenger cars sold)	54.7	57.3	58.6	65.3	68.2	71.7	74.0	76.0	77.5
Cars	2.09	1.94	2.04	2.04	1.97	1.92	1.92	1.90	1.89
ICE	n/a	1.67	1.71	1.64	1.49	1.37	1.29	1.19	1.10
EV	n/a	0.27	0.33	0.40	0.48	0.55	0.64	0.71	0.79
Vans	0.37	0.39	0.42	0.45	0.43	0.41	0.41	0.40	0.40
ICE	n/a	0.37	0.40	0.43	0.38	0.35	0.33	0.31	0.29
EV	n/a	0.01	0.02	0.02	0.04	0.06	0.08	0.09	0.11
Total units sold	2.46	2.33	2.46	2.49	2.40	2.33	2.33	2.30	2.28
EVs in the product portfolio	n/a	12.3%	14.2%	17.0%	21.9%	26.0%	30.5%	34.8%	39.2%
SoM combined	4.5%	4.1%	4.2%	3.8%	3.5%	3.3%	3.2%	3.0%	2.9%
Cars share	3.8%	3.4%	3.5%	3.1%	2.9%	2.7%	2.6%	2.5%	2.4%
Vans share	0.7%	0.7%	0.7%	0.7%	0.6%	0.6%	0.6%	0.5%	0.5%

Source: Own work based on Mercedes-Benz Group (2024a), Mercedes-Benz Group (2023a), Mercedes-Benz Group (2022).

Volume shrank in both Cars and Vans segment YoY till 2026, when the share started to stabilize, with Vans segment SoM being at the level of 0.5% and Cars at 2.4% at the year 2028 (Table 2).

Table 3: Average Vehicle price evolution - Base case. (2020 - 2028)

Average Vehicle prices (EUR per unit)	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**
Cars	n/a	49,752	54,688	55,162	56,320	57,503	58,710	59,943	61,202
ICE	n/a	n/a	n/a	n/a	53,872	54,902	56,004	57,225	58,545
EV	n/a	n/a	n/a	n/a	63,872	63,993	64,186	64,498	64,908
Vans	n/a	38,154	41,457	45,306	46,257	47,229	48,221	49,233	50,267
ICE	n/a	n/a	n/a	n/a	45,268	45,955	46,708	47,576	48,538
EV	n/a	n/a	n/a	n/a	55,268	55,046	54,890	54,849	54,902
Car average price change YoY	n/a	n/a	+9.9%	+0.9%	+2.1%	+2.1%	+2.1%	+2.1%	+2.1%
Van average price change YoY	n/a	n/a	+8.7%	+9.3%	+2.1%	+2.1%	+2.1%	+2.1%	+2.1%

Source: Own work based on Mercedes-Benz Group (2024a), Mercedes-Benz Group (2023a), Mercedes-Benz Group (2022).

Table 4: Revenue per Business segment - Base case. (2020 - 2028)

Revenue (in bio EUR)	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**
Cars	n/a	97	112	113	111	111	113	114	116
ICE	n/a	n/a	n/a	n/a	81	75	71	66	62
EV	n/a	n/a	n/a	n/a	31	36	42	47	54
Vans	n/a	15	17	20	20	19	20	20	20
ICE	n/a	n/a	n/a	n/a	18	18	18	17	17
EV	n/a	n/a	n/a	n/a	2	2	2	2	3
Mobility	n/a	22	21	20	15	14	13	12	11
Total	n/a	134	150	153	146	144	145	145	146
Out of which from selling EVs	n/a	n/a	n/a	n/a	24.5%	28.8%	33.0%	37.3%	41.5%

Source: Own work based on Mercedes-Benz Group (2024a), Mercedes-Benz Group (2023a), Mercedes-Benz Group (2022).

Car segment remained at the forefront of the company's revenue generation over time, even though it suffered a heavier decrease in SoM in the forecast period than Vans as shown in the Table 2 (0.7pp decrease in share from 2023 to 2028 for Car segment, compared to 0.2pp decrease in the Van business). Main due to, for the revenue to continue in the steadily positive manner (Table 4) is a constant yearly price increase assumed to be imposed by the company (Table 3), offsetting the negative volume impact in the coming years.

Table 5: Average Useful life of PP&E, D&A and PP&E evolution – Base case. (2020 - 2028)

D&A and CAPEX calculus	2020	2021	2022	2023	2024	2025	2026	2027	2028
Average Useful life of PP&E (years)	6	6	7	6	6	6	6	6	6
Depreciation (in bio EUR)	6	4	4	4	4	4	4	4	5
PP&E (in bio EUR)	35	28	27	26	26	27	27	29	30
Average Useful life of Intangible assets (years)	6	6	7	7	7	7	7	7	7
Amortization (in bio EUR)	3	3	2	2	3	3	3	3	3
Intangible Assets (in bio EUR)	16	15	16	18	19	20	22	23	23

Source: Own work based on Mercedes-Benz Group (2024a), Mercedes-Benz Group (2023a), Mercedes-Benz Group (2022).

FCF goes through a variety of trend movements. Surge from 2023 to 2024, driven mainly by the positive effect coming from a decrease in NWC and Net CAPEX. This is partially offset by a decrease in NOPLAT versus PY as presented in the Table 6. Declining period followed, fueled by a stabilizing NWC which brings the FCF down from its highs, combined with higher negativity coming from Net CAPEX and lower NOPLAT level.

Table 6: FCF Calculation – Base case. (2020 – 2028)

DCF Model (in bio EUR)	2020	2021	2022	2023	2024	2025	2026	2027	2028
EBIT	5.2	13.9	17.9	16.9	11.7	9.0	10.8	10.4	11.3
Effective Tax	(1.7)	(4.2)	(4.8)	(4.7)	(3.3)	(2.5)	(3.0)	(2.9)	(3.1)
EBIT	5.2	13.9	17.9	16.9	11.7	9.0	10.8	10.4	11.3
Effective Tax	(1.7)	(4.2)	(4.8)	(4.7)	(3.3)	(2.5)	(3.0)	(2.9)	(3.1)
NOPLAT	3.5	9.7	13.0	12.2	8.4	6.5	7.8	7.5	8.2
Depreciation	6.4	4.4	4.1	4.2	4.1	4.1	4.3	4.5	4.7
CAPEX – Purchase of PP&E	(5.7)	(4.6)	(3.5)	(3.7)	(4.1)	(4.6)	(5.1)	(5.7)	(6.2)
Amortization	2.6	2.6	2.4	2.5	2.9	3.0	3.2	3.4	3.5
CAPEX – Additions to Intangible Assets	(2.8)	(2.7)	(3.4)	(4.5)	(4.4)	(4.3)	(4.4)	(4.4)	(4.4)
Net CAPEX	0.4	(0.3)	(0.4)	(1.6)	(1.5)	(1.7)	(2.0)	(2.2)	(2.4)
NWC	15.5	15.3	14.5	21.6	17.1	17.0	17.1	17.1	17.2
Change in NWC	(6.5)	(0.2)	(0.8)	7.1	(4.5)	(0.1)	0.1	0.0	0.1
Free Cash Flow	10.5	9.6	13.5	3.6	11.4	4.9	5.6	5.3	5.6

Source: Own work based on Mercedes-Benz Group (2024a), Mercedes-Benz Group (2023a), Mercedes-Benz Group (2022).

Risk free rate and Equity Risk Premium are assumed as per Kroll's estimates while beta coefficient stands at 1.2, as mentioned in the chapter 3.6.1 of the thesis. Cost of Equity is then calculated based on the formula (17), while Pre-tax cost of Debt which stands at a level of 3.8% is calculated using the formula (18) considering the synthetic rate spread from Damodaran's estimation of 0.8% for the level of ICR that the company has.

3.7.1.2 Estimation of WACC and Calculation of Value

Table 7: Estimation of WACC

Risk free rate (rf)	3.0%
Beta coefficient (β)	1.2
Equity Risk Premium (ERP)	6.0%
Cost of Equity (Re)	10.2%
Interest Coverage Ratio (ICR)	>12.5
Synthetic rate spread	0.8%
Pre-tax cost of Debt (Rd)	3.8%
Proportion of Equity in the Capital Structure	37.5%
Proportion of Debt in the Capital Structure	62.5%
Tax rate (T)	27.6%
WACC	5.5%

Source: Own Work based on Kroll (2024), Damodaran (2021), Mercedes-Benz Group (2024a).

As a result, WACC is calculated to be 5.5% as per the formula (16) and shown in the Table 7, whilst remain flat as part of the model assumptions as seen in the Table 8.

Table 8: Calculation of Value – Base case.

Value estimation for the date 31.12.2023 (in bio EUR)		**2024**	**2025**	**2026**	**2027**	**2028**
Free Cash Flow (FCF)		11	5	6	5	6
Discount Rate (WACC in %)		5.5	5.5	5.5	5.5	5.5
Discount Factor		0.948	0.898	0.851	0.807	0.765
Present Value of FCF	29	11	4	5	4	4
Normalized FCF after 2028						8
Terminal Value growth rate (%)						1.3
Terminal Value of FCF beyond 2028 (TV)						187
Present Value of the TV	143					
Enterprise Value	171					
Minus: Debt Value	109					
Equity Value	63					
Ordinary Shares Outstanding (in bio units)	1.0					
Estimated Share price (in EUR)	60.2					
EIKON Share price (in EUR)	62.9					
Difference (in %)	-4.4%					

Source: Own work.

Present value of FCF, that stands at 29 bio EUR, coupled with the Present value of the TV, which is 143 bio EUR, are calculated based on the formula (20) and together they make the Enterprise value. Equity value is determined with the formula (22) adding up to

63 bio EUR. The estimated share price is calculated with the formula (23) and stands at a point of 60.2 EUR per share in comparison to the valuation date price of 62.9 EUR per share, with the negative variance of 2.7 EUR per share or -4.4%.

3.7.2 First scenario – ESG enhancement impact on Production Mix

We now present the financial implications of the Production Mix assumption on the company's valuation. By analysing these impacts, we aim to provide deeper insight into the strategic importance of production flexibility within the automotive industry.

3.7.2.1 Estimation of Free Cash Flows

Table 9: Income statement – 1st sc. (2020 - 2028)

Income Statement (in bio EUR)	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**
Revenues	121.8	133.9	150.0	153.2	146.1	143.7	144.3	146.3	144.0
COGS	(101.6)	(103.2)	(116.0)	(118.8)	(117.4)	(118.1)	(117.8)	(118.0)	(117.9)
Selling Expenses	(9.0)	(9.2)	(9.5)	(9.7)	(9.5)	(9.2)	(9.3)	(9.4)	(9.2)
G&A Expenses	(2.5)	(2.8)	(2.6)	(2.7)	(2.5)	(2.5)	(2.5)	(2.6)	(2.5)
Non-Capitalized R&D	(4.8)	(5.5)	(5.6)	(6.2)	(6.1)	(6.0)	(6.1)	(6.1)	(6.0)
Other Operating inc/exp	1.3	0.7	1.5	1.2	1.2	1.2	1.2	1.2	1.2
EBIT	5.2	13.9	17.9	16.9	11.7	9.0	9.9	11.5	9.5

Source: Own work based on Mercedes-Benz Group (2024a), Mercedes-Benz Group (2023a), Mercedes-Benz Group (2022).

Years 2024 and 2025 have the same drivers for the EBIT drop as mentioned in the Base case part. After the period of decline, EBIT recovers, heavily supported by an increase in revenue driven by pricing assumptions, partially offset by falling volume numbers. In 2028 the revenue drops as a culmination of volume decline impact outweighing the pricing by the company.

Table 10: Volume evolution – 1st sc. (2020 - 2028)

Volume (in mio units)	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**
Total Market (all passenger cars sold)	54.7	57.3	58.6	65.3	68.2	71.7	74.0	76.0	77.5
Cars	2.09	1.94	2.04	2.04	1.97	1.92	1.86	1.78	1.68
ICE	n/a	1.67	1.71	1.64	1.50	1.36	1.20	1.02	0.83

To be continued

Table 11: Volume evolution – 1st sc. (2020 - 2028) (cont.)

Volume (in mio units)	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**
EV	n/a	0.27	0.33	0.40	0.47	0.56	0.66	0.76	0.85
Vans	0.37	0.39	0.42	0.45	0.43	0.41	0.39	0.35	0.29
ICE	n/a	0.37	0.40	0.43	0.39	0.35	0.30	0.23	0.14
EV	n/a	0.01	0.02	0.02	0.03	0.05	0.09	0.12	0.16
Total units sold	2.46	2.33	2.46	2.49	2.40	2.33	2.25	2.13	1.97
EVs in the product portfolio	n/a	12.3%	14.2%	17.0%	21.1%	26.4%	33.1%	41.3%	51.1%
SoM combined	4.5%	4.1%	4.2%	3.8%	3.5%	3.3%	3.0%	2.8%	2.5%
Cars share	3.8%	3.4%	3.5%	3.1%	2.9%	2.7%	2.5%	2.3%	2.2%
Vans share	0.7%	0.7%	0.7%	0.7%	0.6%	0.6%	0.5%	0.5%	0.4%

Source: Own work based on Mercedes-Benz Group (2024a), Mercedes-Benz Group (2023a), Mercedes-Benz Group (2022).

Mercedes' SoM deteriorates over time falling well below the 3%. The impact falling volumes of the traditional ICE vehicles have on share is to some degree countered by the rise of new EV sales as shown in Table 10.

Table 12: Average Vehicle price evolution – 1st sc. (2020 - 2028)

Average Vehicle prices (EUR per unit)	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**
Cars	n/a	49,752	54,688	55,162	56,320	57,503	60,378	65,208	69,773
ICE	n/a	n/a	n/a	n/a	53,926	54,850	57,484	62,115	66,550
EV	n/a	n/a	n/a	n/a	63,926	63,941	65,666	69,388	72,914
Vans	n/a	38,154	41,457	45,306	46,257	47,229	49,590	53,557	57,306
ICE	n/a	n/a	n/a	n/a	45,463	46,025	47,794	51,006	53,893
EV	n/a	n/a	n/a	n/a	55,463	55,116	55,976	58,278	60,257
Car average price change YoY	n/a	n/a	+9.9%	+0.9%	+2.1%	+2.1%	+5.0%	+8.0%	+7.0%
Van average price change YoY	n/a	n/a	+8.7%	+9.3%	+2.1%	+2.1%	+5.0%	+8.0%	+7.0%

Source: Own work based on Mercedes-Benz Group (2024a), Mercedes-Benz Group (2023a), Mercedes-Benz Group (2022).

Presented in the Table 12 it is clear that the maturing of the EV environment can be expected for both Cars and Vans categories, as the company is heading towards its improved sustainability goal of achieving more than 50% of total revenue coming from selling EVs by 2028. Car segment has seen a steep rise in revenue as sales switch more to pricier EVs (Table 10 & Table 11) reaching 117 bio EUR in revenue in 2028. On the other side, we have the Mobility sector that is seeing a plunge as the overall vehicle sales ease going from approximately 20 bio EUR in 2023 to half of that amount (10 bio EUR) in 2028.

Table 13: Revenue per Business segment – 1st sc. (2020 - 2028)

Revenue (in bio EUR)	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**
Cars	n/a	97	112	113	111	111	112	116	117
ICE	n/a	n/a	n/a	n/a	81	75	69	63	55
EV	n/a	n/a	n/a	n/a	30	36	43	52	62
Vans	n/a	15	17	20	20	19	19	19	17
ICE	n/a	n/a	n/a	n/a	18	16	14	12	7
EV	n/a	n/a	n/a	n/a	2	3	5	7	9
Mobility	n/a	22	21	20	15	14	13	12	10
Total	n/a	134	150	153	146	144	144	146	144
Out of which from selling EVs	n/a	n/a	n/a	n/a	22.0%	27.0%	33.3%	40.7%	50.0%

Source: Own work based on Mercedes-Benz Group (2024a), Mercedes-Benz Group (2023a), Mercedes-Benz Group (2022).

Table 14: Combined SoM evolution – 1st sc. (2020 - 2028)

SoM Combined	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**
Cars	3.8%	3.4%	3.5%	3.1%	2.9%	2.7%	2.5%	2.3%	2.2%
ICE	n/a	2.9%	2.9%	2.5%	2.2%	1.9%	1.6%	1.3%	1.1%
EV	n/a	0.5%	0.6%	0.6%	0.7%	0.8%	0.9%	1.0%	1.1%
Vans	0.7%	0.7%	0.7%	0.7%	0.6%	0.6%	0.5%	0.5%	0.4%
ICE	n/a	0.7%	0.7%	0.7%	0.6%	0.5%	0.4%	0.3%	0.2%
EV	n/a	0.0%	0.0%	0.0%	0.0%	0.1%	0.1%	0.2%	0.2%
Total	4.5%	4.1%	4.2%	3.8%	3.5%	3.3%	3.0%	2.8%	2.5%

Source: Own work based on Mercedes-Benz Group (2024a), Mercedes-Benz Group (2023a), Mercedes-Benz Group (2022).

Table 15: Average Useful life of PP&E, D&A and PP&E evolution – 1st sc. (2020 - 2028)

D&A and CAPEX calculus	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**
Average Useful life of PP&E (years)	6	6	7	6	6	6	6	6	6
Depreciation (in bio EUR)	6	4	4	4	4	4	4	5	5
PP&E (in bio EUR)	35	28	27	26	26	27	28	30	32
Average Useful life of Intangible assets (years)	6	6	7	7	7	7	7	7	7
Amortization (in bio EUR)	3	3	2	2	3	3	3	3	3
Intangible Assets (in bio EUR)	16	15	16	18	19	20	22	23	23

Source: Own work based on Mercedes-Benz Group (2024a), Mercedes-Benz Group (2023a), Mercedes-Benz Group (2022).

FCF movement is largely being dictated by the fluctuation of EBIT/NOPLAT levels coupled with the Net CAPEX negativity increase in the looked at period. Net CAPEX negativity mainly comes from intensive expansions of PP&E together with a solid

addition to Intangible assets which overflows D&A by a significant amount. In addition to beforementioned factors, NWC played a significant role in reaching the FCF amount, by not considerably deviating from year to year after 2024.

Table 16: FCF Calculation – 1st sc. (2020 - 2028)

DCF Model (in bio EUR)	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**
EBIT	5.2	13.9	17.9	16.9	11.7	9.0	9.9	11.5	9.5
Effective Tax	(1.7)	(4.2)	(4.8)	(4.7)	(3.3)	(2.5)	(2.8)	(3.2)	(2.7)
NOPLAT	3.5	9.7	13.0	12.2	8.4	6.5	7.2	8.3	6.9
Depreciation	6.4	4.4	4.1	4.2	4.1	4.2	4.5	4.7	5.1
CAPEX – Purchase of PP&E	(5.7)	(4.6)	(3.5)	(3.7)	(4.3)	(5.0)	(5.7)	(6.6)	(7.2)
Amortization	2.6	2.6	2.4	2.5	2.9	3.0	3.2	3.4	3.5
CAPEX – Additions to Intangible Assets	(2.8)	(2.7)	(3.4)	(4.5)	(4.4)	(4.3)	(4.3)	(4.4)	(4.3)
Net CAPEX	0.4	(0.3)	(0.4)	(1.6)	(1.7)	(2.1)	(2.4)	(2.9)	(3.0)
NWC	15.5	15.3	14.5	21.6	17.1	17.0	17.0	17.3	17.0
Change in NWC	(6.5)	(0.2)	(0.8)	7.1	(4.5)	(0.1)	(0.0)	0.3	(0.3)
Free Cash Flow	10.5	9.6	13.5	3.6	11.2	4.6	4.7	5.1	4.2

Source: Own work based on Mercedes-Benz Group (2024a), Mercedes-Benz Group (2023a), Mercedes-Benz Group (2022).

3.7.2.2 Estimation of WACC

Following the assumption stated for WACC, presented in the following are components of linear regression conducted in attempt to estimate WACC, based on the growing EV share within the product portfolio of the company, as well as the formulas utilized for reaching the presented figures.

For the purpose of un-levering three-year betas of peer companies, the formula (24) was used, where T represents Corporate Tax rate and D/E, Debt to Equity ratio of the related peer company;

$$\beta unlevered = \frac{\beta levered}{1+(1-T)*\frac{D}{E}}. \quad (24)$$

After the un-levering has been conducted, it is then necessary to adjust those betas with appropriate T and D/E of Mercedes Benz Group, so that the betas could be comparable. This is achieved with the formula (25);

$$\beta levered = \beta unlevered \cdot \left(1 + (1-T) \cdot \frac{D}{E}\right). \quad (25)$$

As the model uses as a dependent variable, the three-year re-levered beta of each peer company, and the independent variable is the share of EVs in their total production portfolio. The underlying assumption is that a firm's exposure to EVs influences its

systematic risk, either through technological uncertainty, regulatory exposure, or market volatility. By utilizing the formula (26) we can estimate Mercedes Benz's beta, given the different EV share within the company's portfolio throughout the years;

$$\beta MBG = b + m * EV_ShareMBG. \quad (26)$$

Parameters of the linear regression: b, representing the intercept and m, representing the slope or sensitivity of beta to EV share, must be determined beforehand, for the estimation of beta to be possible.

Table 17: Industry Peers' 3-year Levered Beta calculation – 1st sc.

Date: 31/12/2023 **Company Name**	**Market Capitalization (in bio EUR)**	**Total Debt (in bio EUR)**	**D/E**	**Corporate tax rate (%)**	**3 Y Beta unlevered**	**3 Y Beta Levered**
Hyundai Motor Company (KOSE:A005380)	30	88	3.0	26.3	0.3	0.6
BMW (XTRA:BMW)	65	95	1.5	28.8	0.5	1.2
Volkswagen AG (XTRA:VOW3)	56	233	4.2	22.7	0.3	0.6
Stellantis N.V. (BIT:STLAM)	66	30	0.4	16.9	1.0	2.2
General Motors Company (NYSE:GM)	45	111	2.4	5.4	0.4	0.9

Source: Own work based on Hyundai Motor Company (2024), Volkswagen Group (2024), Stellantis (2024), BMW Group (2024), General Motors (2024).

Table 18: EV share within the production portfolio per company – 1st sc. (year end 2023)

Company Name	**EV/Product portfolio (%)**
BMW (XTRA:BMW)	25.1
Volkswagen AG (XTRA:VOW3)	11.1
Stellantis N.V. (BIT:STLAM)	3.4
General Motors Company (NYSE:GM)	1.2
Hyundai Motor Company (KOSE:A005380)	16.5
Mercedes-Benz Group AG (XTRA:MBG)	17.0

Source: Own work based on Hyundai Motor Company (2024), Volkswagen Group (2024), Stellantis (2024), BMW Group (2024), General Motors (2024).

Table 19: Calculated key components of the linear regression formula – 1st sc.

Standard Deviation of 3Y Beta levered	0.6
Standard Deviation of Share of EV in Portfolio	0.1
Correlation of 3y levered betas and EV/Prod. Portfolio.	-0.3
Slope (m)	-1.8
Mean value of betas	1.1
Mean value of EV shares (%)	12.4
Intercept (b)	1.3

Source: Own work.

Table 20: Estimation of Mercedes Benz Group's Levered Beta and WACC – 1st sc.

Component/Year	**2024**	**2025**	**2026**	**2027**	**2028**
EV share within the Portfolio (%)	21.1	26.4	33.1	41.3	51.1
Levered Beta (based on EV share of Portfolio)	0.955	0.866	0.866	0.866	0.866
WACC (%)	5.0	4.8	4.8	4.8	4.8

Source: Own work.

Having calculated all the necessary data for estimating new beta coefficient of Mercedes Benz Group shown in the Table 16 and Table 18, projection of WACC for each year is further being influenced by the change in production mix of the company as presented in Table 19. The lowest value of WACC is 4.8%, going from 2025 onwards, this is happening as the newly computed Mercedes' beta coefficient is equalized to the capped level of beta determined, and considering that other aspects of WACC calculation from the formula (16) stay constant, the value of WACC remains floored till the end of the forecasting period.

3.7.2.3 Calculation of Value

Table 21: Calculation of Value – 1st sc.

Value estimation for the date 31.12.2023 (in bio EUR)		**2024**	**2025**	**2026**	**2027**	**2028**
Free Cash Flow (FCF)		11	5	5	5	4
Discount Rate (WACC in %)		5.0	4.8	4.8	4.8	4.8
Discount Factor		0.953	0.909	0.868	0.829	0.791
Present Value of FCF	27	11	4	4	4	3
Normalized FCF after 2028						7

To be continued

Table 22: Calculation of Value – 1st sc. (cont.)

Value estimation for the date 31.12.2023 (in bio EUR)		**2024**	**2025**	**2026**	**2027**	**2028**
Terminal Value growth rate (%)						1.3
Terminal Value of FCF beyond 2028 (TV)						193
Present Value of the TV	153					
Enterprise Value	179					
Minus: Debt Value	109					
Equity Value	71					
Ordinary Shares Outstanding (in bio units)	1.0					
Estimated Share price (in EUR)	67.9					
EIKON Share price (in EUR)	62.9					
Difference (in %)	+8.0%					

Source: Own work.

TV, calculated using the formula (21) is at 193 bio EUR. Present value of FCF combined with the Present value of the TV considering the formula (20) is projected to be 153 bio EUR. Taking into account the formula (22) Equity value is determined at the level of 71 bio EUR. Projection of share price using the formula (23) is assessed at 67.9 EUR per share, indicating a 5.0 EUR higher share price relative to the reference price of 62.9 EUR per share observed on the valuation date or +8.0%, thereby presenting a strong upward adjustment in market valuation.

3.7.3 Second scenario – ESG enhancement impact on Cost

In the following section, we present the results of the second scenario, which evaluates the financial impact of cost enhancement through higher investments in efficiency and technology. This scenario analysis highlights how additional capital allocation toward operational improvements influences the company's valuation and long-term performance.

3.7.3.1 Estimation of Free Cash Flows

Table 23: Income statement – 2nd sc. (2020 - 2028)

Income Statement (in bio EUR)	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**
Revenues	121.8	133.9	150.0	153.2	146.1	143.7	145.3	145.1	146.0
COGS	(101.6)	(103.2)	(116.0)	(118.8)	(117.4)	(118.1)	(117.2)	(114.9)	(113.4)
Selling Expenses	(9.0)	(9.2)	(9.5)	(9.7)	(9.5)	(9.2)	(9.3)	(9.3)	(9.4)

To be continued

Table 24: Income statement – 2nd sc. (2020 - 2028) (cont.)

Income Statement (in bio EUR)	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**
G&A Expenses	(2.5)	(2.8)	(2.6)	(2.7)	(2.5)	(2.5)	(2.5)	(2.5)	(2.5)
Non-Capitalized R&D	(4.8)	(5.5)	(5.6)	(6.2)	(6.4)	(6.7)	(7.1)	(7.5)	(7.8)
Other Operating inc/exp	1.3	0.7	1.5	1.2	1.2	1.2	1.2	1.2	1.2
EBIT	5.2	13.9	17.9	16.9	11.4	8.4	10.2	12.1	14.1

Source: Own work based on Mercedes-Benz Group (2024a), Mercedes-Benz Group (2023a), Mercedes-Benz Group (2022).

Similarly to the base scenario, the EBIT shrinkage in 2024 compared to PY is explained by a steeper revenue decline. EBIT is expected to bounce back after a two-year decline, supported by improving COGS environment (impacted by the previous years' CAPEX and R&D additional investments) and stable revenue level. Volume levels are aligned to the ones of the Base case as well as the pricing evolution presented respectively in the Table 22 and Table 23.

Table 25: Volume evolution – 2nd sc. (2020 - 2028)

Volume (in mio units)	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**
Total Market (all passenger cars sold)	54.7	57.3	58.6	65.3	68.2	71.7	74.0	76.0	77.5
Cars	2.09	1.94	2.04	2.04	1.97	1.92	1.92	1.90	1.89
ICE	n/a	1.67	1.71	1.64	1.49	1.37	1.29	1.19	1.10
EV	n/a	0.27	0.33	0.40	0.48	0.55	0.64	0.71	0.79
Vans	0.37	0.39	0.42	0.45	0.43	0.41	0.41	0.40	0.40
ICE	n/a	0.37	0.40	0.43	0.38	0.35	0.33	0.31	0.29
EV	n/a	0.01	0.02	0.02	0.04	0.06	0.08	0.09	0.11
Total units sold	2.46	2.33	2.46	2.49	2.40	2.33	2.33	2.30	2.28
EVs in the product portfolio	n/a	12.3%	14.2%	17.0%	21.9%	26.0%	30.5%	34.8%	39.2%
SoM Combined	4.5%	4.1%	4.2%	3.8%	3.5%	3.3%	3.0%	2.8%	2.5%
Cars share	3.8%	3.4%	3.5%	3.1%	2.9%	2.7%	2.6%	2.5%	2.4%
Vans share	0.7%	0.7%	0.7%	0.7%	0.6%	0.6%	0.6%	0.5%	0.5%

Source: Own work based on Mercedes-Benz Group (2024a), Mercedes-Benz Group (2023a), Mercedes-Benz Group (2022).

Table 26: Average Vehicle price evolution – 2nd sc. (2020 - 2028)

Average Vehicle prices (EUR per unit)	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**
Cars	n/a	49,752	54,688	55,162	56,320	57,503	58,710	59,943	61,202
ICE	n/a	n/a	n/a	n/a	53,872	54,902	56,004	57,225	58,545
EV	n/a	n/a	n/a	n/a	63,872	63,993	64,186	64,498	64,908
Vans	n/a	38,154	41,457	45,306	46,257	47,229	48,221	49,233	50,267
ICE	n/a	n/a	n/a	n/a	45,268	45,955	46,708	47,576	48,538
EV	n/a	n/a	n/a	n/a	55,268	55,046	54,890	54,849	54,902
Car average price change YoY	n/a	n/a	+9.9%	+0.9%	+2.1%	+2.1%	+2.1%	+2.1%	+2.1%
Van average price change YoY	n/a	n/a	+8.7%	+9.3%	+2.1%	+2.1%	+2.1%	+2.1%	+2.1%

Source: Own work based on Mercedes-Benz Group (2024a), Mercedes-Benz Group (2023a), Mercedes-Benz Group (2022).

Table 27: Revenue per Business segment – 2nd sc. (2020 - 2028)

Revenue (in bio EUR)	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**
Cars	n/a	97	112	113	111	111	113	114	116
ICE	n/a	n/a	n/a	n/a	81	75	71	66	62
EV	n/a	n/a	n/a	n/a	31	36	42	47	54
Vans	n/a	15	17	20	20	19	20	20	20
ICE	n/a	n/a	n/a	n/a	18	18	18	17	17
EV	n/a	n/a	n/a	n/a	2	2	2	2	3
Mobility	n/a	22	21	20	15	14	13	12	11
Total	n/a	134	150	153	146	144	145	145	146

Source: Own work based on Mercedes-Benz Group (2024a), Mercedes-Benz Group (2023a), Mercedes-Benz Group (2022).

Table 28: Average Useful life of PP&E, D&A and PP&E evolution – 2nd sc. (2020 - 2028)

D&A and CAPEX calculus	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**
Average Useful life of PP&E (years)	6	6	7	6	6	6	6	6	6
Depreciation (in bio EUR)	6	4	4	4	4	4	5	5	5
PP&E (in bio EUR)	35	28	27	26	26	27	29	31	34
Average Useful life of Intangible assets (years)	6	6	7	7	7	7	7	7	7
Amortization (in bio EUR)	3	3	2	2	3	3	3	4	4
Intangible Assets (in bio EUR)	16	15	16	18	19	21	23	25	26

Source: Own work based on Mercedes-Benz Group (2024a), Mercedes-Benz Group (2023a), Mercedes-Benz Group (2022).

Based on the figures presented (Table 26), we can state that FCF initial surge reasoning in 2024 is aligned to the one of the Base case, after which the steady growth occurred,

supported by an increase in NOPLAT, primarily influenced by falling COGS level and also higher pricing in the coming years, partially offset by volume decline coupled with higher R&D costs. Negative pressure on the bottom line is also expected from the rising CAPEX investments averaging an 11.1% YoY increase throughout the forecasting period.

Table 29: FCF Calculation – 2nd sc. (2020 - 2028)

DCF Model (in bio EUR)	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**
EBIT	5.2	13.9	17.9	16.9	11.4	8.4	10.2	12.1	14.1
Effective Tax	(1.7)	(4.2)	(4.8)	(4.7)	(3.2)	(2.3)	(2.9)	(3.4)	(3.9)
NOPLAT	3.5	9.7	13.0	12.2	8.1	6.0	7.4	8.7	10.1
Depreciation	6.4	4.4	4.1	4.2	4.1	4.3	4.6	4.9	5.3
CAPEX – Purchase of PP&E	(5.7)	(4.6)	(3.5)	(3.7)	(4.3)	(5.2)	(6.2)	(7.1)	(8.2)
Amortization	2.6	2.6	2.4	2.5	2.9	3.1	3.3	3.7	3.9
CAPEX – Additions to Intangible Assets	(2.8)	(2.7)	(3.4)	(4.5)	(4.6)	(4.8)	(5.2)	(5.4)	(5.7)
Net CAPEX	0.4	(0.3)	(0.4)	(1.6)	(1.9)	(2.6)	(3.4)	(4.0)	(4.7)
NWC	15.5	15.3	14.5	21.6	17.1	17.0	17.1	17.1	17.2
Change in NWC	(6.5)	(0.2)	(0.8)	7.1	(4.5)	(0.1)	0.1	0.0	0.1
Free Cash Flow	10.5	9.6	13.5	3.6	10.7	3.5	3.9	4.7	5.4

Source: Own work based on Mercedes-Benz Group (2024a), Mercedes-Benz Group (2023a), Mercedes-Benz Group (2022).

3.7.3.2 Estimation of WACC and Calculation of Value

Table 30: Estimation of WACC

Risk free rate (rf)	3.0%
Beta coefficient (β)	1.2
Equity Risk Premium (ERP)	6.0%
Cost of Equity (Re)	10.2%
Interest Coverage Ratio (ICR)	>12.5
Synthetic rate spread	0.8%
Pre-tax cost of Debt (Rd)	3.8%
Proportion of Equity in the Capital Structure	37.5%
Proportion of Debt in the Capital Structure	62.5%
Tax rate (T)	27.6%
WACC	5.5%

Source: Own Work based on Kroll (2024), Damodaran (2021), Mercedes-Benz Group (2024a).

Table 31: Calculation of Value – 2nd sc.

Value estimation for the date 31.12.2023 (in bio EUR)	**2024**	**2025**	**2026**	**2027**	**2028**
Free Cash Flow (FCF)	11	4	4	5	5
Discount Rate (WACC in %)	5.5	5.5	5.5	5.5	5.5

To be continued

Table 32: Calculation of Value – 2nd sc. (cont.)

Value estimation for the date 31.12.2023 (in bio EUR)		**2024**	**2025**	**2026**	**2027**	**2028**
Discount Factor		0.948	0.898	0.851	0.807	0.765
Present Value of FCF	24	10	3	3	4	4
Normalized FCF after 2028						9
Terminal Value growth rate (%)						1.3
Terminal Value of FCF beyond 2028 (TV)						209
Present Value of the TV	160					
Enterprise Value	184					
Minus: Debt Value	109					
Equity Value	76					
Ordinary Shares Outstanding (in bio units)	1.0					
Estimated Share price (in EUR)	72.8					
EIKON Share price (in EUR)	62.9					
Difference (in EUR)	+15.6%					

Source: Own work.

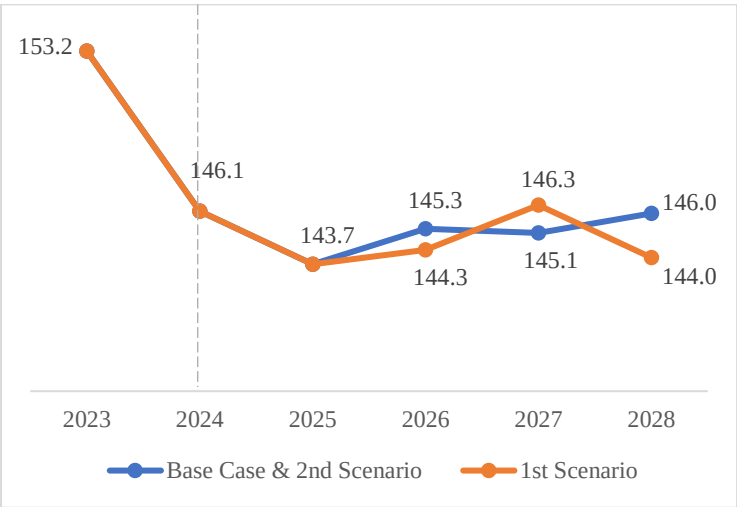
WACC is estimated to be 5.5% with the formula (16) and is aligned with the Base case as well as all the components of which WACC is composed of (Table 27). This estimate is used consistently throughout time (Table 28). Enterprise value of 184 bio EUR is determined based on the formula (20), while the Equity value of 76 bio EUR is estimated using the formula (22). As for the share price, it has been calculated to be 72.8 EUR per share employing the formula (23), which stands well above the price on the date of valuation of 62.9 EUR per share, with a total positive variance of 9.8 EUR per share or +15.6%.

3.7.4 Scenario comparison and commentary

Going into this part of the paper, we are focusing on main differences between scenarios, comparing how company's key financial parameters differ when considering 3 unique perspectives, amongst which are Revenue, Cost, EBIT margin, FCFs and at the end Price per share.

When looking at the Figure 13, we can notice that the Base case and the 2nd scenario represent one line. The reason behind it is that the revenue levels throughout the years of the 2nd and the Base case are the same, driven by identical assumptions impacting revenue, hence adding another line showing an equal trend would not have any value added. This is the logic followed in every other figure having equivalent values for two different scenarios. As for the presented values, differences that occur are driven by 2 factors: Volume and pricing assumptions.

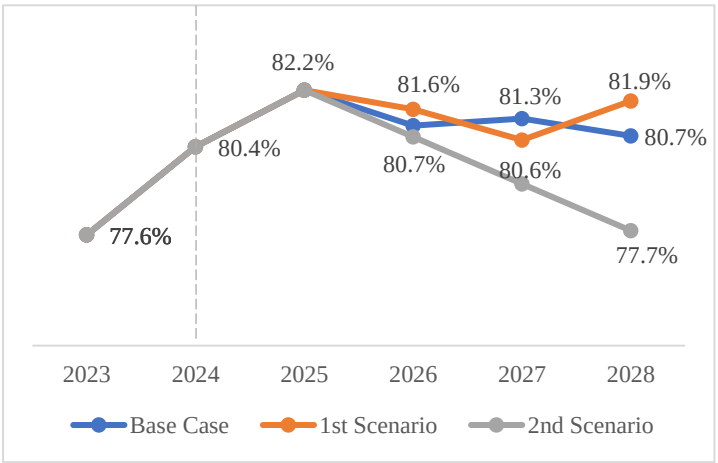
Figure 13: Revenue levels per year comparison (in bio EUR)



Source: Own work.

In 2026, negative impact of volume decrease present in the 1st scenario, due to a shift in product mix, outweighs the positivity of higher pricing assumed than in the base and 2nd scenario, which is shown as a gap on the graph in favour of the other two cases. The gap in 2027, was in favour of the 1st scenario due to an even higher price increase, given the evolved portfolio mix, which overturned the negativity of volume impact, hence the increase in revenue that is for 1.2 billion EUR higher than the level of revenue other two perspectives have. But in 2028 the situation flopped as the lower price increase assumed in the 1st scenario only partially offset the volume numbers decrease financial implication, indicating a variance of negative 2 billion EUR in comparison to the other looked at scenarios.

Figure 14: COGS to Revenue % per year comparison

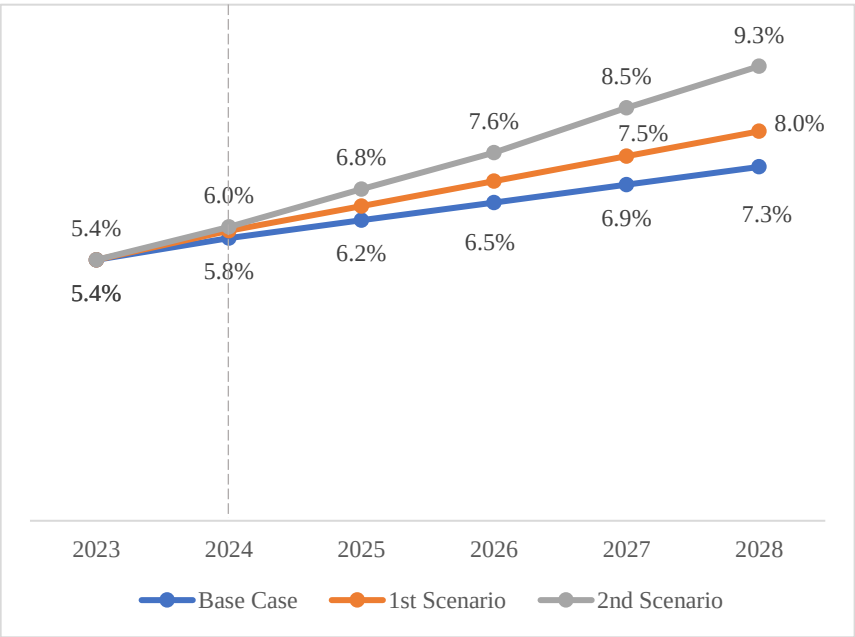


Source: Own work.

All three scenarios have the same COGS % of Revenue up until 2026, as presented in Figure 14, after which until the end of the forecast period, each had a unique %. Main

two drivers of difference are firstly Revenue balances each one has which diverge in 2026, and the other one is the decrease in COGS level in the 2nd scenario, driven by activation of efficiencies from investing more in R&D and CAPEX than the other two perspectives. This results in the highest share in Revenue seen for the 1st scenario, with the difference of 4.2pp than the 2nd scenario having the lowest % and 1.2pp when compared to the base case.

Figure 15: CAPEX to Revenue % per year comparison

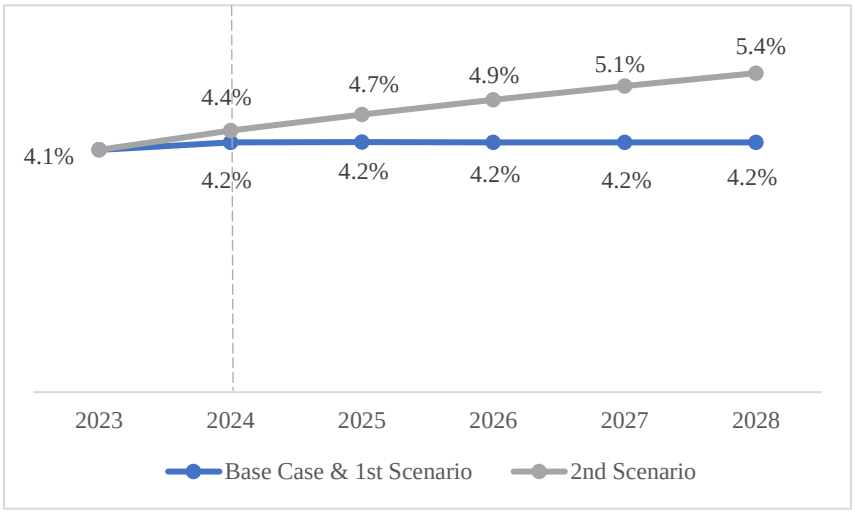


Source: Own work.

CAPEX % of Revenue are diverging from the start, as different scenarios have different levels of CAPEX being invested. The 2nd scenario as the most investment intensive has, throughout the forecasted period, the highest CAPEX share in Revenue as the company tries to, while transitioning to new EV productions, adhere to the already in place production systems. Base case is the most conservative one when compared to the other two scenarios, as the gap between them widens as time passes, ending up with the variance of 2pp compared to the 2nd and 1.3pp versus the 1st scenario in 2028 as seen in the Figure 15.

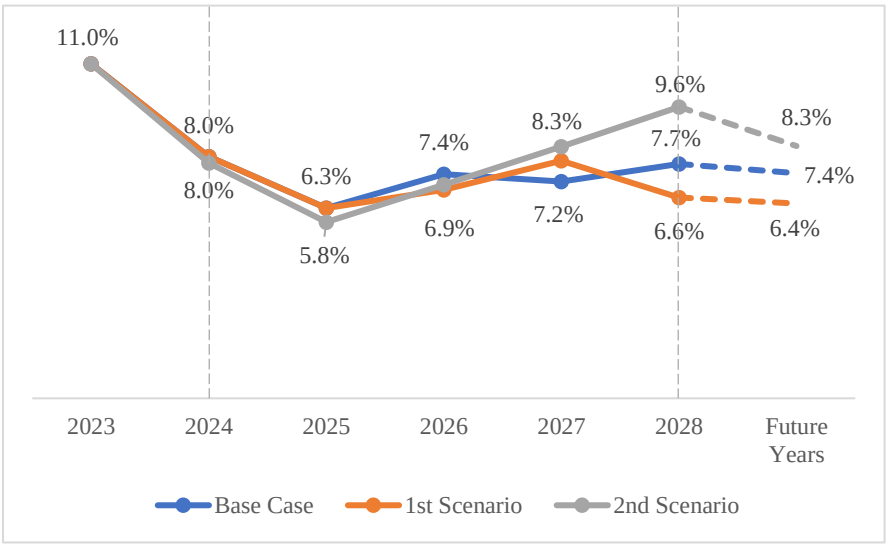
As for the financials relating to Non-Capitalized R&D spending in comparison to the Revenue generated, when looking into the Figure 16, Base case and the 1st scenario lye on the similar level remaining relatively flat throughout the years. While the 2nd assumes that the company invests a higher portion of its revenue, apart from CAPEX, also in R&D to try and alter the current way of producing vehicles. The variance between the lines grows wider as approaching 2028, going from 0.2pp in 2024 all the way to 1.2pp in 2028.

Figure 16: Non-Capitalized R&D to Revenue % per year comparison



Source: Own work.

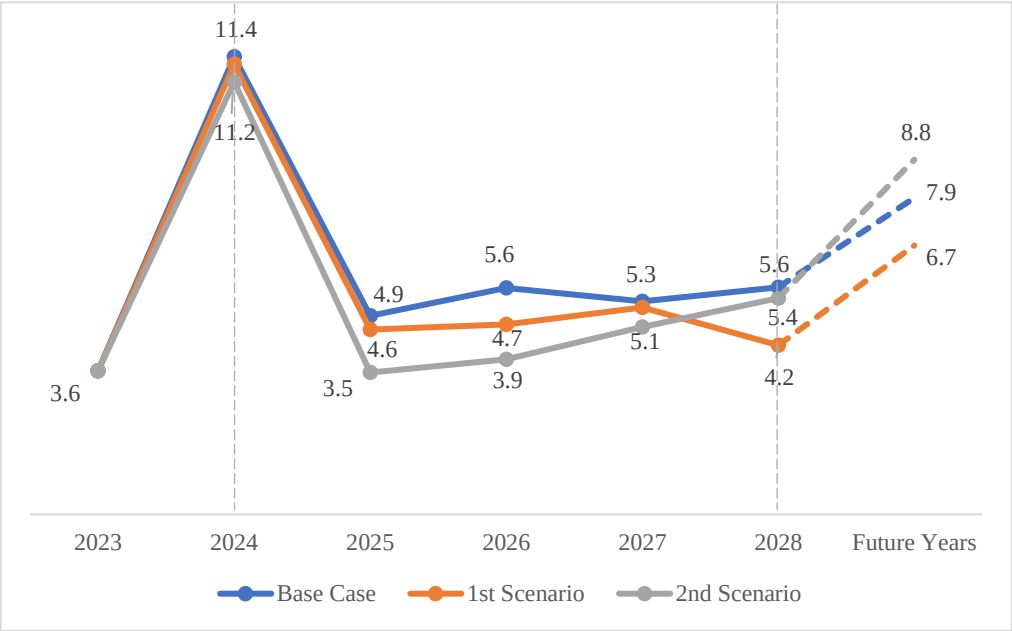
Figure 17: EBIT Margins per year comparison



Source: Own work.

One of the key indicators of company's business efficiency, known as the EBIT margin, is most promising when looked at the 2nd perspective (Figure 17). Showing an exponential increase over time, driven by higher efficiencies in vehicle production, 2nd scenario reaches a 9.6% of EBIT Margin in 2028, outperforming both the Base and the 1st scenario respectively by 1.9pp and 3.0pp. This gap is expected to narrow in the years following 2028, with the variances versus the Base and 1st scenario being positive 0.9pp and 1.9pp respectively, mainly driven by a stable revenue expectations and more efficient cost structure with the emphasis on COGS in other scenarios.

Figure 18: FCF levels per year comparison (in bio EUR)

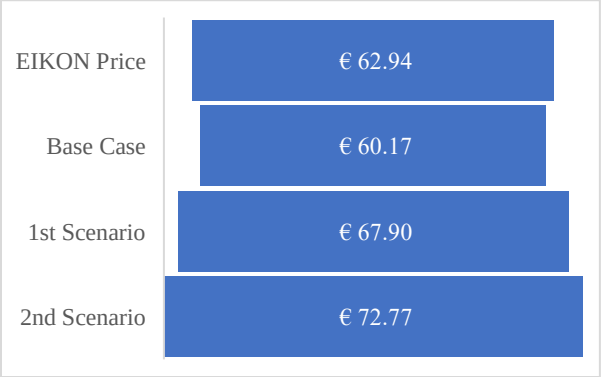


Source: Own work.

Reflecting the overall company performance in each scenario, numbers shown by Figure 18 indicate that the most success in generating cash for further investments and growth after 2028, is highly probable with the 2nd scenario, driven by more efficient production, and stable revenue, partially offset by higher investment in CAPEX and R&D in the earlier years of the forecasting period. Base case keeps a stable FCF level through the years, averaging 5.4 bio EUR in FCF in the period of 2025 till 2028. When compared to the other 2 scenarios makes it the most attractive when it comes to FCF stability and the amount of FCF generated, but on the other hand it is perceived as a bit more conservative in the sustainability sense. Overall, biggest variance in generated FCF during 2028 is seen when comparing the Base case and 1st scenario and it totals 1.4 bio EUR. This variance is explained by the 1st scenario's lesser pricing assumed (7% YoY increase) compared to 2027 (8% YoY increase), coupled with the volume negative impact. This scenario's high pricing and orientation towards the EV segment cost the company disposable cash.

As a result of all unique expectations and assumptions set per each scenario, highest valuation price on the date 31.12.2023 is calculated for the 2nd scenario as depicted on the Figure 19. With the positive difference of 9.83 EUR per share, compared to the actual price on the beforementioned date and 12.60 EUR per share variance in comparison to the Base case, the value expectation is the most optimistic for the 2nd scenario with the total price per share of 72.77 EUR.

Figure 19: Price per Share comparison on the date 31.12.2023



Source: Own work.

4 CONCLUSION

The goal of the thesis was to familiarize the reader with the concept of ESG and its components, as well as how it can have a pivotal role when conducting a DCF valuation of the company. This was achieved through thorough theoretical literature review, which highlighted the significant aspects of ESG and possible implications it can have on the valuation process.

The research and modelling performed in this thesis, also aimed to quantify the impact more enhanced ESG practices would have on financial success of Mercedes Benz Group which would at the end reflect through the estimated price of the share. Based on the analysis done, the scenario focused on improving the level of current operations and production setup through higher investments related to R&D and CAPEX, 2nd scenario, had the uppermost estimated share price. With this scenario company could manage to increase both its ESG score and potential share price, while upgrading crucial business components, setting the base for long term competitiveness in an already complex and changing industry.

Thesis examined the changing environment of the automotive industry and the transition through which the key players are going through, by altering their production mix in the direction of electrification. The 1st scenario showed the pros and cons of a more aggressive approach when it comes to electrifying the product portfolio in a relatively short time span by Mercedes Benz Group. It implies that for the company to remain stable financially and business wise, it should adequately approach the transition, without accelerating the process that requires a longer period of implementation and adaptation to the new market environment.

In an era where sustainability has evolved from a strategic option to a business imperative, thesis underscores the critical importance of integrating ESG principles into core corporate strategy to secure long-term resilience, competitiveness, and responsible

growth. The analysis demonstrates that a structured, consumer-focused approach to sustainability not only aligns with emerging market expectations but also strengthens financial performance over time. Ultimately, the findings address the central research question posed in the introduction: investing in sustainability does create value, confirming that the long-term benefits outweigh the required upfront costs.

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