

BAYERISCHE MOTOREN WERKE AG

AUTOMOTIVE INDUSTRY

ANTÓNIO LOPES DE CARVALHO E KUSTER FILIPE
BRUNO MIGUEL CARVALHO DE CARVALHO

COMPANY REPORT

20 DECMEBER 2023

42854@novasbe.pt
51409@novasbe.pt

Bayerische Motoren Werke

- The rise of electric vehicles is driving the automotive sector's expansion, and it is expected to remain the pivotal source of growth. BMW's focus on electric vehicles is expected to continue throughout the foreseeable future.
- Europe's weight on BMW's deliveries has decreased in recent years, with China steadily becoming more prominent for BMW's total car deliveries.
- In February 2022, BMW Group assumed controlling interest in its long-standing joint venture, BMW Brilliance Automotive Ltd., marking a pivotal shift in its strategic positioning in the Chinese market.
- Globally, the corporation faces challenges arising from semiconductor shortages, disruptions in the supply chain, and fluctuations in raw material prices; however, it has successfully maintained a superior operating profit margin compared to most rivals.

Company description

Bayerische Motoren Werke AG is a distinguished German automotive and motorcycle manufacturer with a rich heritage dating back to its founding in 1916. Headquartered in Munich, the company has become a global leader in the premium and luxury automobile and motorcycle segments, encompassing a portfolio of distinct brands, including BMW, BMW Motorrad, MINI, and Rolls-Royce.

The group employs around 150,000 people, operating across a vast network of 31 production facilities worldwide, and several dedicated R&D centres in 17 countries.

Recommendation: **HOLD**

Total Shareholder Return 9,16%

Price Target FY24: **108.26 €**

Dividend Yield 4,1 %

Price (as of 15-Dec-2023) **103.06 €**

Reuters: BMW.DE; Bloomberg: BMW GY

52-week range 82.70-113.46

Market Cap (€m) 59 753.741

Outstanding Shares as of 18Jul23 (m) 579.796

Source: Reuters; BMW website.



Source: Reuters

(Values in € millions)	2022	2023F	2024F
Core Revenues	142 609	153 682	158 872
Core Gross Profit	41 871	45 216	45 805
Core Gross margin	29,4%	29,4%	28,8%
Core EBITDA	24 899	24 525	24 042
Core EBITDA margin	17,5%	16,0%	15,1%
Automotive FCF ¹	6 146	2 407	2968
Motorcycle FCF	87	(48)	14
Financial Services FCF	9 640	3 673	4 674
Net Debt	41 078	40 015	40 714
CORE NOPLAT	10 894	10 232	9 589
Net Capex	4 201	5 345	5 612
NWC	12 546	13 142	13 989
R&D Expenses	6 624	7 222	7 832

Source: BMW Financial Reports and Own Estimates

¹ Excluding the effect of changes in PP&E and Intangible Assets arising on business combinations.

Table of Contents

COMPANY OVERVIEW	3
OPERATING SEGMENTATION	3
▪ <i>Automotive</i>	3
▪ <i>Motorcycle</i>	4
▪ <i>Financial Services</i>	5
GEOGRAPHIC SEGMENTATION.....	5
CORPORATE GOVERNANCE: MANAGEMENT AND SUPERVISORY BOARDS	5
OWNERSHIP STRUCTURE.....	6
BMW'S STRATEGY.....	7
BMW BRILLIANCE AUTOMOTIVE (BBA)	7
MACROECONOMIC AND AUTOMOTIVE SECTOR OUTLOOK	8
GLOBAL OUTLOOK	8
GERMANY	9
CHINA	10
USA.....	11
.....	12
STOCK PERFORMANCE	12
SWOT ANALYSIS	13
STRENGTHS.....	13
WEAKNESSES.....	13
OPPORTUNITIES	13
THREATS.....	14
COMPETITIVE LANDSCAPE.....	15
BENCHMARKING BMW AGAINST EUROPEAN AUTOMOTIVE GIANTS.....	15
BMW VS. ELECTRIC VEHICLE GIANTS.....	16
RELATIVE VALUATION.....	16
VALUATION.....	17
REVENUES FORECAST	17
▪ <i>Automotive</i>	17
▪ <i>Motorcycle</i>	19
▪ <i>Financial Services</i>	19
OPERATING SEGMENTATION.....	20
▪ <i>Industrial Segments</i>	20
▪ <i>Financial Services</i>	20
CAPITAL EXPENDITURE	21
NWC REQUIREMENTS	22
COST OF CAPITAL.....	22
▪ <i>Capital Structure</i>	22
▪ <i>Cost of Equity</i>	23
▪ <i>Cost of Debt</i>	23
▪ <i>WACC</i>	24
DISCOUNTED CASH FLOW (DCF).....	24
FREE CASH FLOW TO EQUITY (FCFE)	24
SENSITIVITY ANALYSIS	25
COMPARISON BETWEEN RELATIVE VALUATION AND VALUATION MODEL	26
FINAL RECOMMENDATION	26
APPENDIX	27

Company Overview

BMW's origins are intertwined with the names of Karl Rapp and Gustav Otto. The year 1916 saw the merger of Flugmaschinenfabrik Gustav Otto into Bayerische Flugzeug-Werke AG (BFW) a pioneering German aircraft producer. One year later, Rapp Motorenwerke transformed into Bayerische Motoren Werke GmbH, later becoming a public limited company (AG) in 1918. The crucial shift that gave origin to the group as we know it today, happened when BMW AG shifted its engine construction operations, along with its company and brand identities, to BFW, defining 1916 as the official inception year for the group.

The transfer occurred in 1922, during a period marked by the prohibition of aero-engine production in Germany after the war, which led to a shift in focus compelling BMW to explore other avenues. It was within this context that the company introduced its inaugural motorcycle model, the R32, in 1923, and eventually transitioned into automobile production in 1928.¹

Currently, the group operates globally in three main segments: Automobile, Motorcycle and Financial Services.

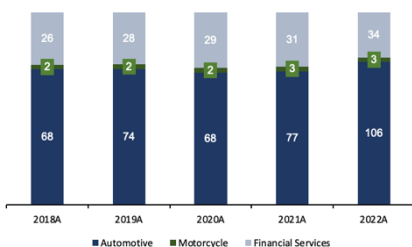
Operating segmentation

■ Automotive

The Automotive segment holds the highest significance within the group, accounting for more than 74% of the total sales volume in the fiscal year of 2022. This segment encompasses the production of the three car brands under the group's control, namely BMW, MINI, and Rolls-Royce.

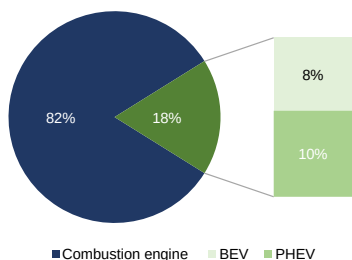
Within the segment, the BMW brand boasts an extensive line-up of vehicles, spanning from the premium compact to the luxury class. This range constitutes the predominant portion of cars sold, with over 2.1 million units delivered in 2022, comprising more than 87% of the group's total automotive sales. BMW embarked on its electric mobility journey as early as 2013, with the launch of the i3 and i8 series. This commitment was further solidified in 2020 with the introduction of several fully electric models. In 2022, the brand delivered a total of 172,008 Battery Electric Vehicles (BEVs) and 200,945 Plug-In Hybrid Vehicles (PHEVs), which corresponds to 8% and 9% of the brand's total deliveries, respectively.

Graph 1: BMW revenues by segment in billion €.



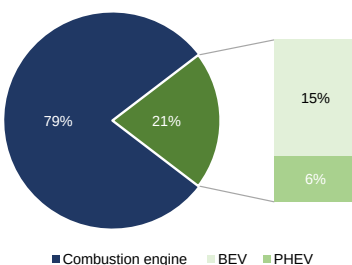
Source: BMW Financial Reports.

Graph 2: BMW deliveries by type of engine in 2022 (%).



Source: BMW Financial Reports.

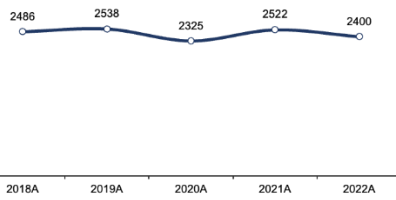
Graph 3: MINI deliveries by type of engine in 2022 (%).



Source: BMW Financial Reports.

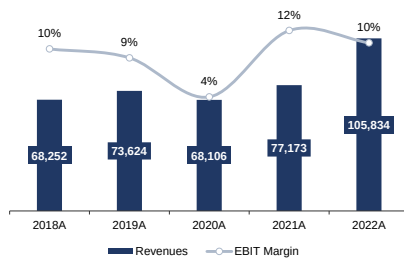
¹ BMW Group. BMW Group History. Accessed in December 2023.
<https://www.bmwgroup.com/en/company/history.html>

Graph 4: Automotive Segment: Deliveries (in 1000 units).



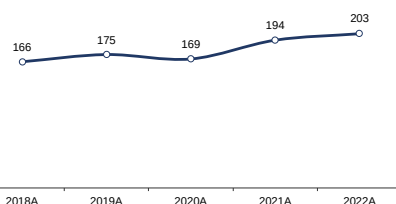
Source: BMW Financial Reports Source: BMW

Graph 5: Automotive Segment: Revenues (in million €) and EBIT Margin.



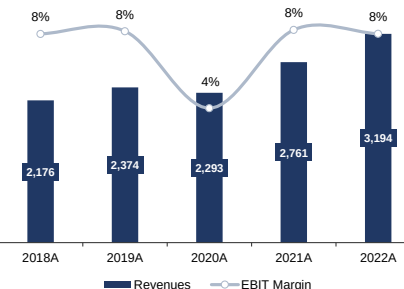
Source: BMW Financial Reports.

Graph 6: Motorcycle Segment: Deliveries (in 1000 units).



Source: BMW Financial Reports.

Graph 7: Motorcycle Segment: Revenues (in million €) and EBIT Margin.



Source: BMW Financial Reports.

In the premium compact segment, MINI is also actively embracing the shift towards electric mobility. The all-electric MINI Cooper SE emerged as the top-selling model within the brand's line-up in 2022. Overall, MINI delivered 292,922 vehicles in the last reported period. Notably, 15% of these were BEVs, while 8% were PHEVs. These figures highlight MINI's commitment to sustainable transportation and lay the foundation for the brand's ambitious goal of achieving 100% electrification by 2031.

The last automotive brand within the BMW group's portfolio is the epitome of ultra-luxury, Rolls-Royce. With an extensive global presence of over 150 dealerships, Rolls-Royce delivered 6,021 vehicles in the most recent reporting year. Furthermore, 2023 marked a significant moment for the prestigious British luxury brand, as it introduced its inaugural all-electric model, the SPECTRE.

Overall, the number of vehicles delivered has remained relatively consistent over the years. The company attributes this stability to the ongoing challenges posed by semiconductor component supply constraints and the impact of local lockdowns, especially in China. These factors have hindered the company's ability to meet the strong demand for vehicles. Despite this inertia in the volume of cars sold, the total sales value of the segment has consistently increased (except in 2020), with the EBIT margin remaining relatively stable and close to 10% (except in 2020).

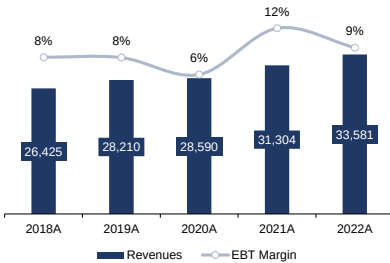
▪ Motorcycle

This segment comprises BMW Motorrad, which is an integral part of the company's historical heritage. The brand is focused on the premium segment of motorcycles and scooters with a wide range of models. Recently, the brand has been increasingly directing its focus towards electrification with the introduction of several new models, reinforcing the group's overarching commitment to the transition to electric mobility.

Within the group, this segment constitutes the smallest share of the total sales volume, generating approximately 3.2 billion € in revenue for the fiscal year of 2022. The segment's revenue has been steadily increasing over the past few years, maintaining a relatively constant EBIT margin of around 8%, except for 2020, when this margin reduced significantly. This sales outcome reflects the increasing number of deliveries that BMW Motorrad has been executing for the last few years in over 90 countries worldwide.

■ Financial Services

Graph 8: Financial Services Segment: Revenues (in million €) and EBT Margin.



Source: BMW Financial Reports.

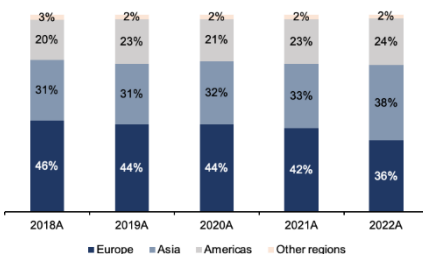
BMW Financial Services is a division within the BMW Group that specializes in providing a comprehensive array of financial products and services. It serves both individual and corporate customers within the automotive sector. The primary focus is on offering innovative financing, leasing, and insurance solutions designed to meet BMW customers' demands. Overall, the segment enhances accessibility to BMW vehicles while contributing to the company's global success in the automotive industry.

Financial Services' revenues accounted for more than 23% of the group's total revenues as of 2022, totalizing more than 33.5 billion €. The segment's sales have increased gradually throughout the period with the Pre-tax earnings margin throughout the period being moderately stable, going from 8.3% in 2018 to 9.4% in 2022. Much of this increase in sales, reflects the increase of sales for the industrial segment, consequently leading to an increase in the demand for financing and leasing contracts of BMW vehicles.

Geographic segmentation

Historically, Europe has stood as the most important market for BMW, where nations such as Germany and the UK accounted for 10.6% and 6.6%, respectively, of the automotive sales in 2022. Similarly, in the motorcycle sector, Germany, France, Italy, and Spain had a major contribution, representing 11.9%, 10.5%, 7.7%, and 6.2% of the group's sales, respectively. However, in recent years, there has been a surge in the group's presence in Asia, particularly in China, marking a significant shift in geographical revenue distribution. In 2022, Asia emerged as the region with the biggest contribution to the group's revenues for the first time.

Graph 9: Group revenues by region.



Source: BMW Financial Reports.

This shift reflects a broader and sustained trend of diminishing reliance on European markets for revenue, coupled with a significant growth in Asia, primarily driven by China, and in the Americas, with the USA representing around 82% of the region's revenues.

Corporate Governance: Management and Supervisory Boards

BMW follows the European corporate governance model, commonly known as the Continental or German model. This structure comprises a Supervisory Board and a Management Board.² The General Meeting of Shareholders (10 members) and the

² BMW Corporate Governance Code. Accessed in November 2023.

https://www.bmwgroup.com/content/dam/grpw/websites/bmwgroup_com/company/downloads/en/2018/CGC_BMW_A

Table 1: BMW Group Board of Management.

Board of Management	
Chairman	Olivier Zipse
Customer, Brands, Sales	Jochen Goller
People and Real Estate, Labour Relations Director	Ilika Horstmeier
Finance	Walter Mertl
Production	Dr Milan Nedeljković
Purchasing and Supplier Network	Dr Joachim Post
Development	Frank Weber

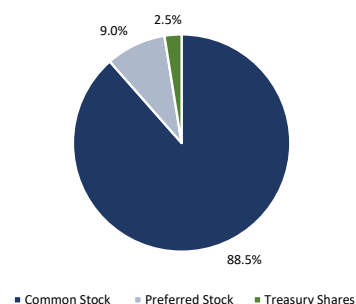
Source: BMW website.

employees (10 members) elect the Supervisory Board, adhering to the German Co-determination Act (Mitbestimmungsgesetz).³

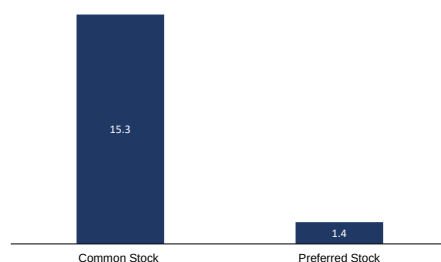
The board of managers is composed of 7 members, with Oliver Zipse being the Chairman since October 2019 and its members are appointed for 3 to 5 years. The board has suffered changes in 2023 with two new members entering it, Jachen Goller, responsible for Customer, Brands, and sales as well as Walter Mertl, who is responsible for the financial department.

The Supervisory Board is composed of 10 shareholder representatives elected by the AGM and 10 employee representatives elected by employees of BMW and other Group companies located in Germany, which is in line with the German Co-Determination Act according to which companies with more than 2000 employees need to have half the supervisory board being representatives of workers. Norbert Reithofer was elected the Chairman as of 2015 and the term will finish in 2025.

Ownership Structure

Graph 10: Shares issued on 31 December 2022.

Source: BMW Financial Reports.

Graph 11: Shares Repurchased during 2022 (in million shares).

Source: BMW Financial Reports.

Following Herbert Quandt's death in 1982, the majority owner at the time, his shares were divided between his son Stefan Quandt, holding 26.8% of BMW's stock as of November 2023 through his investment holding AQTON SE, and Susanne Klatten, Herbert's daughter, who owns 21.7% of the company via direct and indirect holdings. The outstanding 51.5% is split between the company's Treasury Shares (0.1%) and Free Float (51.4%). Institutional investors represent nearly a 23% stake in the company ordinary stock. Geographically wise, these investors are mostly located in Europe (50.7%) and North America (41.2%), with the 3 main countries of origin being the US (35.4%), the UK (20.5%) and Germany (13%). Asian investors own 5.8% of the company's shares with the remaining 2.3% being held by investors from the rest of the world.⁴

By the end of 2022, BMW's share capital amounted to € 662,839,475 (each share at a par value of 1€). It is subdivided into common stock, non-voting preferred stock, and Treasury Shares (more detailed explanation on this matter below), which account for 88.5%, 9% and 2.5% of the subscribed capital respectively.

Within the context of the Employee Share Programme for the financial year 2022, eligible BMW Group employees were granted non-voting shares of BMW AG preferred stock on preferential terms. The shares of preferred stock acquired through this program are subject to a vesting period of four years from the date of acquisition. In the reporting year, a total of 1,439,975 shares of preferred stock were transferred to employees. As of December 31, 2022, personnel expenses related to

³ German Corporate Governance Code. Accessed in November 2023. <https://www.dcgk.de/en/code.html>

the Employee Share Programme amounted to €23 million. The decision to continue the program is made annually by BMW AG's Board of Management.

At the Annual General Meeting of BMW AG on May 11, 2022, shareholders approved the inaugural implementation of a measure enabling the Board of Management to acquire treasury shares through the stock exchange.⁵ And for the first time, in 2022 the group repurchased 15,312,007 shares of common stock for € 1,172 million and 1,448,950 shares of preferred stock for € 106 million. The buyback authorisation is valid until 2027 and allows the BoM to acquire a maximum of 10% of the share capital.

BMW's Strategy

BMW's strategic vision revolves around a strong emphasis on electrification and a commitment to sustainable mobility. The company has set ambitious targets for the production and sales of electric vehicles (EVs), with models like the BMW i Vision Circular and BMW Vision Dee highlighting their dedication to exploring eco-friendly practices.

Focusing on constant innovation, BMW aims to introduce cutting-edge technologies that redefine the driving experience. The NEUE KLASS, anticipated in 2025, is positioned as a symbol of a new era in products, embodying BMW's vision of "Next Level Mobility." This commitment extends beyond features, encompassing autonomous driving capabilities and digital advancements aligning with consumer expectations.

Addressing geopolitical uncertainties, BMW adopts a "local for local" strategy to reduce dependencies by increasing localized production and enhancing supply chain resilience. The strategic expansion of battery electric vehicle (BEV) production across different locations reflects BMW's effort to navigate geopolitical complexities while maintaining efficiency and flexibility in response to market shifts. In a transformative move in their sales approach, BMW plans to introduce a direct sales model in Europe, starting with MINI in 2024 and expanding to BMW in 2026. This customer-centric approach aims to enhance the overall buying experience and bring the brand closer to consumers, showcasing BMW's commitment to staying ahead of industry trends and meeting evolving buyer expectations.

BMW Brilliance Automotive (BBA)

⁵ Annual General Meeting of BMW AG. Accessed in November 2023. <https://www.bmwgroup.com/en/investor-relations/annual-general-meetings.html>

BMW Brilliance Automotive Ltd. is a long-term joint venture established between the BMW Group and Brilliance Group on May 2003. For the last few years, this joint venture played an important role for the group's presence in China with its operations including R&D, procurement, production, sales, and after-sales services in China, the country that recently became the leading market in terms of automotive sales volume for the German group.⁶

On 11 February 2022, BMW Group increased its stake in the BMW Brilliance, becoming for the first-time, the controlling partner of the joint venture since its inception. This strategic acquisition created a strong impact on the consolidated financial statements of the group, due to the need of incorporating both the financial activity of the joint venture on the overall group income statement and the joint venture's assets and liabilities in the consolidated balance sheet.⁷

All these accounting adaptations significantly impacted several key sections of the consolidated financial statements. For instance, the Group's automotive revenues increased by 37%, while the corresponding cost of sales surged by 179% year-over-year, despite a decrease in the total number of car deliveries during the same period.

This impact is also evident in certain balance sheet items, such as Property, Plant, and Equipment, and Intangible Assets, which saw an increase of over €7.0 billion and €9.5 billion, respectively, as a direct result of the acquisition.

Macroeconomic and Automotive Sector Outlook

Global outlook

Over the past two decades, the automotive industry has observed distinct trends across different geographies. On the one hand, the more mature markets of Europe and USMCA (USA, Mexico and Canada) have displayed modest growth in terms of vehicle ownership. The annual sales figures have kept pace with population growth (stock of vehicles per capita grew at a CAGR of 1.3% in Europe and declined in the USMCA region at a CAGR of -0.1% since 2005)⁸.

Graph 12: YoY change in the stock of passenger cars per capita.



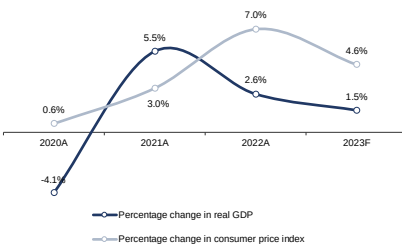
Source: The Economist Intelligence Unit (EIU).

⁶ BMW Brilliance. Company Introduction. Accessed in December 2023. <http://www.bmwbrilliance.cn/cn/en/pr/bba.html>

⁷ BMW Brilliance. Company Introduction. Accessed in December 2023. <http://www.bmwbrilliance.cn/cn/en/pr/bba.html>

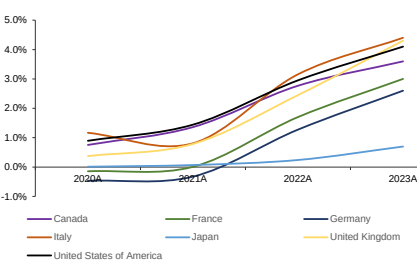
⁸ The Economist Intelligence Unit - Data Base

Graph 13: Developed Economies' macroeconomic indicators.



Source: The Economist Intelligence Unit (EIU).

Graph 14: Long-term bond yield (%) of G7 countries.



Source: Bank of Canada; Banca d'Italia; IMF, International Financial Statistics; Banque de France; Ministry of Finance Japan; European Central Bank; Bank of England.

On the other hand, markets of developing economies recorded a more robust surge in car ownership. The sales of new cars, on average, outpaced population growth, growing at a CAGR of 3.8% above the population growth in South America and 6.6% in the Asia-Pacific region⁹.

Focusing on the more recent years, the automotive industry has navigated through a complex and challenging economic scenery. In addition to the economic downturn, the onset of the COVID-19 pandemic has significantly disrupted the industry's supply chains, leading to widespread shortages in critical components and constraining production capacities.

In addition to the pandemic-induced challenges, geopolitical events also echoed across the automotive sector. Russia's invasion of Ukraine had a pronounced impact on the European energy market, sparking an energy crisis.¹⁰ The subsequent surge in energy prices along with geopolitical uncertainties inflicted additional cost pressures across industries, exacerbating inflation in the main developed economies. To address the inflationary concerns, central banks of these economies had to make crucial adjustments, in the form of successive interest rate hikes, transitioning towards a tighter monetary environment, which strikes a delicate balance between sustaining overall economic growth and mitigating the risk of undue acceleration in prices.

Despite all these challenges and the recent global decrease in sales, The Economist's industry report projects a positive trajectory for new car sales in the foreseeable future, with a forecasted CAGR of 3.8% growth for the period of 2023-2027. This recovery is expected to be propelled by the increasing popularity of the Electric Vehicles. This segment has already witnessed substantial growth in new vehicle registrations, boasting a CAGR of 87% in the Asia-Pacific region, 28% in Europe, an impressive 128% in South America, and 60% in the USMCA region since 2020. The substantial boost in electric vehicle adoption reflects a noteworthy shift in consumer preferences, indicating a pivotal influence on the future course of the global automotive market¹¹.

Germany

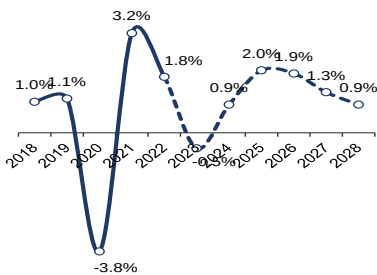
For decades, Germany's automotive sector has stood as a cornerstone of the nation's industrial scene. Positioned as the European leader in both the production

⁹ The Economist Intelligence Unit - Data Base

¹⁰ International Energy Agency. 2023. Russia's War on Ukraine. Accessed in October 2023. <https://www.iea.org/topics/russias-war-on-ukraine>

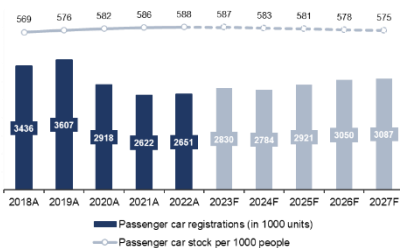
¹¹ Economist Intelligence Unit. Automotive: World.

Graph 15: Germany's real GDP growth (Annual percent change) -IMF forecast.



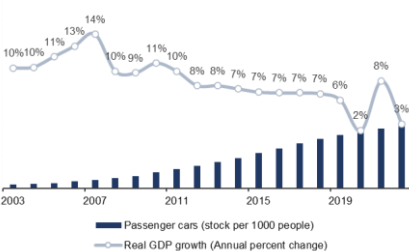
Source: IMF.

Graph 16: Passenger car registrations and passenger car stock per 1000 people.



Source: European Automobile Manufacturers' Association; World Bank - World Development Indicators; EIU.

Graph 17: China's real GDP growth (Annual percent change) and Stock per 1000 people of passenger cars.



Source: IMF; China Association of Automobile Manufacturers (CAAM); EIU.

and sales of automotive vehicles, Germany is currently the sixth largest vehicle producer, with one third of EU's production and 6% of the global production.¹²

Despite this historical dominance, recent years have witnessed profound structural transformations within the automotive industry, presenting significant challenges for European and particularly to German car manufacturers. The industry shift towards the electric vehicles coupled with a transition in emphasis from hardware to software as a mean of differentiation, has paved the way for new players from different geographies to capture market share on a global scale¹³. Germany living through a challenging macroeconomic environment further increases the pressure on car producers. Increasing energy costs, high inflation rates, and the geopolitical tensions stemming from the war in Ukraine contribute towards an environment where the country is anticipated to experience relatively modest economic growth. Regarding the domestic new-car sales, Germany has a mature market largely driven by replacement and cyclical demand, with one of the highest rates of car density in the EU and highly concentrated in German-branded cars (about 70% of market share). Chargeable EVs (BEVs and PHEVs) already represent a considerable stake in this market, with 31.4% of the sales in 2022. In the next few years, the number of vehicles sold in the country is expected to increase at a slow pace after the major reduction observed between 2019 and 2021.¹⁴

China

Since embarking on its economic reform in the late 1970s, China has undergone a profound and noteworthy transformation, marked by unparalleled economic growth. With an impressive average annual growth rate of 9% in terms of real GDP since 1980, China has ascended to the position of the world's second largest economy¹⁵, instigating substantial shifts in the nation's socioeconomic landscape. The impact is particularly evident in the automotive sector, for instance China's car ownership has witnessed a remarkable evolution. In the early 2000s, the country boasted a mere 10 vehicles per thousand people, a figure that has increased to 191 vehicles per thousand people by 2022. This drastic surge serves as a tangible

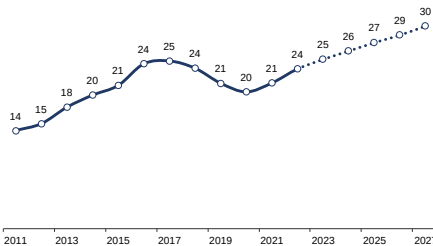
¹² Germany Trade and Investment (GTAI). (2023, June 25). Industry Overview: The Automotive Industry in Germany. <https://www.gtai.de/en/invest/service/publications/the-automotive-industry-in-germany-64580>

¹³ McKinsey. (2023, August 31). A Road Map for Europe's Automotive industry. Andres Cornet, Ruth Heuss, Patrick Schaufuss, Andreas Tschiesner.

¹⁴ Economist Intelligence Unit. Automotive: Germany.

¹⁵ Whiting, K. (2020, October 13). Chart of the Day: This is how the \$88 trillion global economy is spread around the world. World Economic Forum. Accessed in December 2023. <https://www.weforum.org/agenda/2020/10/global-economy-gdp-growth-covid-19/>

Graph 18: Passenger car registrations in China (in million units)



Source: China Association of Automobile Manufacturers (CAAM); EIU.

reflection of the evolving dynamics within Chinese households over the past two decades¹⁶.

In 2023, China's new-car market is estimated to build upon the sales recovery initiated in 2021. This optimistic outlook is primarily attributed to high savings rates and a surge in electric vehicle (EV) sales propelled by government subsidies. Although the market has yet to surpass the historical peak in sales volume recorded in 2017, projections from the Economist Intelligence Unit indicate a sustained growth path in the upcoming years, with an anticipated compound annual growth rate (CAGR) of 4.9% until 2027. This growth trajectory, strongly driven by the new-energy vehicles (Chinese classification for EVs), is anticipated to culminate in the sale of an estimated 30 million vehicles in the final year of the projection period¹⁷.

A unique feature of the Chinese automotive industry lies in its financing settings. In China, a considerable share of the car purchases is still funded through savings. This financial dynamic is influenced by China's high savings rate, that have further increased during the pandemic. While this high savings rate is expected to persist as a pillar supporting new-car demand, the share of cars purchased through loans is projected to increase¹⁸.

USA

Graph 19: Inflation rate, Average Consumer Prices.



Source: IMF.

In recent years, the world's largest economy¹⁹ has grappled with numerous economic challenges. The economic downturn induced by the COVID-19 pandemic was succeeded by a substantial surge in inflation rates, which marked a 20-year high in the annual percentage growth of average consumer prices in 2022. All these constraints lead the US economy to go through an unstable period of economic performance, with the forecasts indicating modest levels of growth for the next few years.

Regarding the Automotive sector, the USA is facing challenges due to the rapid shift to electric vehicles (EVs), rising input costs, and a prolonged strike by the United Auto Workers (UAW) against major Detroit-based car manufacturers.²⁰

¹⁶ International Organization of Motor Vehicle Manufacturers; World Bank – World Development Indicators; The Economist Intelligence Unit estimates

¹⁷ International Organization of Motor Vehicle Manufacturers; World Bank – World Development Indicators; The Economist Intelligence Unit estimates

¹⁸ Economist Intelligence Unit. Automotive: China.

¹⁹ Whiting, K. (2020, October 13). Chart of the Day: This is how the \$88 trillion global economy is spread around the world. World Economic Forum. Accessed in December 2023. <https://www.weforum.org/agenda/2020/10/global-economy-gdp-growth-covid-19/>

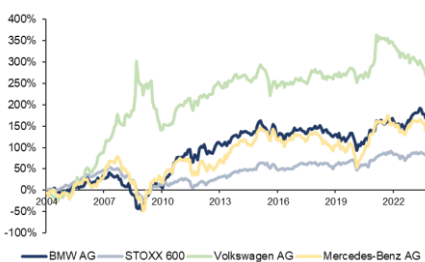
²⁰ Economist Intelligence Unit. Automotive: USA.

Conversely to other rich industrial countries, the US automotive market is shifting away from the traditional passenger cars toward Sports Utility Vehicles (SUVs) and Light trucks that are categorized as Light Commercial Vehicles. This market segment has a major importance within the national automotive context, representing the largest stake of the country's vehicle production.

Another major trend for the US Automotive industry is the current surge in the Electric Vehicles (EVs) sales. Although the negative trend in the overall passenger car segment, the proportion of EVs is becoming increasingly higher and the main growth driver to this specific segment in USA.

Stock Performance

Graph 20: BMW stock performance against Volkswagen, Mercedes and Stoxx 600.



Source: Reuters.

The automotive industry has witnessed significant fluctuations in recent decades, experiencing highs and lows. From 1996 to 2008, most automotive companies thrived, driven by global economic growth, increased consumer spending, and accessible financing due to low-interest rates. This period also marked notable technological advancements, including fuel-efficient models, improved safety features, and the popularity of SUVs and luxury vehicles.

The 2008 financial crisis disrupted this positive trend, causing a sharp decline in consumer spending, particularly on high-quality cars. The crisis led to a credit crunch, making it challenging for consumers to secure loans for vehicle purchases. Major players like General Motors and Chrysler faced financial distress, resulting in bankruptcy filings.

Post-crisis, governments intervened to revive the economy, introducing incentives like "Cash for Clunkers" to stimulate car purchases. The sector saw a robust recovery, with increased car sales justifying the strong performance until 2015.

However, in 2015, the landscape shifted significantly. The Volkswagen emission scandal and global trade tensions, particularly between the USA and China, disrupted supply chains and raised concerns about regulatory compliance and ethical practices in the automotive industry. Some regions experienced market saturation, slowing down the demand for new vehicles.

BMW's stock, valued at €14.1 in November 1996, showed consistent growth from 2003 to 2007, reaching €47.23 on December 10. The financial crisis led to a drop to €17.94 in November 2008, but an outstanding performance ensued until March 2015, peaking at an all-time high of €119.95. Subsequently, the stock fluctuated, reaching €95.38 in February 2022, and dropping to around €70 by September 2022. Similar to other automotive players, including Mercedes, BMW's stock increased until June 2023, followed by a decline.

To sum up, BMW's stock value fluctuations reflect the dynamic nature of the automotive market, encompassing periods of growth, challenges, and responses to global events.

SWOT Analysis

Strengths

BMW enjoys global acclaim for its prowess in luxury, performance, and engineering. Financially robust, the company boasts a sturdy balance sheet and consistently outperforms competitors in profitability metrics. BMW's unwavering commitment to innovation positions it at the forefront of market trends, particularly in areas such as autonomous driving and electric vehicles.

The brand's strength lies in its diverse product portfolio, encompassing coupes, sedans, and motorcycles, offering a comprehensive range that caters to a broad spectrum of customer preferences. Operating in more than 140 countries and with manufacturing facilities in 15 locations, BMW's expansive global presence underscores its adaptability and strategic localization initiatives.

Weaknesses

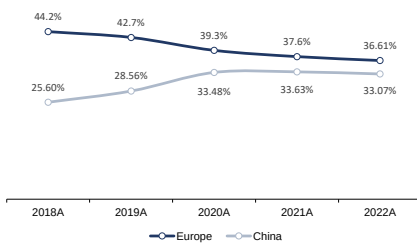
Despite notable strengths, the company faces critical weaknesses that necessitate attention. Primarily, its pricing, higher than many competitors, constrains market penetration in emerging economies. Furthermore, despite an increasing focus on electrified vehicles, reliance on traditional powertrains like diesel and gasoline exposes vulnerability to evolving environmental standards.

As the company pivots towards electric vehicles, competition intensifies. Tesla, a formidable contender, offers a range of luxury electric vehicles, challenging BMW's market position. Simultaneously, Chinese automakers such as BYD, SAIC-GM-Wuling Automobile, and Li Auto present a formidable challenge by providing more affordable electric vehicles with increasingly competitive features. This heightened competition extends to European rivals like Volkswagen, Stellantis, and Volvo, all intensifying their focus on electric vehicles.

Opportunities

Given BMW's strategic focus on electric vehicles (EVs) and its ambitious goal of achieving over 50% of total deliveries as all-electric vehicles, the company is poised to capitalize on the projected substantial growth in the global EV market.

Graph 21: Evolution of total deliveries in Europe and China (in million units)



Source: Own Estimates.

Projections for 2030 indicate that the EV market in China is expected to surpass an impressive \$500 billion, the USA is nearing the \$150 billion mark, and Europe is anticipated to exceed €100 billion.

This remarkable surge in the EV market provides BMW with a compelling opportunity to strengthen its position in the automotive industry. In 2018, 44.2% of BMW's total deliveries were made in Germany, with China accounting for 25.6% but worth noting changes have occurred ever since. As of 2022, the Chinese representative had risen to 33.07% while the European deliveries had fallen to 36.61%. This rise in China's importance for BMW paired with the expected substantial development in the Chinese automotive market definitely provide a unique opportunity for BMW to continue this path.

Threats

The expansion into the Chinese market and BMW's premium pricing strategy, while impactful, pose significant challenges. The luxury car market in China is increasingly saturated, with numerous manufacturers vying for a limited share. Chinese automakers, notably SAIC Motor and Geely, have gained prominence, with Chinese luxury car sales rising from 2% in 2015 to 12% in 2022, and projections foresee it exceeding 20% by 2030.

Adding complexity, 40% of Chinese luxury car buyers prioritize price, amplifying the challenge for BMW. Chinese manufacturers, benefitting from lower costs in steel and electronics, possess a competitive advantage. This intensifies BMW's task, particularly in a market where pricing is a critical factor.

Beyond China, BMW faces global threats due to supply chain disruptions. Driven by factors like the ongoing pandemic, geopolitical tensions, and natural disasters, these disruptions have inflated costs across the automotive industry. The semiconductor shortage alone resulted in a substantial loss of over 9.5 million units of light-vehicle production in 2021.

While automakers have implemented measures to manage current constraints, the growing demand for semiconductor technologies necessitates strategic preparations for future challenges in the supply chain. The dependence on semiconductors for modern vehicle components poses a significant risk, with disruptions potentially impacting production schedules and overall efficiency.

Additionally, rising raw material prices, especially for metals crucial in electric vehicle (EV) production, present concerns. Despite an expected return to pre-pandemic price levels in 2023, the spikes witnessed in 2021 and 2022 have escalated production costs for EVs. This is critical as BMW invests actively in

electric and hybrid vehicle technologies to meet market demands and regulatory requirements.

While costs are anticipated to decrease with technological advancements and economies of scale in EV production, short-term price spikes could impact production lines and profit margins. BMW must navigate these challenges proactively, considering not only immediate market conditions but also the long-term sustainability of its supply chain amidst unpredictable global events and market dynamics.

Competitive Landscape

Benchmarking BMW Against European Automotive Giants

Firstly, it is fundamental to assess BMW's competitiveness against the competitors in the most similar conditions. Hence, we decided to compare some of BMW's metrics with Mercedes, Volkswagen, and Stellantis, given their similarities regarding market cap and location, with their headquarters being located in Germany, except for Stellantis, located in the Netherlands. Revenues-wise, Volkswagen had the most revenues in 2022, totalizing € 279 thousand million, while BMW's revenues amounted to almost 106 thousand million euros. Regarding market cap, their similarities are even clearer, with Stellantis' capitalization being € 71,239 thousand million, followed by € 65,863 thousand million from Mercedes, with BMW in fourth place at 59,800 thousand million. Operational efficiency is another fundamental component when it comes to comparing companies, with EBITDA and EBIT being our chosen metrics. When it comes to the EBITDA margin, our estimate for BMW places it at 24.13%, being the most efficient out of these. For the EBIT margin BMW is the second highest, at 11.45%, after Mercedes' 12.27% value. Therefore, when it comes to the European automotive giants, BMW has shown to have strong operational efficiency. However, while profitability cannot be overlooked, it cannot be the only concern either, so a comparison regarding capital structure and liquidity provides a proper complement.

For liquidity, our estimate for BMW's current and quick ratio provides values of 1.09 and 0.86, respectively. It is the lowest current ratio among them, while the quick ratio is the biggest one, suggesting that the firm's liquidity situation is aligned with competition, having a slightly worse overall liquidity but being less dependent of its inventories in the event of a liquidity crisis. Relative to the capital structure, our estimated Debt/Assets is 34.93% and EBIT over interest expense is 18.31, indicating that the firm's indebtedness as a function of the value of assets is very

Table 2: BMW's profitability against European Competitors.

Profitability	BMW	Mercedes	Volkswagen	Stellantis
Market Cap	59.8 B€	65.9 B€	59.6 B€	71.2 B€
Revenues	105,834	150,000	279,200	179,600
EBITDA Margin	24.13%	16.60%	18.09%	14.92%
EBIT Margin	11.45%	12.27%	7.95%	11.14%

Source: Own Estimates; Bloomberg.

Table 3: BMW's Liquidity and Capital Structure compared with European competitors.

Liquidity & Capital Structure	BMW	Mercedes	Volkswagen	Stellantis
Current Ratio	1.09	1.20	1.20	1.30
Quick Ratio	0.86	0.80	0.80	0.80
Debt/Assets	34.93%	45.80%	35.40%	14.60%
EBIT/Total Interest Expense	18.31	50.10	20.10	19.60

Source: Own Estimates; Bloomberg.

similar to Volkswagen's, at 35.4%, with Mercedes presenting the highest value, 45.8%. With respect to EBIT's capacity to cover interest expenses, BMW has the worst value, at less than 40% of Mercedes value, indicating that despite the company's earnings before interest being enough to cover the interest expenses more than 18 times, it is a low value relative to the European competition.

BMW vs. Electric Vehicle Giants

Considering our prospects of the electric vehicles, it is crucial to evaluate BMW's competitiveness against some major EV players. We opted to compare BMW to Tesla, General Motors and Toyota as these are major players in the electrified cars sector.

Profitability-wise, BMW is only behind Tesla in terms of the EBIT margin, while it presents the highest EBITDA margin, 24.13% versus Tesla's 22.33%.

Concerning liquidity, the three competitors have a quick ratio of 0.9, with the German company presenting a very similar value. As to the current ratio, BMW has the lowest estimate among them, at 1.09, with Tesla being the clear first, with a ratio of 1.5.

Moving on to the capital structure, Debt/Assets and EBIT/Total interest expense will be compared between the four. BMW's indebtedness is the second lowest, with only Tesla coming in first, with an outstanding value of 7%. In terms of the capacity to pay the interest expenses using the EBIT, BMW has the third better capacity between them, with Tesla being able to repay its total interest expenses more than 71 times with its EBIT.

In summary, BMW's comparative analysis against both European automotive giants and prominent electric vehicle players portrays a company with commendable strengths in operational efficiency and strategic positioning. It is also important to mention that BMW cannot aim at replicating Tesla's performance given that the latter only produces electric vehicles. Nonetheless, BMW has a well-established position within the automotive industry both when compared to other European giants and to some of the biggest EV producers.

Relative Valuation

When assessing BMW's worth, we are using practical measures that complement the complex automotive industry with BMW's own situation. We are looking at key ratios like EV/EBITDA, EV/EBIT, and P/E. As BMW's peers, we chose Mercedes,

Table 4: BMW's profitability against EV references.

Profitability	BMW	Toyota	Tesla	General Motors
EBITDA Margin	24.13%	15.29%	22.33%	13.98%
EBIT Margin	11.45%	8.60%	16.81%	6.57%
Profit Margin	17.56%	9.90%	16.80%	7.40%

Source: Own Estimates; Bloomberg.

Table 5: BMW's Liquidity and Capital Structure compared with EV references.

Liquidity & Capital Structure	BMW	Toyota	Tesla	General Motors
Current Ratio	1.09	1.10	1.50	1.10
Quick Ratio	0.86	0.90	0.90	0.90
Debt/Assets	34.9%	40.10%	7.00%	43.80%
EBIT/Total Interest Expense	18.31	51.60	71.50	10.50

Source: Own Estimates; Bloomberg.

Stellantis, Porsche, Volkswagen, Volvo, Renault and Ferrari. Then, an average multiple was computed for each ratio, excluding outliers.

Firstly, we analysed the EV/EBITDA, with the average of the peers yielding a multiple of 2.80x. Then, by multiplying the multiple by our estimated EBITDA and adjusting for our estimated Net Debt of € 41,078 million we achieved a share price of € 94.2.

Secondly, we proceeded similarly for the EV/EBIT multiple. This time, the multiple arising from the average of the peers without the outliers was 4.58x. Considering our estimated EBIT of € 25,842 million, our computed Net Debt, and an amount of nearly 587 million common stock shares outstanding, the resulting share price was € 131.7.

Thirdly, the multiple for the P/E ratio obtained was 4.6x. Considering a BMW basic EPS of € 27.31 and multiplying it by the multiple the estimated share price lies at the € 125.6 mark.

As we are comparing companies with different capital structures, we decided to give importance to the EV/EBITDA ratio given that it is less sensitive to variations in capital structure as it excludes interest, taxes and non-cash items such as depreciation and amortization. Nonetheless, as the automotive industry is capital intensive, and depreciation represents a significant portion of capex, we also consider the EV/EBIT approach to be suitable. Therefore, we believe that the BMW share price should be traded at a range close to the average of both methods, between € 105.96 and € 119.96.

Valuation

Revenues Forecast

BMW Group's operations are divided in three core segments (Automotive, Motorcycle and Financial Services), each characterized by distinct market conditions, growth drivers and geographic segmentation. Therefore, and due to the independent nature of the three segments, the projection of the group's revenues is delineated accordingly.

■ Automotive

As previously detailed in the Company Overview chapter, the Automotive segment represents the largest stake of Revenues, which comprises the sales of the three brands under the group's control.

Table 6: EV/EBITDA.

EV/EBITDA	94.2
Multiple	2.80
EBITDA	34,408
EV	96,342

Source: Own Estimates; Bloomberg.

Table 7: EV/EBIT.

EV/EBIT	131.7
Multiple	4.58
EBIT	25,842
EV	118,356
Equity Value	77,278

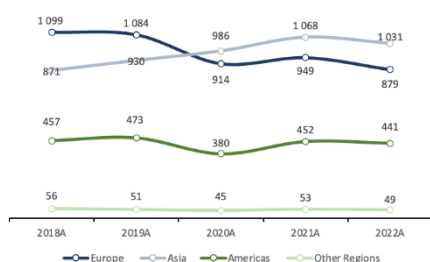
Source: Own Estimates; Bloomberg.

Table 8: P/E.

P/E	125.6
Multiple	4.60
Basic EPS	27

Source: Own Estimates; Bloomberg.

Graph 22: Total car deliveries by region in thousand units.



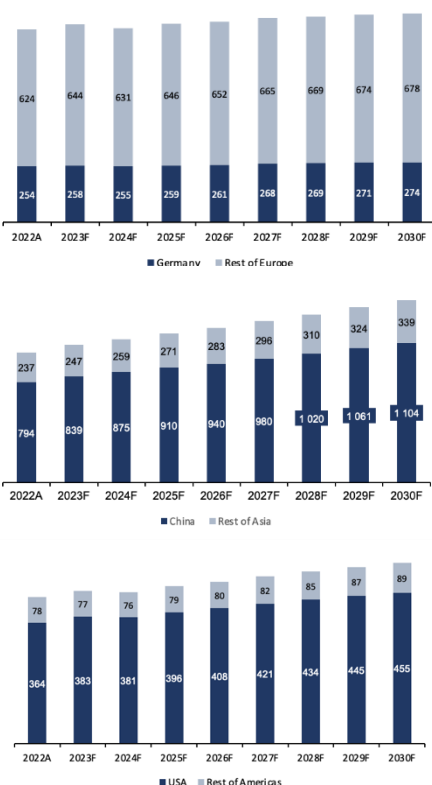
Source: BMW Financial Reports.

Historically, the group's automotive sales are more concentrated in developed markets as Germany and USA, with the European and American continents representing 46.2% and 20.2%, respectively in 2018. This geographic segmentation is a clear reflection of the market segment where BMW, MINI and Rolls-Royce are integrated. However, due to the fast development of Asian economies, with a particular emphasis on China, this region is becoming increasingly more relevant for the group's car sales. In a notable shift, China emerged as the largest country in terms of vehicles delivered by the three car brands in 2021, surpassing the USA for the first time.

Given the distinctive characteristics of each region where BMW operates as well as the dimension of the revenues in each country/region, the forecast model is set to project automotive revenues in 7 different regions - Germany, Rest of Europe, China, Rest of Asia, USA, Rest of Americas, and Others. In each region, we consider three fundamental drivers for the increase of deliveries. Firstly, we account for the real GDP growth (IMF projections) to reflect the region's expected overall evolution in terms of purchasing power as well as its economic development in the foreseeable future. Then we consider the projections of car registrations in each of the analysed regions, drawing upon the forecast of specialised local institutions as the "Association des Constructeur Européens d'Autos" for European countries, "China Association of Automobile Manufacturers" and the US "Bureau of Economic Analysis", which reflects the future overall market trends in the automotive sector. Lastly, we considered the group's historic evolution of deliveries in each region, in order to account for the company local positioning and the current market trends.

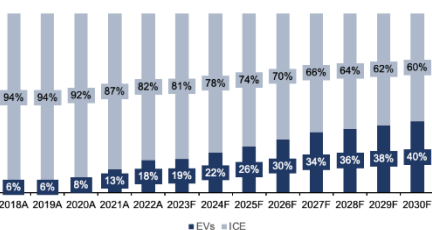
The automotive industry is undergoing a transformative period, where established market leaders and numerous international newcomers are competing for a prominent position in the Electric Vehicle segment. With growing concerns about CO2 emissions and global government initiatives promoting the shift towards electric alternatives over traditional Internal Combustion Engine (ICE) vehicles, we anticipate that the adoption of Electric Vehicles (EVs) will persist as the predominant trend in the automotive sector. Therefore, in the revenue forecast model, we incorporate local projections concerning future EV sales as a percentage of total car sales. This consideration influences the Average Revenue per Unit sold (ARPU), given that this segment is still priced above the traditional ICE vehicles. To estimate the "EV premium", we compared the market prices practiced in Portugal of several ICE models and their EV equivalent, reaching an estimated 19.1% markup for the electric configurations. As these technologies keep evolving and the segment becomes more saturated, we estimate that this

Graph 23: Forecast of total deliveries in Europe, Asia, and Americas (in thousand units).



Source: Own Estimates.

Graph 24: Forecast of car sales by type of engine.



Source: Own Estimates.

premium will reduce over the long term, such that the model projects the ARPU to grow at the expected long-term inflation.

▪ Motorcycle

The Motorcycle segment includes BMW Motorrad, the group's brand exclusively focused on manufacturing premium motorcycles and scooters. Despite embodying BMW's historical heritage and consistently delivering robust financial performances, the motorcycle business unit remains the smallest in terms of revenues for the German group, with around 2% of the total revenues.

Aligned with the Automotive segment model, the Motorcycle revenue forecast model is geographically divided, with a particular focus on the seven largest markets for BMW Motorrad in terms of total deliveries – Germany, France, Italy, USA, China, Spain, and Brazil.

Regarding the forecast for the motorcycle deliveries by region, the model accounts for two main drivers. Firstly, and as in the Automotive segment, we consider the IMF projections for the real GDP growth reflecting the expected economic development of each country. Additionally, to address specifically the overall motorcycle segment in each country, we use The Economist Intelligence Unit projections for the change in market demand for “Motor Vehicles and parts”.

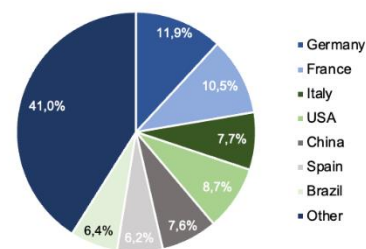
Lastly, to define the annual change in the Average Revenue per Unit sold (ARPU) by geography we considered IMF projections for the inflation in each country for the foreseeable future.

▪ Financial Services

In addition to the Automotive and Motorcycle segment, BMW group also provides financial services focused in the automotive sector, through credit financing and leasing of vehicles from the group brands both for retail and large business clients. As of 2022, this was the second largest segment for the overall revenues of the German group, with Revenues amounting to 33.6 billion € in the last reported year (around 24% of BMW revenue).

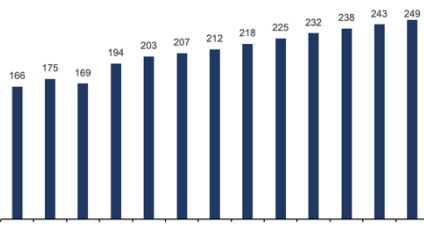
As a supplementary service offered by the group, the Financial Services segment's revenue is closely tied to the other operating activities, mainly the number of vehicles delivered by the company on an annual basis. Therefore, the projected revenues for the segment have the number of automotive vehicles delivered by region each year as the main revenue growth driver.

Graph 25: BMW Motorrad deliveries by region in 2022.



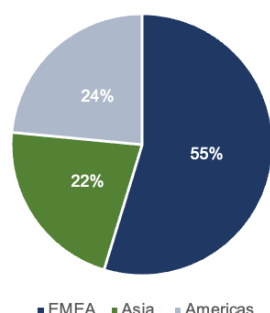
Source: BMW Financial Reports.

Graph 26: Total deliveries forecast – Motorcycle segment.



Source: BMW Financial Reports; Own Estimates.

Graph 27: Total Number of Contracts under management by region in 2022



Source: BMW Financial Reports

Firstly, we started by analysing the composition of the group's total number of credit financing and leasing contracts under management by geography. EMEA region has the largest stake in contracts under management, followed by Americas and lastly the Asia region. This composition reflects the different consumer behaviours from each region, for instance when comparing China's stake on the the number of cars delivered in 2022 (around 33% of the total annual deliveries), with the percentage of financing contracts from Chinese customers (13.5% of the contracts under BMW group's financial services management), one can notice that the a considerable share of the car purchases is still funded through savings, conversely to the European region.

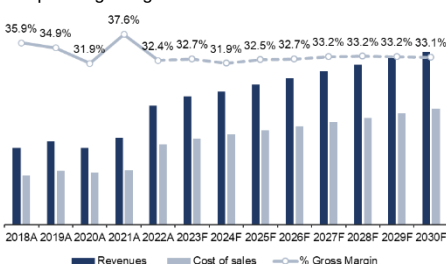
Regarding the forecasted number of financing contracts under management, we used the projected growth of automotive vehicles as the main driver for determining the future portfolio of contracts.

Lastly, to determine the average revenue generated by each contract we determined the historical value, and then projected this amount to increase at the same rate as the average ARPU from the automotive segment within the respective region.

Operating Segmentation

Industrial Segments

Graph 28: Forecast of the Automotive Segment Operating Margin.



Source: Own Estimates.

Graph 29: Forecast of the Motorcycle Segment Operating Margin



Source: Own Estimates.

Operating margins exhibited a pronounced response to the Covid-19 pandemic, experiencing a significant decline in 2020 followed by a robust rebound in 2021. Anticipating a long-term trajectory, we project the margins to achieve stability and approach levels reminiscent of the pre-pandemic period.

The cost of sales of the two industrial segments (Automotive and Motorcycle) are separated between manufacturing costs and all the other costs associated with the goods sold and services provided by the respective segment.

The manufacturing costs are projected to grow in line with the inflation of the countries where the company has production plants, reflecting the expected dynamic of changes in the price of materials and salaries for the long-term in such regions.

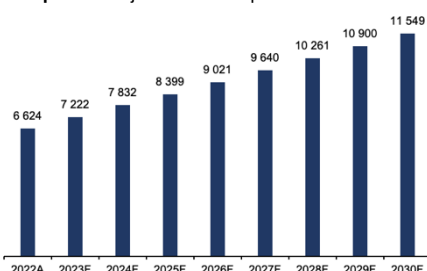
The remaining costs are forecasted by applying a consistent percentage of total revenues, thereby capturing the proportional escalation of costs in relation to the overall growth of the enterprise.

Financial Services

Due to the operating nature of the segment, interest expenses represent a significant portion of Financial Services operating costs. With the current macroeconomic environment of high interest rates, we expect the cost of sales of the segment to increase accordingly. The remaining costs of sales are projected to increase in line the revenues, once again reflecting the overall growth of the enterprise.

Research and Development Expenses

Graph 30: Projected R&D expenses.



Source: BMW Financial Reports; Own Estimates.

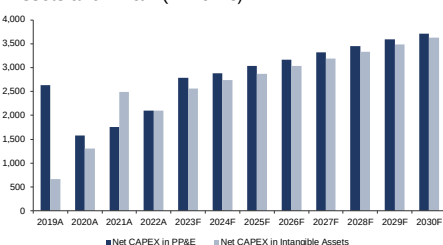
The transition to Electric mobility created a significant challenge to long-standing automotive manufacturers accustomed to operating in a mature industry. The need to embrace and develop disruptive technologies, coupled with the emergence of several new competitors from different geographies, has been pressuring traditional automotive producers as BMW to swiftly adapt to the dynamic shifts in market conditions.

Therefore, we expect that the expenditure in R&D will keep increasing for BMW to face the current market challenges concerning the surge of such a transformative transition in the automotive industry.

The two drivers for the increase of R&D expenses are the average of the projected inflation for the countries where BMW has research and development centres and the forecasted automotive deliveries growth in the following year, implying the need of such investment to be able to keep appealing within a more competitive context.

Capital Expenditure

Graph 31: Projected Net Capex in Intangible Assets and PP&E (million €)



Source: BMW Financial Reports; Own Estimates.

As described in the “BMW Brilliance Automotive (BBA)” section, the acquisition of a majority stake in BBA created a major impact in the Group’s Property, Plant and Equipment (PP&E) as well as in its Intangible Assets.

From January 1st of 2022 until December 31st of 2022, the group’s net PP&E grew from 22,390 million € to 32,126 million €, an increase of 9,736 million €. These changes can be explained by the additions arising from business combination (7,072 million €), Net Capex (2,101 million €), Depreciation and Amortisation (-4,827 million €) and other changes in PP&E (5,556 million €).

Regarding the forecast for the future amount of capex in PP&E we considered a fixed percentage of revenues as the main driver for the additions of this type of assets in the future, assuming the continuous need of high-end equipment and infrastructures necessary to increase the vehicles production.

To determine the amount of PP&E disposed yearly, we analysed the correlation between the historical values of disposed PP&E and its new additions, assuming a consistent proportionality (aligned with the historical trends), to estimate the future annual disposition of PP&E.

As well as for the fixed assets, the net value of Intangibles asserts within the balance sheet increased sharply from 2021 to 2022 due to the impact of BBA. To forecast the future net capex in this type of assets we started by separating the total amount of Intangible assets in 3 main categories: Capitalised development costs, Goodwill and other.

The increase of Capitalised development costs is dependent on the R&D investments (more details in the previous section), by considering that a constant percentage (aligned with the historical figures) of the overall R&D expenditure will be allocated to Capitalised development costs.

Goodwill has remained consistent over the years, with the only change occurring in 2022, primarily due to the acquisition of the majority stake in BBA. Consequently, we have considered a constant amount for this category in the long term.

Lastly, Other Intangible Assets were projected to grow as a steady percentage of the company's revenues.

NWC Requirements

Table 9: Average Holding Period, Average Collection Period and Average Payable Period.

	2018A	2019A	2020A	2021A	2022A
Automotive Segment					
Average Holding Period (# days)	109	110	105	113	95
Average Collection Period (# days)	12	11	11	10	13
Average Payable Period	70	67	58	73	65
Automotive Segment					
Average Holding Period (# days)	126	136	136	111	115
Average Collection Period (# days)	28	29	35	12	16
Average Payable Period (# days)	77	83	75	64	71
Financial Services Segment					
Average Holding Period (# days)	11	13	13	6	7
Average Collection Period (# days)	1	1	1	1	1
Average Payable Period (# days)	17	15	14	13	12

Source: BMW Financial Reports; Own Estimates.

To determine an appropriate projection for the three different segments concerning its Net working capital requirements we considered an average number of days for Inventories, Trade Payables and Trade Receivable.

In the context of Inventories, we predicted the Average Holding Period in terms of the number of days for each segment. For Trade Payables and Receivables, we projected the future Average Payable and Collection Periods, respectively, for each segment. These forecasts were made by considering the firm's historical figures related to the specific financial captions.

Regarding the Operating Cash, we forecasted this amount to be 2% of the segment's annual revenue, since it's traditionally considered an appropriated proxy of the cash needed, on average, to run the core business of a firm²¹.

Cost of Capital

▪ Capital Structure

²¹ T. Opler, et al. 1999. "The Determinants and Implications of Corporate Cash Holdings", Journal of Financial Economics 52 (1): 3–46

Table 10: Historical Capital Structure.

	2018	2019	2020	2021	2022
Assets	208,938	228,034	216,658	229,527	246,926
Liabilities	151,109	168,127	155,138	154,395	155,638
Equity	57,244	59,267	60,833	74,307	88,327
Invested Capital	97,466	113,778	107,431	110,216	121,855
EBITDA	17,008	15,655	13,550	24,412	34,408
Net Debt	50,265	62,320	52,598	47,167	41,078

Source: BMW Financial Reports; Own Estimates.

Table 11: Historical Capital Structure Ratios.

	2018	2019	2020	2021	2022
Gearing ratio	0.52	0.55	0.49	0.43	0.34
Debt to Equity ratio	0.88	1.05	0.86	0.63	0.47
Debt to EBITDA	2.96	3.98	3.88	1.93	1.19
Solvency ratio	0.38	0.35	0.39	0.48	0.57
Financial Autonomy ratio	0.27	0.26	0.28	0.32	0.36

Source: BMW Financial Reports; Own Estimates.

In recent years, BMW has seen its assets growing substantially, with its liabilities growing at a much slower pace. This trend is verified except for the year of 2019 when liabilities increased sharply, nonetheless by 2020 the values normalized. Between 2018 and 2022 the group's assets have increased 18.2% while liabilities only increased 3%, resulting in a substantial decrease of the Debt-to-Equity ratio, from 0.88 to 0.47.

Invested Capital has also grown throughout the analysed period, growing 25.02% and EBITDA has increased even more, 102.3%, going from € 17,008 million to € 34,408 million. As a result, both the Solvency and the Financial Autonomy ratios increased, to 0.57 and 0.36, respectively, compared with their initial values of 0.38 and 0.27.

Naturally, the Debt-to-EBITDA and the Gearing ratio moved on the opposite direction, from 2.96 and 0.52 to 1.19 and 0.34, respectively, illustrating the decrease in the company's indebtedness for this interval. We believe that BMW will target its Debt-to-Equity ratio of around 42% going forward.

■ Cost of Equity

Table 12: Cost of Equity Computation.

Annual return Stoxx 600	10.63%
Average Unlevered Beta	0.93
Levered Beta	1.20
Market Risk Premium	8.31%
Cost of Equity (re)	12.30%

Source: Yahoo Finance; Own Estimates.

Given that 50.7% of BMW's investors are European, we treated its marginal investor as being European. Therefore, we used the STOXX Europe 600 index as market portfolio, against which we regressed Porsche, Mercedes, Volkswagen, and Volvo's historical prices to compute the levered beta, then unlevered based on each company's capital structure, and using the corporate tax rate according to the company's headquarter location.

To determine the cost of equity, we have used the CAPM. Firstly, we get the average unlevered beta for BMW's peers, obtaining a value of 0.93. Then, we lever the beta based on BMW's capital structure and corporate tax rate, getting to a levered beta of 1.20. For the risk-free rate, we defined the 10-year German bond as its proxy and we considered an expected risk premium of 8.31%, which is by how much Stoxx Europe 600 return exceeds the risk-free rate.

■ Cost of Debt

Table 13: Cost of Debt Computation.

Last price	100.36%
Discounted cash outflows	100.36%
Implied interest rate	3.19%
Amount outstanding in €	500,000,000
Coupon Rate	3.25%
Probability of default	0.33%
Recovery rate	60.00%
Cost of debt	2.99%

Source: Moody's; Own Estimates.

To estimate BMW's cost of debt, we considered a BMW corporate bond maturing in 2030, with a principal of € 500 m. We then computed the implied interest rate of the bond using its last price, estimating an implied cost of debt of 3.19%. Then, considering a probability of default of 0.33% and a recovery rate of 60%, we obtained a cost of debt of 2.99%.

Table 14: WACC Computation.

WACC Estimation	
10 Year Bundesanleihen rate	2.32%
Expected Equity Market Return	10.63%
Market Risk Premium	8.31%
β	1.20
Cost of Equity (re)	12.30%
Cost of Debt (rd)	2.99%
ND/(ND+E)	42.44%
Corporate tax	30.90%
re	12.30%
E/(ND+E)	57.56%
WACC	8.35%

Source: Own Estimates.

▪ WACC

We considered the German corporate tax rate as the corporate tax rate, hence using a value of 30.9%. From 2023 onwards we consider that the equity-to-enterprise value ratio remains constant at 57.56%, given our assumption that the company will have its debt-to-equity ratio of 2022 as the target ratio. By doing so, we estimated a weighted average cost of capital of 8.35%.

Discounted Cash Flow (DCF)

Considering the clear division between the industrial segment, composed of the automotive segment and motorcycles, and financial services, we decided to evaluate the industrial segment via DCF and the latter via Free Cash Flow to Equity (FCFE), given that it is more appropriate to evaluate financial services than the standard DCF.

Firstly, we discount the future unlevered operating FCFs at the WACC to obtain their present value. Secondly, to obtain the terminal value, we consider the final growth of the FCFs to be the terminal growth of the FCFs, given that a stable growth rate was attained. Finally, the Enterprise Value for the industrial segment is obtained by summing the present value of the unlevered FCFs with the present value of the terminal value.

Free Cash flow to Equity (FCFE)

To perform a valuation of a company or a business unit within a company, the most commonly used method is the Discounted Cash Flow Model. The DCF model consists of discounting the Free Cash Flows to Equity and Debt investors, determining the Enterprise value of the firm. However, in the case of financial services providers, the most appropriate way of performing a valuation is using the cash flow to equity model.²²

As in a traditional bank, operating and financial decisions cannot be separated, given that both the interest expenses and income are considered part of the core operations of the financial services segment. Thus, to value this business unit, conversely to what we did for the Automotive and Motorcycle segments, we computed the free cash flows to equity, by considering the interest expenses and

²² Koller, Goedhart and David Wessels. 2015. *Valuation: Measuring and Managing the Value of Companies*. McKinsey & Co.

the correspondent tax shield. The Equity value is then determined by discounting the free cash flows to equity directly by the cost of equity, instead of WACC.²³

Sensitivity Analysis

We performed three separate sensitivity analysis, with the first one aiming at measuring the impact of variation in the WACC and industry's terminal growth rate on the industrial segment's enterprise value. The second one's goal was to identify the changes in financial services' equity value as a result of changing the cost of equity and the terminal growth rate of the financial services sector. The ladder was computed to assess how susceptible to changes in the after-tax cost of debt.

Table 15: Industrial Segment's EV Sensitivity Analysis.

		WACC				
		7.35%	7.85%	8.35%	8.85%	9.35%
Growth rate	0.50%	71,965	67,417	63,485	60,058	57,048
	1.00%	76,050	70,865	66,425	62,587	59,241
	1.50%	80,834	74,856	69,794	65,460	61,713
	2.00%	86,512	79,530	73,694	68,753	64,521
	2.50%	93,360	85,077	78,261	72,564	67,739

Source: Own Estimates.

Table 16: Financial Services Sensitivity Analysis.

		Cost of Equity				
		11.30%	11.80%	12.30%	12.80%	13.30%
Growth rate	0.76%	25,895	24,941	24,079	23,298	22,588
	1.26%	26,639	25,602	24,669	23,828	23,065
	1.76%	27,461	26,329	25,316	24,405	23,583
	2.26%	28,374	27,133	26,028	25,038	24,148
	2.76%	29,394	28,026	26,814	25,734	24,767

Source: Own Estimates.

Concerning the Enterprise Value of the Industrial Segment, its value with the defined WACC of 8.35% and the terminal growth rate of 1.50% lies at € 79,794 million, with the impact of WACC and growth rate being measured up to a percentage point change in their values, upside, or downside. For the estimated WACC, the EV varies between € 63,485 million and € 78,281 million for a terminal growth of 0.50% and 2.50% respectively. On the other hand, by fixing the growth rate at the estimate of 1.50%, the enterprise value changes between € 61,713 million and € 80,834 million for a WACC of 9.35% and 7.35%, respectively.

With regards to the Equity Value of Financial Services, for a cost of equity of 12.30% and a terminal growth rate of 1.76% yield an Equity Value of € 25,316 million. *Ceteris paribus*, an equity cost of 13.30% would lead to an Equity Value of € 23,582.7 million while for a cost of equity of 11.30% the Equity Value would increase to € 27,461 million. Contrarily, by fixing the cost of equity and changing the growth rate a percentage point upwards and downwards changes in Equity Value to € 26,814 million and € 24,079 million.

Table 17: WACC Sensitivity Analysis.

		After-tax cost of debt				
		1.99%	2.49%	2.99%	3.49%	3.99%
Beta	1.00	6.97%	7.18%	7.39%	7.60%	7.81%
	1.10	7.44%	7.66%	7.87%	8.08%	8.29%
	1.20	7.92%	8.13%	8.35%	8.56%	8.77%
	1.30	8.40%	8.61%	8.83%	9.04%	9.25%
	1.40	8.88%	9.09%	9.30%	9.52%	9.73%

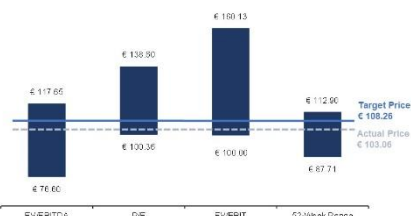
Source: Own Estimates.

As for the WACC, it was computed with an after-tax cost of debt of 2.99% and a Beta of 1.20. In terms of cost of debt, if it were to be a percentage point higher than its value, the WACC would have increased 0.42 percentage points, to 8.77% for the same beta, while a percentage point decrease in the cost of debt would lead to a WACC of 7.92%. In terms of changes in the beta, a decrease in the Beta from 1.20 to 1.00 would decrease the WACC by almost 1 percentage point, to 7.39%, while an increase to 1.40 would increase it to 9.30%.

²³ $\text{Equity Value} = \sum_{t=1}^{\infty} \frac{CFE_t}{(1+re)^t}$

Comparison between Relative Valuation and Valuation Model

Table 18: Relative Valuation Metrics.



Source: Reuters; Own Estimates.

We have obtained the highs and lows for a few metrics to assess if our estimate was aligned with them. According to the EV/EBITDA multiple, the share price falls within the range of € 76.60 to € 117.65, with the P/E multiple share price leading to a low price of € 100.36 and a high price of € 138.60. EV/EBIT leads to a low price of € 100.00 and a high price of € 160.13. Within the last 52 weeks before December the 15th, BMW's lowest share price was 87.71€, while its highest value was € 112.90, with the share price as of December 15th being € 103.06. Considering our valuation led to a share price of € 108.26, we assess our estimate lies within market metrics.

Final Recommendation

Table 19: Valuation Summary.

Assumptions	
WACC	8.35%
Perpetuity growth (Industrial Segment)	1.5%
Cost of Equity	12.30%
Perpetuity growth (Financial Services Segment)	1.8%
Valuation	
Enterprise Value (Industrial Segment)	69,795
Net Debt	(40,732)
Non-core (Book Value)	8,393
Equity Value (Financial Services Segment)	25,312
Total Equity Value (million €)	62,769
Shares Outstanding (million)	580
Price per share (31 Dec. 2024)	€ 108.26
Price per share	€ 103.06
Transactions with Shareholders (2024)	2,456
Dividend Yield	4.1%
Total Shareholder Return	9.16%
Recommendation	Hold

Source: Own Estimates.

Supported by the results of our valuation model, we expect the stock of BMW AG to be traded at 108.26€ on December 31st, 2024. The computation of the final price results as a sum of parts, with each segment amounting the correspondent equity value to the overall group's equity value. Additionally, we add the value of the non-core business as its book value in the last day of 2024. Therefore, considering the current market price of 103.06€ per share (15 Dec 2023) and a forecasted dividend yield of 4.1%, we expect a total shareholder return of 9.16%, corresponding to a HOLD final recommendation.

Appendix

Financial Statements

Balance Sheet

Fiscal year ending 31 Dec (in € million)	Forecasted BS - BMW Group									
	2021A	2022A	2023F	2024F	2025F	2026F	2027F	2028F	2029F	2030F
Core business										
Industrial segment										
Automotive										
Operating cash	1 543	2 117	2 279	2 360	2 490	2 602	2 732	2 845	2 961	3 076
Inventories	14 868	18 679	20 323	21 612	22 892	24 181	25 560	26 971	28 455	30 006
Trade receivables	2 076	3 869	3 562	3 688	3 891	4 066	4 270	4 446	4 627	4 807
Trade payables	(9 650)	(12 763)	(13 997)	(14 674)	(15 327)	(15 968)	(16 650)	(17 334)	(18 047)	(18 783)
Current tax	(400)	(339)	(376)	(400)	(434)	(466)	(503)	(537)	(573)	(610)
NWC	8 437	11 563	11 791	12 584	13 512	14 415	15 409	16 390	17 423	18 496
Intangible assets	12 438	21 220	21 012	20 762	20 371	19 869	19 224	18 419	17 441	16 277
PP&E	21 885	31 514	33 305	35 135	37 153	39 291	41 594	43 991	46 484	49 037
Other assets, net of other liabilities	(3 311)	(5 229)	(5 150)	(5 331)	(5 626)	(5 878)	(6 173)	(6 427)	(6 689)	(6 950)
Provisions	(7 213)	(9 207)	(9 994)	(10 429)	(11 092)	(11 681)	(12 362)	(13 014)	(13 633)	(14 353)
Deferred tax	1 408	337	2 112	2 186	2 307	2 410	2 531	2 635	2 743	2 850
Core Invested Capital	33 645	50 198	53 077	54 907	56 625	58 425	60 224	61 995	63 768	65 358
Motorcycle										
Operating cash	55	64	68	71	75	79	83	87	91	95
Inventories	656	802	927	969	1 006	1 048	1 086	1 144	1 189	1 237
Trade receivables	91	143	161	179	198	219	241	263	287	312
Trade payables	(378)	(494)	(568)	(591)	(611)	(633)	(654)	(686)	(709)	(734)
NWC	424	515	587	628	668	713	757	809	857	909
Intangible assets	167	185	192	202	213	225	236	247	257	269
PP&E	438	491	519	547	579	612	648	685	724	764
Other assets, net of other liabilities	(109)	(171)	(179)	(186)	(194)	(202)	(209)	(215)	(222)	(228)
Provisions	(219)	(206)	(223)	(240)	(258)	(277)	(297)	(316)	(336)	(357)
Core Invested Capital	701	814	896	951	1 008	1 071	1 135	1 210	1 281	1 356
Financial Services										
Operating cash	626	672	727	746	784	816	853	882	911	940
Inventories	404	524	927	969	1 006	1 048	1 086	1 144	1 189	1 237
Trade receivables	94	114	123	127	133	138	145	150	155	160
Trade payables	(894)	(852)	(945)	(997)	(1 075)	(1 147)	(1 230)	(1 302)	(1 378)	(1 454)
Current tax	(57)	11	(69)	(69)	(69)	(69)	(69)	(69)	(69)	(69)
NWC	173	469	764	777	779	786	786	805	809	813
Intangible assets	374	370	400	393	393	388	385	376	365	353
PP&E	67	121	128	135	143	151	160	169	178	188
Leased products	44 700	42 820	43 462	44 114	44 776	45 448	46 129	46 821	47 524	48 236
Other assets, net of other liabilities	(12 252)	(14 687)	(14 907)	(15 131)	(15 358)	(15 588)	(15 822)	(16 059)	(16 300)	(16 545)
Receivables from sales financing	87 417	85 708	86 565	87 431	88 305	89 188	90 080	90 981	91 891	92 809
Financial liabilities	(43 337)	(42 061)	(42 902)	(43 760)	(44 635)	(45 528)	(46 439)	(47 368)	(48 315)	(49 281)
Provisions	(612)	(675)	(743)	(817)	(898)	(988)	(1 087)	(1 196)	(1 315)	(1 447)
Deferred tax	(660)	(1 222)	(685)	(685)	(685)	(685)	(685)	(685)	(685)	(685)
Core Invested Capital	75 870	70 843	72 082	72 456	72 819	73 171	73 506	73 844	74 151	74 442
Non-core business										
Investments	6 353	1 771	2 125	2 497	2 872	3 231	3 554	3 909	4 300	4 730
Intangible assets	1	1	1	1	1	1	1	1	1	1
Trade receivables, net of trade payables	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)
Financial assets	7 515	8 237	9 124	9 469	10 034	10 549	11 186	11 833	12 722	14 521
Other assets, net of other liabilities	3 495	3 486	3 752	4 073	4 429	4 789	5 171	5 556	5 956	6 369
Assets held for sale, net	-	-	-	-	-	-	-	-	-	-
Non-core provisions	(7 157)	(6 012)	(7 124)	(8 063)	(9 243)	(10 438)	(11 790)	(13 196)	(14 647)	(16 285)
Current tax	1 065	200	430	430	430	430	430	430	430	430
Deferred tax	(4)	(123)	(4)	(4)	(4)	(4)	(4)	(4)	(4)	(4)
Non-core Invested Capital	11 258	7 550	8 295	8 393	8 509	8 548	8 537	8 519	8 749	9 753
Financial										
Net Debt	(47 167)	(41 078)	(40 015)	(40 732)	(41 411)	(42 113)	(42 811)	(43 504)	(44 188)	(44 808)
Equity										
Total Common Shareholder's Equity	74 307	88 327	94 335	95 976	97 551	99 100	100 590	102 063	103 761	106 100

Income Statement

	Forecasted IS - BMW Group									
Fiscal year ending 31 Dec (in € million)	2021A	2022A	2023F	2024F	2025F	2026F	2027F	2028F	2029F	2030F
Core business										
Industrial segment										
Automotive										
Revenues	77 173	105 834	113 961	117 983	124 497	130 090	136 603	142 233	148 038	153 795
Cost of sales	(48 170)	(71 508)	(76 686)	(80 398)	(83 975)	(87 485)	(91 224)	(94 972)	(98 877)	(102 908)
Gross Profit	29 003	34 326	37 275	37 585	40 521	42 604	45 379	47 261	49 161	50 886
R&D Expenses	(6 299)	(6 624)	(7 222)	(7 832)	(8 399)	(9 021)	(9 640)	(10 261)	(10 900)	(11 549)
Selling and administrative expenses	(7 546)	(8 749)	(11 547)	(11 954)	(12 614)	(13 181)	(13 704)	(14 241)	(14 791)	(15 381)
Other operating income, net of other operating expenses	43	209	129	134	141	147	155	161	168	174
EBITDA	15 201	19 163	18 636	17 933	19 649	20 550	22 190	22 921	23 637	24 130
Depreciation and Amortisation	(6 290)	(8 373)	(8 993)	(9 498)	(10 026)	(10 576)	(11 149)	(11 745)	(12 361)	(12 995)
EBIT	8 911	10 790	9 643	8 434	9 623	9 974	11 041	11 176	11 276	11 134
Statutory Taxes	(2 745)	(3 334)	(2 980)	(2 606)	(2 974)	(3 082)	(3 412)	(3 453)	(3 484)	(3 441)
Tax adjustments	(416)	(1 375)	(1 377)	(1 318)	(1 277)	(1 216)	(1 153)	(1 200)	(1 249)	(1 298)
NOPLAT	5 750	6 081	5 287	4 510	5 372	5 676	6 477	6 522	6 543	6 396
Motorcycle										
Revenues	2 761	3 194	3 393	3 571	3 766	3 968	4 168	4 355	4 547	4 745
Cost of sales	(2 154)	(2 539)	(2 905)	(3 006)	(3 090)	(3 187)	(3 272)	(3 415)	(3 515)	(3 621)
Gross Profit	607	655	488	565	676	782	896	940	1 032	1 124
Selling and administrative expenses	(264)	(296)	(356)	(375)	(395)	(417)	(438)	(457)	(477)	(498)
Other operating income, net of other operating expenses	2	5	2	2	2	3	3	2	2	3
EBITDA	345	364	134	192	283	368	461	485	557	628
Depreciation and Amortisation	(118)	(107)	(107)	(114)	(121)	(130)	(139)	(150)	(163)	(177)
EBIT	227	257	27	78	162	238	321	335	394	451
Statutory Taxes	(70)	(79)	(8)	(24)	(50)	(73)	(99)	(103)	(122)	(139)
Tax adjustments	19	22	15	16	17	17	18	19	20	21
NOPLAT	176	200	34	70	128	182	240	250	292	332
Financial Services										
Revenues	31 304	33 581	36 328	37 318	39 224	40 778	42 651	44 086	45 562	46 984
Cost of Sales	(24 493)	(26 692)	(28 875)	(29 662)	(31 177)	(32 412)	(33 901)	(35 042)	(36 215)	(37 345)
Gross Profit	6 811	6 889	7 453	7 656	8 047	8 366	8 750	9 044	9 347	9 639
Selling and administrative expenses	(1 382)	(1 538)	(1 670)	(1 721)	(1 815)	(1 893)	(1 987)	(2 060)	(2 136)	(2 210)
Other operating income, net of other operating expenses	(32)	21	(28)	(17)	(19)	(15)	(12)	(18)	(16)	(16)
EBITDA	5 397	5 372	5 755	5 918	6 213	6 457	6 752	6 966	7 195	7 413
Depreciation and Amortisation	(87)	(86)	(73)	(78)	(84)	(90)	(97)	(104)	(111)	(120)
EBIT	5 311	5 286	5 681	5 840	6 129	6 368	6 655	6 862	7 083	7 292
Statutory Taxes	(1 636)	(1 633)	(1 756)	(1 805)	(1 894)	(1 968)	(2 056)	(2 120)	(2 189)	(2 253)
Tax adjustments	798	960	986	1 013	1 064	1 107	1 157	1 196	1 236	1 275
NOPLAT	4 473	4 613	4 912	5 048	5 300	5 507	5 756	5 938	6 131	6 314
Non-core										
Non-operating profit/loss	5 750	10 898	1 430	1 774	2 377	2 942	2 823	2 387	2 583	2 755
Financial										
Financing Result	(1 285)	(1 612)	(3 198)	(3 336)	(3 477)	(3 623)	(3 772)	(3 907)	(4 098)	(4 263)
Total Comprehensive Income	14 864	20 180	8 464	8 066	9 700	10 684	11 524	11 191	11 451	11 535

Core Free Cash Flow Map

Fiscal year ending 31 Dec (in € million)	2021A	2022A	FCF - BMW Group							
Core business			2023F	2024F	2025F	2026F	2027F	2028F	2029F	2030F
Automotive										
EBIT	8 911	10 790	9 643	8 434	9 623	9 974	11 041	11 176	11 276	11 134
Statutory Tax	(2 745)	(3 334)	(2 980)	(2 606)	(2 974)	(3 082)	(3 412)	(3 453)	(3 484)	(3 441)
Tax Adjustments	(416)	(1 375)	(1 377)	(1 318)	(1 277)	(1 216)	(1 153)	(1 200)	(1 249)	(1 298)
NOPLAT	5 750	6 081	5 287	4 510	5 372	5 676	6 477	6 522	6 543	6 396
(+) Depreciation and Amortisation	6 290	8 373	8 993	9 498	10 026	10 576	11 149	11 745	12 361	12 995
Gross FCF	12 040	14 454	14 279	14 009	15 398	16 252	17 625	18 267	18 903	19 392
(-) Δ NWC	735	(3 125)	(229)	(793)	(927)	(903)	(995)	(981)	(1 033)	(1 073)
(-) Net CAPEX	(4 145)	(4 645)	(5 206)	(5 503)	(5 783)	(6 077)	(6 377)	(6 653)	(6 931)	(7 198)
in PP&E	1 722	2 061	2 731	2 823	2 977	3 107	3 260	3 389	3 521	3 645
in Intangible Assets	2 423	2 584	2 475	2 680	2 806	2 970	3 117	3 265	3 410	3 553
(-) Other changes in PP&E	(3 051)	(12 303)	(4 275)	(4 419)	(4 659)	(4 863)	(5 102)	(5 304)	(5 512)	(5 705)
(-) Other changes in Intangible Assets	(236)	(9 836)	(1 096)	(1 155)	(1 211)	(1 270)	(1 328)	(1 380)	(1 432)	(1 482)
(-) Other changes in Invested Capital	921	4 983	(1 067)	543	837	738	854	802	775	873
FCF (Automotive)	6 263	(10 472)	2 407	2 680	3 655	3 877	4 677	4 751	4 769	4 807
Motorcycle										
EBIT	227	257	27	78	162	238	321	335	394	451
Statutory Tax	(70)	(79)	(8)	(24)	(50)	(73)	(99)	(103)	(122)	(139)
Tax Adjustments	19	22	15	16	17	17	18	19	20	21
NOPLAT	176	200	34	70	128	182	240	250	292	332
(+) Depreciation and Amortisation	118	107	107	114	121	130	139	150	163	177
Gross FCF	294	307	141	183	250	311	380	401	455	510
(-) Δ NWC	150	(91)	(72)	(40)	(41)	(44)	(44)	(52)	(48)	(51)
(-) Net CAPEX	(64)	116	(65)	(72)	(77)	(82)	(86)	(91)	(96)	(103)
in PP&E	34	32	43	44	46	48	51	53	55	57
in Intangible Assets	29	(148)	23	28	31	33	36	38	41	46
(-) Other changes in PP&E	(88)	(95)	(67)	(69)	(73)	(76)	(79)	(83)	(86)	(89)
(-) Other changes in Intangible Assets	(16)	(200)	(10)	(12)	(14)	(17)	(21)	(25)	(30)	(37)
(-) Other changes in Invested Capital	39	49	26	23	26	27	27	26	26	28
FCF (Motorcycle)	316	87	(48)	14	71	119	176	176	221	258
Financial Services										
EBIT	5 311	5 286	5 681	5 840	6 129	6 368	6 655	6 862	7 083	7 292
Statutory Tax	(1 636)	(1 633)	(1 756)	(1 805)	(1 894)	(1 968)	(2 056)	(2 120)	(2 189)	(2 253)
Tax Adjustments	798	960	986	1 013	1 064	1 107	1 157	1 196	1 236	1 275
NOPLAT	4 473	4 613	4 912	5 048	5 300	5 507	5 756	5 938	6 131	6 314
(+) Depreciation and Amortisation	87	86	73	78	84	90	97	104	111	120
Gross FCF	4 559	4 699	4 985	5 126	5 383	5 596	5 853	6 042	6 242	6 434
(-) Δ NWC	297	(296)	(295)	(13)	(3)	(7)	0	(19)	(3)	(5)
(-) Net CAPEX	(41)	328	(73)	(37)	(48)	(45)	(49)	(45)	(47)	(48)
in PP&E	5	8	10	11	11	12	13	13	14	14
in Intangible Assets	36	(336)	63	26	36	33	36	32	33	34
(-) Other changes in PP&E	3	(64)	(16)	(17)	(18)	(19)	(20)	(20)	(21)	(22)
(-) Other changes in Intangible Assets	(35)	(399)	(21)	(23)	(26)	(30)	(34)	(38)	(43)	(48)
(-) Other changes in Invested Capital	(3 748)	5 373	(907)	(362)	(352)	(342)	(330)	(318)	(304)	(289)
FCF (Financial Services)	1 035	9 640	3 673	4 674	4 937	5 155	5 421	5 601	5 824	6 023

Disclosures and Disclaimers

Report Recommendations

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

This report was prepared by [*insert student's name*], a Master in Finance student of Nova School of Business and Economics ("Nova SBE"), within the context of the Field Lab – Equity Research.

This report is issued and published exclusively for academic purposes, namely for academic evaluation and master graduation purposes, within the context of said Field Lab – Equity Research. It is not to be construed as an offer or a solicitation of an offer to buy or sell any security or financial instrument.

This report was supervised by a Nova SBE faculty member, acting merely in an academic capacity, who revised the valuation methodology and the financial model.

Given the exclusive academic purpose of the reports produced by Nova SBE students, it is Nova SBE understanding that Nova SBE, the author, the present report and its publishing, are excluded from the persons and activities requiring previous registration from local regulatory authorities. As such, Nova SBE, its faculty and the author of this report have not sought or obtained registration with or certification as financial analyst by any local regulator, in any jurisdiction. In Portugal, neither the author of this report nor his/her academic supervisor is registered with or qualified under COMISSÃO DO MERCADO DE VALORES MOBILIÁRIOS ("CMVM", the Portuguese Securities Market Authority) as a financial analyst. No approval for publication or distribution of this report was required and/or obtained from any local authority, given the exclusive academic nature of the report.

The additional disclaimers also apply:

USA: Pursuant to Section 202 (a) (11) of the Investment Advisers Act of 1940, neither Nova SBE nor the author of this report are to be qualified as an investment adviser and, thus, registration with the Securities and Exchange Commission ("SEC", United States of America's securities market authority) is not necessary. Neither the author nor Nova SBE receive any compensation of any kind for the preparation of the reports.

Germany: Pursuant to §34c of the WpHG (*Wertpapierhandelsgesetz*, i.e., the German Securities Trading Act), this entity is not required to register with or otherwise notify the *Bundesanstalt für Finanzdienstleistungsaufsicht* ("BaFin", the German Federal Financial Supervisory Authority). It should be noted that Nova SBE is a fully-owned state university and there is no relation between the student's equity reports and any fund raising programme.

UK: Pursuant to section 22 of the Financial Services and Markets Act 2000 (the "FSMA"), for an activity to be a regulated activity, it must be carried on "by way of business". All regulated activities are subject to prior authorization by the Financial Conduct Authority ("FCA"). However, this report serves an exclusively academic purpose and, as such, was not prepared by way of business. The author - a Master's student - is the **sole and exclusive responsible** for the information, estimates and forecasts contained herein, and for the opinions expressed, which exclusively reflect his/her own judgment at the date of the report. Nova SBE and its faculty have no single and formal position in relation to the most appropriate valuation method, estimates or projections used in the report and may not be held liable by the author's choice of the latter.

The information contained in this report was compiled by students from public sources believed to be reliable, but Nova SBE, its faculty, or the students make no representation that it is accurate or complete, and accept no liability whatsoever for any direct or indirect loss resulting from the use of this report or of its content.

Students are free to choose the target companies of the reports. Therefore, Nova SBE may start covering and/or suspend the coverage of any listed company, at any time, without prior notice. The students or Nova SBE are not responsible for updating this report, and the opinions and recommendations expressed herein may change without further notice.

The target company or security of this report may be simultaneously covered by more than one student. Because each student is free to choose the valuation method, and make his/her own assumptions and estimates, the resulting projections, price target and recommendations may differ widely, even when referring to the same security. Moreover, changing market conditions and/or changing subjective opinions may lead to significantly different valuation results. Other students' opinions, estimates and recommendations, as well as the advisor and other faculty members' opinions may be inconsistent with the views expressed in this report. Any recipient of this report should understand that statements regarding future prospects and performance are, by nature, subjective, and may be fallible.

This report does not necessarily mention and/or analyze all possible risks arising from the investment in the target company and/or security, namely the possible exchange rate risk resulting from the security being denominated in a currency either than the investor's currency, among many other risks.

The purpose of publishing this report is merely academic and it is not intended for distribution among private investors. The information and opinions expressed in this report are not intended to be available to any person other than Portuguese natural or legal persons or persons domiciled in Portugal. While preparing this report, students did not have in consideration the specific investment objectives, financial situation or

particular needs of any specific person. Investors should seek financial advice regarding the appropriateness of investing in any security, namely in the security covered by this report.

The author hereby certifies that the views expressed in this report accurately reflect his/her personal opinion about the target company and its securities. He/ She has not received or been promised any direct or indirect compensation for expressing the opinions or recommendation included in this report.

[If applicable, it shall be added: *“While preparing the report, the author may have performed an internship (remunerated or not) in [insert the Company’s name]. This Company may have or have had an interest in the covered company or security”* and/ or *“A draft of the reports have been shown to the covered company’s officials (Investors Relations Officer or other), mainly for the purpose of correcting inaccuracies, and later modified, prior to its publication.”*]

The content of each report has been shown or made public to restricted parties prior to its publication in Nova SBE’s website or in Bloomberg Professional, for academic purposes such as its distribution among faculty members for students’ academic evaluation.

Nova SBE is a state-owned university, mainly financed by state subsidies, students tuition fees and companies, through donations, or indirectly by hiring educational programs, among other possibilities. Thus, Nova SBE may have received compensation from the target company during the last 12 months, related to its fundraising programs, or indirectly through the sale of educational, consulting or research services. Nevertheless, no compensation eventually received by Nova SBE is in any way related to or dependent on the opinions expressed in this report. The Nova School of Business and Economics does not deal for or otherwise offer any investment or intermediation services to market counterparties, private or intermediate customers.

This report may not be reproduced, distributed or published, in whole or in part, without the explicit previous consent of its author, unless when used by Nova SBE for academic purposes only. At any time, Nova SBE may decide to suspend this report reproduction or distribution without further notice. Neither this document nor any copy of it may be taken, transmitted or distributed, directly or indirectly, in any country either than Portugal or to any resident outside this country. The dissemination of this document other than in Portugal or to Portuguese citizens is therefore prohibited and unlawful.