A Work Project, presented as part of the requirements for the Award of a Master's degree in Finance from the Nova School of Business and Economics.

Dr. Ing. h.c. F. Porsche Aktiengesellschaft

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IPO Valuation

"Analyzing IPO Underpricing Patterns:

A Deep Dive into External Effects in the German Market"

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24/01/2024

Abstract

This study delves into the Porsche AG IPO held on September 29, 2022. It employs various valuation methods such as DCF, APV, CCA and CTA to assess the intrinsic value of Porsche AG. The findings indicate that the IPO price was set lower than the company's actual value. Furthermore, this work investigates specific external market factors that are contributing to the phenomenon of underpricing in IPOs. By analyzing these market dynamics focusing on the German market, this work offers insights into the complexities of IPO valuations and the broader impacts they have.

JEL-Classification: *G12, G14, G17, G24, G32*

Keywords: *Initial public offerings, Value of Firm, Share Prices, Financial Forecast, Under-pricing, Automotive*

This work used infrastructure and resources funded by Fundação para a Ciência e a Tecnologia (UID/ECO/00124/2013, UID/ECO/00124/2019 and Social Sciences DataLab, Project 22209), POR Lisboa (LISBOA-01-0145-FEDER-007722 and Social Sciences DataLab, Project 22209) and POR Norte (Social Sciences DataLab, Project 22209).

1. Introduction

Throughout a span of 75 years, Dr. Ing. h.c. F. Porsche Aktiengesellschaft (Porsche AG or Porsche) has strengthened its status as a renowned luxury brand through remarkable achievements in motorsport and the development of luxury performance vehicles. Its financial resilience has been demonstrated even in challenging economic circumstances (Porsche AG 2021a). Porsche's top position in the Brand Finance Study 2022 underlines the belief that the strength and robustness of the brand plays a key role in determining pricing power in the automotive industry and that Porsche is in such position to benefit from its excellent reputation (Brand Finance 2022). While it may not carry the same level of exclusivity as Ferrari, Porsche boasts a broader and more accessible market, including sports car enthusiasts and luxury fans. With Porsche's successfully entry into the public market on September 29, 2022 at the Frankfurter Stock Exchange, the automotive world witnessed a defining moment in the history of the company. Porsche’s IPO immediately made headlines as it became Europe's largest IPO by market capitalization, with an initial valuation of EUR 78bn (Porsche AG 2021a). The preferred shares were valued at EUR 82.50 each, making them accessible to investors on the public market under the Securities Number "PAG911" (BaFin 2022). Oliver Blume, the Chairman of Porsche AG's executive board, stated in an interview: "Making our customers dreams come true is what drives us. Today, a big dream comes true for us." Porsche's commitment to excellence, with a portfolio of legendary vehicles such as the 356, 911 GT3 RS, 911 Carrera RS 2.7, 911 Turbo and Cayenne GT, was reflected in his statement. This IPO journey represents more than just a financial milestone – it represents a strategic shift towards increased entrepreneurial flexibility and autonomy. It should give Porsche more independence and increased freedom in decision making as the profit and loss transfer agreement with Volkswagen came to an end. Both companies made efforts to replace this agreement through an industrial cooperation agreement (ICA). The ICA aims to support a mutually beneficial relationship between Porsche and Volkswagen, aligning their goals to ensure the continuous growth of Porsche. However, Porsche's ambitions

extend far beyond financial success. With a clear vision, Porsche strives to redefine their luxury offerings by increasing their sustainable and social footprint. Their goal is to lead in electromobility, targeting a +50% BEV share in 2025 and +80% by 2030. Porsche's IPO is a transformational journey, merging the fascination of luxury sports cars with a commitment to sustainability and innovation. In fact, the IPO offers investors the opportunity to participate in a luxury automotive company with strong underlying fundamentals and significant potential for increased profitability (Porsche AG 2022b).

In this thesis, we aim to assess the value of Porsche following its IPO that took place on the 29 of September in 2022 and the accuracy of the pricing of Porsches intrinsic value of EUR 78bn. Thereof, we will delve into the theoretical fundamentals, elaborating on the overall procedure of an IPO, the motivations that drive companies to embark on an IPO journey, and the key stakeholders which are participating. Following this theoretical framework, we will present a comprehensive overview of the company, providing detailed insights into its history, operations, and unique market positioning. Subsequently, we will conduct an analysis of Porsche's IPO, examining the implications of this financial event. Moreover, we will shift our focus to the market in which Porsche operates, conducting an in-depth market analysis. Building on this market perspective, we will deep dive into Porsche's financial statements and performance, incorporating our forecast methodology and assumptions. Based on this financial analysis, we will perform a comprehensive company valuation, employing various valuation methodologies such as an intrinsic and relative valuation. Lastly, we consolidate our findings, providing a cohesive summary of our research. The structure of this work follows a theoretical and fundamental analysis which is shown below.

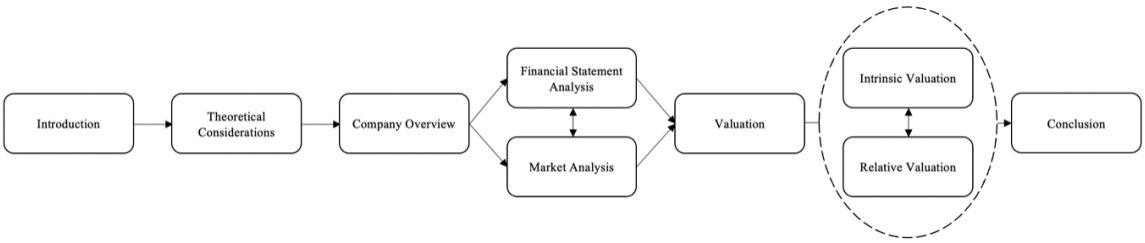


Figure 1.1 Structure of this study (Created by authors)

2. Literature Overview

This part of the study will offer a comprehensive look at IPOs, encompassing the participants, the procedure and the general motivations for becoming a publicly traded entity.

2.1 Initial Public Offerings

In seeking capital, a company may opt to issue equity securities, whether in a private or public capacity, to raise funds that can be channeled towards forthcoming operations or immediate financial obligations. Private issuances are frequently facilitated through rights offerings to current stakeholders or targeted equity placements with a select of few new investors. Conversely, public issuances take the form of rights offerings extended to existing public shareholders or share placements aimed at a broader, public audience, to diversify the ownership across a wider spectrum of stakeholders (Brealey et al. 2020). An IPO signals the first move when a company that was privately owned decides to make its shares accessible to the broader market on a regulated stock exchange. Following this step, both private individuals and institutional investors gain the ability to buy or sell these shares (Hillier et al. 2014). Once a company's stocks are actively traded on the regulated stock exchange, there is an opportunity for the company to release additional shares to the market, also known as a Seasoned Equity Offering (SEO) or a follow-on offering (Jegadeesh et al. 1993). Handling follow-on offerings tends to be more straightforward for publicly traded companies because they already have an established market price. This knowledge provides them with a reasonable basis for determining the pricing of

their additional equity shares, whether they choose rights issues or cash offerings. On the other hand, when a company undergoes an IPO, the market price of its shares is an unknown variable and must be established using traditional supply-and-demand principles (Fernandes et al. 2013). Over time, various approaches have been employed to determine the quantity and pricing of these shares, each with its own set of advantages and drawbacks (Brealey et al. 2020). Beyond the issuing company, numerous market participants play essential roles in shaping the pricing and execution of an IPO such as the investors and the underwriters. The company going public makes important decisions in the run-up to the issue, such as selecting the appropriate market and choosing the underwriting bank or underwriting syndicate (Loughran and Ritter 2000). In terms of investors, they can be either retail or institutional investors. Retail investors trade on a smaller scale for personal investment purpose. In contrast, institutional investors manage substantial funds such as banks and hedge funds (Aggarwal et al. 2002). Lastly, major banks or financial institutions typically serve as the underwriters that the company going public hires to guide them through the process. Their main objective is to make sure the company raises the needed money by selling its stock (Ferran and Ho 2014).

2.3 The process of an IPO

Making the transition to a publicly listed company is a significant, long-term commitment for any firm. In fact, the preparations for an IPO and the steps involved in getting a privately-owned company ready to become a publicly traded entity can extend over several years (Blowers et al. 1999). However, the IPO process itself generally takes only three to four months to complete and can be divided into five stages (Jenkinson and Ljungqvist 2001). To begin with, during the Market Selection and Decision Phase, the IPO candidate faces the crucial task of choosing the market in which it wishes to be placed. Notably, this market selection need not be limited to the organization's home country. For instance, listing requirements, liquidity, and regulatory considerations are affecting this decision. Moving forward into the Security Prospectus

Development Phase, the company engages in partnerships with one or more banks that are ready to assume roles as managers and underwriters for the IPO (Corwin and Schultz 2005). These banking entities have a pivotal role in orchestrating the offering. During that stage, a comprehensive company valuation is conducted, to determine the company's intrinsic value. This valuation forms the basis for establishing the issue price or a price range (Jenkinson and Ljungqvist 2001). Subsequently, an initial prospectus is released, providing crucial insights for the upcoming IPO. Mandated banks may also engage in preliminary marketing efforts (Kirchhoff and Piwinger 2005). The following phase, offering advertisement and investor engagement, involves active marketing initiatives to attract potential investors. These actions encompass road shows where the senior management or company leaders travel across the country to introduce themselves and their business, along with having meetings with potential investors. These discussions will be also led by the assisting investment bank. The purpose of a roadshow is to generate interest and confidence among investors to ultimately encourage them to buy shares in the upcoming IPO, which contributes to the final offer price (Katti and Phani 2016). In the Pricing and Share Allocation Phase, a careful assessment leads to the establishment of the ultimate offering price, with the chosen pricing method playing a significant role in shaping the process. Depending on demand, two allocation methods emerge. In the fixed price method, oversubscribed issues may lead to pro-rata allocation or a lottery, while undersubscribed offerings result in investment banks acquiring remaining shares. With the bookbuilding method, pricing is based on investor demand, and the allocation of shares is defined by the decisions of the investment banks and the issuer. (Benveniste and Busabe 1997). Finally, in the stabilization phase, the investment bank often plays a central role in maintaining price stability. Strategies encompass selling additional shares in response to excess demand or purchasing shares to uphold prices above the issue price (Deutsche Börse AG 2006). In this phase, an over-allotment or greenshoe option can also be exercised, which offers the investment banks flexibility in managing the supply and demand dynamics and further increases price stability (Wahrenburg 2001).

2.4 Reasons for Going Public

Companies considering an IPO engage on this transformative journey for a variety of compelling reasons, and it's not just about financial motives but also because of strategic reasons (Carls 2013). While the IPO certainly raise new funds from both local and global investors, it also opens the way for future equity capital expansion. Moreover, it provides an exit strategy for existing shareholders who can convert their investments into cash when needed (Ritter and Welch 2002). Another important advantage is the positive impact on the conditions of bank loans. As soon as a company goes public, it levels the playing field with banks and removes the information advantage that banks normally enjoy. This results in reduced borrowing costs for the firm (Stoughton et al. 2001). Furthermore, becoming a public company significantly boosts the firm's profile. Regular financial reporting and the attention of financial analysts draw more eyes to the company, attracting potential investors and even prospective employees (Kesten 2018). Additionally, going public often serves as a strategic maneuver to facilitate future expansion, particularly through mergers and acquisitions. The capital raised from the IPO can be crucial for financing strategic acquisitions, enabling the company to pursue growth opportunities in the market (Jakob 1998). However, it's essential to acknowledge that there are significant costs associated with going public. On the one hand, direct expenses encompass legal, consulting, and auditing fees, along with commissions paid to underwriters. In contrast, indirect costs involve the administrative efforts required in the process (Ang and Brau 2002). In general, a company's choice to embark on an IPO is motivated by a mix of strategic considerations and financial necessities. It's not merely a quick capital-raising tool but a complex move with both advantages and costs. Ultimately, the choice to go public is more about maneuvering in the competitive business landscape, including the pursuit of future expansion through M&A (Brau and Fawcett 2006). Please refer to *figure 1.2* in the *appendix* for an illustration of the results from a survey conducted by Brau and Fawcett on the rationales for companies deciding to go public.

3. Porsche in detail

Within the subsequent part, we delve into a comprehensive evaluation of Porsche. The primary objective is to grasp a more comprehensive understanding of Porsche's business model by exploring various facets, which then serves as the cornerstone for our forecast of the financial statements.

3.1 History

In 1931, Porsche, marked its first appearance in the commercial register. Originally founded as a neutral design office by Ferdinand Porsche, the company developed into a major automotive manufacturer from 1945 onwards. Porsche made a significant mark in its early years by crafting the timeless Volkswagen Beetle in 1939. Subsequently, in 1948, the company presented its own automobile, the 356, establishing the cornerstone for the brand's forthcoming success. A defining moment in Porsche's history occurred in 1963 when the follow-up model, the 911, was presented. This new model would become one of Porsche's most iconic and recognizable vehicles (Porsche AG 2018). It is the model with the longest history, with the 8th version currently on the market. Total deliveries since 1964 exceed 1m units and over 24 different versions of the 911 are available, including the Coupé, Cabriolet, Targa, Carrera, Turbo S and GT3 (Porsche AG 2022a). Over the years, Porsche continued to innovate and expand its product line. They introduced models such as the Boxster (1996), Cayenne (2002), Cayman (2006), Panamera (2009), Macan (2014), and Taycan (2019). These additions not only demonstrate Porsche's commitment to excellence but also significantly expanded its market presence and influence (Porsche AG 2018). Since its inception, Porsche has been headquartered in Stuttgart-Zuffenhausen, Germany, and employs 36,996 people as of 2021. The company strategically places its production facilities in various locations. Stuttgart-Zuffenhausen produces the Taycan, 911, and 718 models, along with sports cars by Porsche Motorsport, while Leipzig focuses on the Macan and Panamera. The Cayenne is produced in multiple locations, with

production facilities in Malaysia and Bratislava. The latter facility belongs to the Volkswagen Group's multi-brand production facility. This global network ensures efficient production and delivery of Porsche's vehicles to customers worldwide. In fact, Porsche's global reach extends across numerous countries, with a strong presence in key markets such as the United States, China, and Europe. Their vehicles are in demand worldwide (Porsche AG 2021a).

3.2 Pre and Post IPO Organizational Structure

Since its founding, Porsche has undergone several changes to its legal entity, the most significant being the takeover by Volkswagen. Nonetheless, to understand the relationships and structures of the holdings, we must first introduce the Porsche Automobil Holding SE (Porsche SE). Porsche SE is a holding company established in 2007 and headquartered in Stuttgart. It emerged as a subsidiary with full control over the day-to-day business of the former Porsche AG corporation. The conversion from AG into an SE transformed the AG's shareholders into new Porsche SE shareholders. On March 3, 2008, Porsche SE went public (Porsche SE 2022). The Porsche and Piëch families still retain 100% of the common shares and the voting rights. Private investors can only acquire non-voting preferred shares on the capital market. Furthermore, Porsche SE has investments in other companies operating in mobility and industrial technologies. It's essential to differentiate Porsche SE from the sports car manufacturer Porsche AG (Porsche SE 2021). In 2005, Porsche first expressed intentions to acquire Volkswagen AG. Porsche SE attempted to gain voting rights in Volkswagen AG through recurrent purchases of common shares. At that time, Volkswagen, with revenues of EUR 95bn, was significantly larger and financially stronger than Porsche, which had EUR 7bn in revenue. By 2008, Porsche SE already held 42% of common shares and an additional 31% through options on Volkswagen. News of a domination and profit transfer agreement in a potential Volkswagen takeover by Porsche briefly pushed Volkswagen shares above 1,000 EUR per share. By early 2009, the stake in common shares had risen to 50.8%. Porsche SE's debt reached EUR 11.4bn in 2009 due to the

attempted takeover, becoming a critical issue amid the 2009 financial crisis. As a result, the takeover plans failed, and in return, Volkswagen acquired 50% of Porsche AG in 2009 (Grah 2019). During the legal restructurings – which concluded in 2012 – Volkswagen AG (VW AG) acquired 100% of the shares and the entire operational business of Porsche AG. Following the merger with VW AG, Porsche's SE's shareholding in VW AG stands as of 2021 (Pre-IPO structure) at 31.4% of subscribed capital (Stake of ordinary shares: 53.3%) while VW AG has 100% control over Porsche AG (the vehicle manufacturer) (Porsche SE 2021). The Pre IPO organizational structure can be seen in the *appendix* in *figure 1.3*. On September 29, 2022, Porsche initiated its IPO with a total share capital of 911m. The ownership structure includes 455.5m preferred shares and an equal number of ordinary shares, both valued at EUR 1 each. The ordinary shares are divided between Porsche SE, accounting for 25.1% or approximately 12.5% of Porsche AG's total share capital, and Volkswagen AG, which holds the majority at 74.9% (Porsche AG 2022e). Volkswagen AG also holds 75% of the preferred shares. Porsche SE remains the single-largest shareholder of VW AG, owning 53.3% of the ordinary shares and 31.9% of the subscribed capital. Apart from the stake of Porsche SE, Qatar and the State of Lower Saxony are also major shareholders at VW. Indeed, Qatar holds a 10.5% stake of VW's total share capital and has 17% of the voting rights, while Lower Saxony owns around 11.8% of VW's total share capital and has 20% of the voting rights (Volkswagen AG 2021). The following figure represents the ownership structure after Porsche's IPO in September 2022.

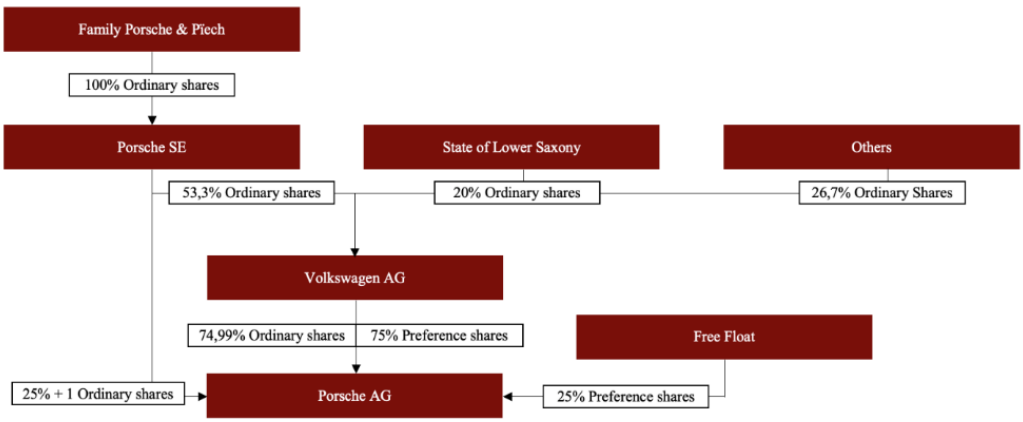


Figure 1.4 Shareholder structure post IPO (Created by authors based on the information's retrieved from the respective annual reports)

3.3 Management Board

The management team consists of highly experienced executives who bring decades of expertise in the automotive industry. While some of these leaders have dedicated their entire careers to the VW Group, others have gained their skills at respected German premium OEMs and automotive suppliers (Porsche AG 2021a). Furthermore, in contrast to the agreement with VW AG / Porsche SE, the supervisory board comprises 19 members instead of the originally 20. Porsche SE holds three of these seats, including the position of chairman, while three seats are allocated to independent representatives. Another three are designated for VW Group representatives, and nine are designated for employee representatives. Hans Dieter Pötsch plays a unique role, as he represents both VW Group and Porsche SE simultaneously (Porsche SE 2021). Additionally, the relationship between VW Group and Porsche AG is continually evolving. We note that Porsche CEO Oliver Blume has recently been appointed as the CEO of the VW Group. This may raise potential conflicts of interest in the future, but the company asserts that a framework is in place to ensure that decisions at Porsche AG prioritize shareholder value (Schallenberger and Ginsburg 2022). The connection between VW Group and Porsche AG is regulated by both an ICA Agreement and a Relationship Agreement (Porsche AG 2022b). An overview of Porsche's management board can be found in *table 1.1* in the *appendix*.

3.4 Business Model Overview and Strategy

Porsche's business model is deeply rooted in its founder's vision and operates in the luxury automobile sector (Porsche AG 2018). The luxury car manufacturer’s purpose is to create high-performance sports cars and SUVs, and its commitment to innovation and meeting market needs (Porsche AG 2021a). In fact, Porsche boasts a diverse portfolio of six model families – 911 (Icon), Taycan (Performance), Macan (Lifestyle), 718 (Driving Fun), Cayenne (Functionality) and Panamera (Elegance) (Volkswagen Group 2022a). Hence, the core business focuses on the design, manufacturing, and distribution of high-end consumer products. In addition to these

core activities, the company engages in cutting-edge research and development, shaping future products and technologies. In addition, the brand is not only known for its high-quality products, but also for its strategic licensing and merchandising activities, which enable the commercial exploitation of the brand rights, including various exclusive intellectual property rights. Adding to this, the company has diversified its interests into financial services, providing an extensive array of financial and mobility solutions to cater both its customer base and network of dealers. Hence, Porsche operates within two main business areas: the automotive segment and the financial services segment. The core of Porsche's revenue, and around 91% of its total income, is generated by selling luxury vehicles, including sports cars, sports limousines, and SUVs. The remaining revenue of 9% originates through Porsches leasing and financing business, adding up to the revenue of its financial services business. Geographically, Porsche's sales are supported by a diversified regional mix and are distributed as of 2021 as follows: 32% in China, 26% in North America, 29% in Europe, and 13% in other regions globally (Porsche AG 2021a). Moreover, its transitioning and ambitious approach until 2030 is pivotal in shaping its future in the context of the mobility transition and the shift away from ICE. The strategy places significant importance on electrification, aiming to boost the delivery of Battery Electric Vehicles (BEV) up to more than 50% by 2025 and up to 80% by 2030. The strategy also targets transformation in digitalization, sustainability, innovation, and employee development (Porsche AG 2022c). Nonetheless, the implementation of Porsche's strategy 2030 requires a high level of transformative investments. Porsche has therefore entered into several strategic partnerships with direct investments and intends to play a leading role in various trend topics that will become relevant in the coming years (Porsche AG 2021a). We list some notable examples of joint ventures and partnerships below:

- Joint venture with Bugatti Rimac: In 2021, the JV consortium was established, creating a partnership between the Croatian electric vehicle manufacturer Rimac and the renowned luxury car brand Bugatti. In a recent funding round, Rimac Group achieved a

valuation exceeding EUR 2bn. Porsche has invested in Rimac Group with a 20% ownership stake and also holds a 45% stake in the joint venture Bugatti Rimac. This effort aims to combine Bugatti's exceptional hypercar knowledge with Rimac's cutting-edge electric vehicle technology (Porsche AG 2021b).

- Joint venture with Cellforce Group: Porsche has initiated a joint venture to further develop state-of-the-art lithium-ion battery technology an involves a partnership between Porsche and the German company Customcells Holding GmbH, holding 83.8% of all shares. Additionally, the partnership includes BASF as a crucial collaborator, providing essential components for the batteries. The primary objective of this collaboration is to develop high-performance batteries tailored for Porsche's sports cars, with a production target of at least 1,000 vehicles per year, starting in 2024 (Porsche AG 2021c).

3.5 Production footprint and platforms

Porsche manages three production facilities for its diverse range of models. As already mentioned, the sportier models, such as the 911, 718, and the all-electric Taycan, are manufactured at the company's headquarters in Stuttgart-Zuffenhausen. The Macan SUV and the Panamera, on the other hand, find their origins in Leipzig. Meanwhile, the Cayenne SUV is manufactured in Bratislava, Slovakia (Porsche AG 2021a). It's noteworthy that the Stuttgart-Zuffenhausen and Leipzig facilities are dedicated exclusively to Porsche production, while the Bratislava facility operates as a multi-brand facility, producing approximately 30k vehicles, 96k gearboxes, and almost 22m components. This range includes vehicles such as the VW Touareg, Audi Q7, Audi Q8, Porsche Cayenne, VW Up, VW E-Up, and the Skoda Karoq (Volkswagen AG 2021). Leipzig recorded the highest daily production rate among the plants in 2021. In total, 71% of Porsche's vehicles are manufactured in their German factories, with the remaining 29% manufactured from the Slovakia facility (Porsche AG 2021a). Taking a closer look at Porsche's platform strategy in the development of electric vehicles, we must first introduce VW, as they play

a key role in accelerating the platform development. VW pursued the strategy of using the same platforms in the various brand groups and vehicle segments in order to increase group synergies and reduce costs. These platform technologies are particularly used in the development of Porsche's SUV models (Volkswagen AG 2021). For instance, the Macan is constructed upon the innovative Modular Longitudinal Platform (MLB), which initially made its debut in the Audi A5 back in 2007. Subsequently, this platform has been extensively employed by various models within the Audi family, encompassing the A4, A5, A6, A7, A8, Q5, Q7, and Q8. In 2015, the MLP underwent an update with the introduction of the MLP Evolution (MLB evo) platform. Additionally, this platform was rolled out to vehicles produced by Bentley (Bentayga), Lamborghini (Urus), Volkswagen (Touareg), and the Porsche Cayenne (Andropoulos 2020). Moreover, to optimize vehicle efficiency, VW has also introduced dedicated platforms for all electric vehicles (Volkswagen AG 2022). For their mainstream models, the company has introduced the Modular Electric Drive Matrix (MEB), while for premium models, they have developed the Premium Platform Electric (PPE). The development of the MEB platform falls under the responsibility of the VW brand, while the PPE architecture is a collaborative effort between Audi and Porsche. Key components shared across these platforms include the battery, charging connector, and drivetrain. To further streamline platforms and enhance standardization, VW intends to launch a new platform called the Scalable Systems Platform (SSP) by the middle of the decade. The SSP is designed as a highly adaptable vehicle platform intended to incorporate models across all brands and segments (Andropoulos 2020). The objective is to increase scalability in terms of hardware, software, batteries, and charging systems (Volkswagen AG 2022). Porsche has also outlined its strategy of first moving the Cayenne and Macan models to the PPE platform in the short to medium term before eventually moving to the SSP platform. In the long term, Porsche will adopt a dual-platform approach, consisting of the SSP platform and the Porsche Sportscar platform (Schrieber 2022). The SSP platform, will be dedicated to high-performance vehicles and is used for limousines and SUVs (Schwuchow 2022). Please refer to

table 1.2 and to *figure 1.4* in the *appendix*, to find a breakdown of the platforms used in the production of Porsche's various models, along with a general summary of the responsibilities each brand holds for the different modular toolkits used within the VW Group.

3.6 Environmental and social impact

Based on the ISS ESG rating, Porsche stands out as one of the top-rated companies in the automotive sector. It has received a remarkable B- rating, placing it in the prime rating range (from A+ to D-, with A+ being the highest rating) (Porsche AG 2021a). Porsche has established the objective of attaining a 50% share of electric vehicles by 2025 and an 80% share by 2030. In 2021, BEV sales represented 13.7% of the total unit sales. Achieving these EV targets are mainly driven by the continued electrification of existing ICEs vehicles and for instance the launch of the all-electric Macan, significantly contributing to Porsche's overall electrification goal (Porsche AG 2021a). If we compare Porsche's EV targets with those of its main competitors, Ferrari is aiming for a BEV share of 40% by 2030, Mercedes wants to drive purely electrically by 2030 and BMW expects at least 50% of total deliveries to be BEVs by 2030. A further comparison between Porsche's EV targets and its peers can be found in *figure 1.5* in the *appendix*. Moreover, sustainability is now among consumers key criteria when purchasing a new vehicle. According to a study conducted by Accenture, 64% of respondents perceived sustainability as important when selecting a new vehicle (Accenture 2021). In fact, Porsche has targeted to reduce its environmental impact by 95% in 2030 compared to 2018 and reduce its environmental pollution per car by 45% until 2025, with the baseline being 2014 (Porsche 2021a). On this note, environmental impact comprises own production activities such as energy consumption, emissions from the power plant, CO_2, air pollutants, water, wastewater and waste (Porsche AG 2021; Porsche AG 2022d). Assessing Porsche's social impact, the majority of Porsche's employees are male (82% in 2021), and this is even more pronounced at the executive level (90% in 2021). However, the ratio is becoming more balanced considering new hires, as

30% of all the new hires were female in 2021. The overall employee turnover rate at Porsche was rather low at 2.4% in 2021 in comparison to Mercedes at 8.7% and Ferrari at 4.1% (Porsche 2021a). This emphasizes Porsche's commitment to be an attractive employer, which is also confirmed by a survey carried out by the German magazine Stern in collaboration with the market research company Statista. According to the findings, German employees ranked Porsche at position four with a score of 84 (on a scale where 100 points represent the best and 0 the worst). Porsche was beaten by Lind & Sprüngli (85.8 points), BMW (85.1 points) and Daimler (84.4 points) (Wolf-Doettinchem 2021).

4. The IPO of Porsche

This section delves into Porsche's motivations for pursuing the IPO, and a review of the IPO process itself.

4.1 Porsche's motives for going public

Porsche's IPO was motivated by a combination of financial and strategic factors. Initially, VW and Porsche underscored the evolving changes taking place in the industry, marked by the transition from internal combustion engines to BEVs (Volkswagen AG 2021). VW's commitment to the electrification of its product portfolio includes a substantial budget of around EUR 73bn according to its 4 years electrification plan from 2021-2025. A substantial portion of the funds raised through the IPOs will be allocated to support the costs associated with the construction of battery manufacturing facilities, invest in future battery technology, autonomous driving software and charging infrastructure (Volkswagen Group 2021). VW's strategy goes beyond immediate profits, as the company plans to distribute 49% of the proceeds obtained from the public offering to shareholders in the form of a special dividend. This transition was a crucial part of VW's shift from a brand-oriented manufacturer to a vertically integrated mobility group (Ward 2022). In addition, the IPO was intended to position Porsche as a luxury company in the

eyes of investors, similar to Ferrari's IPO in 2015. In this way, Volkswagen wanted to ensure that Porsche's valuation would benefit from the premium multiples of the luxury industry (Campbell and Miller 2022). Hence, VW's leadership took several strategic steps. They brought in consultants who had experience with Ferrari's IPO and advocated the selection of luxury companies such as LVHM and Hermes as comparables for the valuation (Boston 2022). Porsche also emphasized that the IPO would enable the company to fully exploit the potential of its brand. Under the umbrella of the VW Group, Porsche was perceived on the market primarily as a conventional automobile company. In addition, Porsche highlighted the benefits of greater independence and entrepreneurial freedom in decision-making processes as key reasons for going public (Ward 2022). Porsche's executive board would be given greater autonomy while maintaining a higher level of accountability. However, the extent of Porsche's board independence would likely remain limited due to the key positions held by board members such as Oliver Blume within the VW and Porsche group structure (Neiger 2022).

4.2 The IPO procedure

On February 22, 2022, Volkswagen issued an ad-hoc announcement, revealing discussions between VW AG and Porsche SE regarding a potential IPO for Porsche AG. This marked the initial steps in the planning of the Porsche IPO (Volkswagen Group 2022b). By February 24, VW announced that the agreed-upon key points for a possible Porsche IPO had received approval from the supervisory board. Subsequently, there was a need to assess the feasibility of the market entry. Upon a public issuance, VW disclosed its intention to distribute Porsche AG's share capital with a 50% allocation to ordinary shares and 50% to preferred shares. VW announced that Porsche SE is set to obtain a stake of 25%, along with one additional share, from the common shares at the designated offering price., along with a 7.5% premium. Moreover, it was revealed that a special dividend equivalent to 49% of the overall proceeds will be distributed among shareholders, upon successful completion of the IPO (Volkswagen Group 2022c).

On July 22, 2022, VW announced the resignation of CEO Herbert Diess and shared that Oliver Blume would assume a dual role as CEO of both Porsche AG and VW AG starting from 1 September (Volkswagen Group 2022d). In an ad-hoc announcement on September 5, it was officially declared that the board, supported by the supervisory board's approval, had decided to list Porsche AG on the regulated market of the prime standard of the Frankfurt Stock Exchange. The market debut was scheduled for September or October 2022. Furthermore, the board and supervisory board approved the breakdown of the share capital, ensuring that Porsche SE would acquire a minority stake with a 7.5% premium (Volkswagen Group 2022e). The share capital accounts for 911m and is split equally. A total of 113,870,000 preferred shares (12.5% of the share capital) were issued on the Frankfurt Stock Exchange and 113,875,001 common shares (25% plus one common share) were being sold to Porsche SE. Initial details regarding the price range and offering structure were disclosed in an ad-hoc announcement on September 18th (Volkswagen Group 2022f). VW communicated that the price for the preferred shares ranges between EUR 76.5 to 82.5 per share. The final price was then determined through the bookbuilding process. In total, 113,875,000 preferred shares were issued, including 14,853,260 preferred shares as part of the Greenshoe option for potential over-allotments. This corresponded to a total issuance volume, including the Greenshoe, of EUR 8.7 to 9.4bn. Additionally, the proceeds from the common shares, including a 7.5% premium, amounted to EUR 9.4 to 10.1bn. Moreover, the whole IPO process was accompanied by a consortium of renowned banks. Goldman Sachs, J.P. Morgan, BofA Securities, and Citigroup acted as Joint Global Coordinators. Deutsche Bank, BNP Paribas, and Morgan Stanley served as Senior Joint Bookrunners. Banco Santander, Barclays, UniCredit Bank AG, and Société Générale acted as Joint Bookrunners. Commerzbank, LBBW, Mizuho, and Crédit Agricole CIB assumed the role of Co-Lead Manager (BaFin 2022). Due to strong demand and limited supply, VW AG, in coordination with the accompanying banks, set the placement price of the preferred shares at EUR 82.5 per preferred share (Köhler 2022).

5. Market Environment

Porsche has a strong presence in three distinct segments of the automotive industry, which include high-performance sports cars and luxury sports sedans, as well as high-end premium SUVs (Porsche AG 2021a). As a result, we categorize the relevant market as encompassing both luxury brands and high-end premium vehicles, positioning Porsche within the luxury automotive sector. Over the years, the luxury car market has shown varying levels of stability in times of economic turmoil. In 2008 and 2009, it experienced a downturn with declining sales figures due to the global financial crisis, only to recover by 2010 and exceed pre-crisis levels. However, the COVID-19 pandemic and the subsequent economic challenges resulted in only a modest setback for the luxury car market (Howarth 2022). Consequently, the luxury vehicle segment has outperformed the global overall car market significantly, growing at double digits percentages, as the overall market experienced a significant lack of growth, remaining mostly stagnant. Nonetheless, luxury cars, defined by a starting price exceeding USD 80k according to IHS/S&P Global and McKinsey data, comprised only 2-3% of total vehicle sales in 2021. However, this segment is still expected to grow much faster than the overall market. Industry data from IHS and McKinsey also suggest that the segment encompassing vehicles priced between USD 80k and USD 500k, where Porsche operates, is projected to grow at a CAGR between 8-14% in the upcoming decade, whereas the total vehicle market is forecast to grow by only approximately 1% (Guan et al. 2022). For a comprehensive breakdown of the luxury car market segmentation by vehicle cost range and its respective CAGRs, as well as a categorized segmentation of Porsche and its competitors in the luxury car segment, please refer to *figures 1.6-1.7* in the appendix. Moreover, the relevant market expanded to approximately 1.5m units in 2021, more than double its size in 2006 (Guan et al. 2022). The primary driver of this growth has been the luxury SUV segment, which accounted for 62% share of the total market in 2021 (Zhang et al. 2022).

Considering Porsche's rich history and iconic models, the company is not just another car manufacturer. While models such as the 718 and Macan may fall into the premium segment, the 911 can be seen as more of a luxury good. Porsche has a clearly defined strategy to further penetrate the luxury segment, and it should benefit from the growing population of High-Net-Worth Individuals (HNWI) and Ultra-High-Net-Worth Individuals (UHNWI) (Porsche AG 2022i). HNWIs are characterized as individuals possessing a net worth equal to or exceeding USD 1m and UHNWIs as individuals with USD 30m or more, including their primary residence (Frank 2022). The worldwide market for luxury goods was approximated to be around EUR 1.2tn in 2021, and is expected to further grow significantly. This growth trajectory is primarily attributed to the expanding population of (U)HNWI, which has grown at a CAGR of 12% and 10%, respectively, from 2016 to 2021 (Zhang et al. 2022). Projections indicate further growth by over 100m and 700k people for (U)HNWI, respectively, in 2026 (Frank 2022). However, UHNWI growth is expected to be slower than the HNWI segment, with a CAGR of 5% between 2021 and 2026, while the HNWI segment is anticipated to grow at 9% in the same period. In terms of regions, China is expected to see the largest growth in (U)HNWI in the coming years, followed by the United States and Europe. In 2021, China, the United States, and Europe collectively accounted for 79% of the total (U)HNWI population (Zhang et al. 2022). The development of (U)HNWI is represented graphically in *figure 1.8* in the appendix. Furthermore, the transition to electrification will be a differentiating factor in the luxury car market. According to McKinsey, BEVs are projected to take the lead in all luxury vehicle categories by 2031. However, the rate of acceptance may differ depending on the pricing tiers. Moreover, the luxury automotive sector is increasingly prioritizing sustainability and environmental considerations. Luxury car manufacturers are increasingly investing in eco-friendly technologies, encompassing carbon-neutral production, renewable materials, and environmentally responsible supply chains. This commitment to sustainability not only addresses consumer demand but also aligns with global climate goals (Guan et al. 2022). In terms of customer demographics, younger, tech-

savvy consumers, particularly millennials and Generation Z, are actively shaping both the broader luxury market and luxury vehicle market. To meet this evolving consumer base, companies are adapting their strategies and product offerings. Also, there is a notable increase in female involvement in the automotive market. According to a study conducted by Oliver Wyman, women are the primary decision-makers in 65% of all new car purchases, and this trend extends as well to the luxury vehicle segment. In fact, female customers outpaced males in car spending, accounting for 20% of new car acquisitions in China during 2021 (Zhang et al. 2022). Porsche incorporates a large base of 2.7m registered customers. However, there are significant differences in gender distribution and average customer age between regions, such as Germany and China. Porsche's customer base predominantly comprises males, with 85%, and females, at 15% and the average customer age in Germany is 50 years, whereas in China, the average age is around 35 years. Hence, Porsche has recognized the potential of also targeting a younger audience as well as female customers seeking a luxury experience. For example, Porsche has employed tennis icon Maria Sharapova and Emma Raducanu as a brand ambassador to reach out to this potential key customer group (Zoeller 2023).

6. Financials Statement Analysis

This section offers a comprehensive overview into our financial and long-term performance analysis. Given the complex nature of the presented data, which can pose challenges when attempting to assess a company’s efficiency and predict its future, it is helpful to reformulate the financial statements for a more in-depth analysis of the fundamental operations and for deriving the value drivers of the company (Petersen et al. 2017).

6.1 Reformulated Balance Sheet and Forecast

The reformulation of the balance sheet categorizes Porsche’s total assets and total liabilities into three segments: core invested capital, non-core invested capital, and financing business,

offering a more insightful view of its invested capital within its core and non-core operations. The core invested capital primarily encompasses fixed assets, including property, plant, and equipment (PP&E), intangible assets, leased assets, and other crucial components such as tax assets, tax liabilities, and Porsche's working capital.

Capitalized development costs for products in use, expenses related to products under development for smart mobility, software and licensing assets, and goodwill make up the category of intangible assets. Notably, the compounded annual growth rate of intangible assets stood at 8% between 2018 and 2021. This surge can be attributed to the capitalization of R&D expenditures, a practice that has boosted Porsche's margins over recent years. This share of capitalization has exceeded 65% in 2021. With the launch of the new Macan BEV in 2024 and Porsche's 2030 strategy, this trend of high capitalization is expected to persist until 2025. Beyond that horizon, amortization is projected to outpace capitalization in absolute terms. Intangible assets are derived from past records, representing 18.6% of generated turnover, and is driven by Porsche's continued emphasis on digitalization as a key factor for future growth (Porsche AG 2021a).

Within the category of PP&E, there are components such as buildings, land (rights), machinery, fixtures, advance payments for assets under construction, technical equipment, and furniture (Porsche AG 2021a). PP&E is forecasted based on the ratio to generated turnover which remains steady at 28.5% since we assume spendings for new machines and manufacturing facilities. (Porsche AG 2021c). Leased assets consist of vehicles leased to customer. Impairment losses from these contracts for leased vehicles are shown in Porsche's consolidated financial statements (Porsche AG 2021a). This line item is as well forecasted based on its 2021 ratio of revenue, accounting for 11.9%, and is held constant throughout the forecast period.

Porsche's NWC encompasses balance sheet items such as operational cash, financial services receivables from its leasing business, inventories, trade receivables and trade payables. We determine that 2.5% of the total sales is necessary for operational cash requirements, which is to remain constant. It can be assumed that an operating cash ratio of 2.5% to sales according to

the McKinsey benchmark is a healthy assumption (Babel et al. 2012). To forecast NWC elements, we are computing the cash conversion cycle, including the average holding period, average collection period, and average payable period. Starting with Porsche's financial services receivables, which is related to the average collection period of its financial services business. This item is forecasted by dividing financial services receivables by its respective generated financial service revenue. This ratio has increased at a 3-year CAGR of 23.9% from 402.6 to 550.2 days. This is due to the fact that Porsche's financing and leasing business is also increasing, which is in line with the future growth of its business model. The historical three-year average of 460.3 days is used as the best measure for the forecasted period. Moving on to the average holding period, the balance sheet item inventories are analyzed (Porsche AG 2021a). Inventories are divided by its costs of sales multiplied by 365 days. This Ratio indicates the number of days on average that inventories remain in the company before being sold and amounts to 67.9 days in 2021. Compared to its key peers such as Mercedes (75.9) and Ferrari (94.8), Porsche is able to sell its inventories faster. The three-year historical average of the holding period, amounting to 71 days, serves as the basis for projecting inventory turnover. The average collection period indicates how many days it takes for Porsche to collect sales from clients and is derived from trade receivables divided by total automotive revenue. Porsche's efficiency in quickly collecting payments from clients is evident in its historical three-year average of 12.1 days, outperforming again its peers Mercedes (23.8) and Ferrari (20.1) in this aspect. Trade payables, reflecting the time taken to settle obligations with suppliers, have seen a notable decline. This decrease, attributed to evolving market dynamics, is not seen as a weakening of Porsche's bargaining power but rather a response to market conditions. As such, the three-year historical average of the payable period, standing at 50.1 days, is used for forecasting trade payables. Analyzing not only the activity ratios but also the liquidity ratios of Porsche we saw a clear improvement in the analyzed time span for all three ratios. While the current ratio increased from 0.93 to 1.42, the quick ratio and cash ratio increased from 0.60 to 1.07 and 0.22

to 0.36, respectively. In fact, this improvement in all three mentioned ratios shows that Porsche is constantly improving its capabilities of meeting short-term obligations.

Balance sheet items, collectively referred to as "tax positions," include four components (Porsche AG 2021a). These four components show relative stable historical development, with fluctuations being minimal. As a result, the forecast is straightforward, based on its three-year historical average as a percentage of sales.

Other receivables, other liabilities, other provisions, as well as tax provisions, are also considered to be items of Porsche's core invested capital operations since these items are direct associated with day-to-day operations and are forecasted as a percentage of revenue. Among these, other receivables encompass receivables linked to long-term construction contracts, corresponding to contract receivables from customer contracts, for instance. Hence, they are considered to be part of the core business. Similarly, other liabilities include advance payments received for orders that are based on contractual obligations from customer contracts and are categorized under advance payments received for orders. This item also encompasses deferred income, including special rent payments and other deferred income, and is estimated based on a three-year historical average of 6% (Porsche AG 2021a).

Moving on to the non-core invested capital segment, this part includes provisions for pension and similar obligations, other financial assets, other equity investments, securities and time deposits, equity-accounted investments as well as other financial liabilities. Taking a closer look in the non-core invested capital segment of Porsche there are three items noteworthy.

First, provisions for pension and similar obligations encompass financial arrangements related to retirement benefits for Porsche's employees. Notably, a drop of 6.9% in 2021 in this item is attributed to the reduction in the present value of unfunded benefit obligations, primarily driven by changes in financial assumptions. Those assumptions are related to the adjustment in the discount rate which increased from 0.8% to 1.4%. (Porsche AG 2021a). The expectation for this trend is to persist, demonstrating a consistent 2% growth rate until 2033 based on the two-

year historical average. Second, other financial assets include derivative financial instruments and increased significantly with a CAGR of 9.3% from 2018 to 2021 (Porsche AG 2021a). The increase is mainly due to a short-term loan of EUR 2m provided to VW AG in 2021. However, we expected other financial assets to grow constant at a low percentage of 1% to stabilize future growth in the forecasted period. Lastly, other financial liabilities include long-term financial liabilities (Porsche AG 2021a). This item has increased on a YoY growth rate by 31.7% in 2021A, which is associated with adjustments made to derivative instruments and adjustments made to additional share purchases obligations. Hence, we assume that this item will grow at a constant rate of 5.3% from 2022, based on its historical average.

Turning to the financing part of the reformulated balance sheet, Porsche's net debt comprises financial liabilities, non-controlling interest, and excess cash. Excess cash is computed as the difference between cash & cash equivalents and operational cash. Porsche's historical net debt development is anticipated to gradually grow with a CAGR of 6.8%. Moreover, Porsche's D/E ratio of 25.6% in 2021 is a key factor in calculating its weighted average cost of capital which is introduced later in this study. It is assumed that this ratio will remain constant at 25.6% over the forecasted period, ensuring financial stability, predictability in financial planning and lower risks related to sudden changes in debt. Projected equity is determined by aggregating the preceding year's equity, the transactions involving shareholders, and the anticipated comprehensive income. The latter is determined by considering Porsche's payout ratio multiplied by the forecasted comprehensive income. (Porsche AG 2021a).

In assessing Porsche's capital structure, the reformulated balance sheet is serving us with the necessary data to compute three ratios providing meaningful observations about the company's financial structure and health. First, the gearing ratio reveals the proportion of invested capital financed through net debt. (Lenglet 2022). This ratio increased from 19% in 2018 to 20% in 2021 indicating that Porsche is using more of its debt to finance its core operations. Second, Porsche's D/E ratio represents a similar increase, standing at 25.6% in 2021. Indeed, both ratios

are within similar ranges, indicating that Porsche is operating at an optimal capital structure, regarding the parameters risk and return. For the solvency ratio, banks favor institutions with a ratio of 0.5 and prefer those with a ratio above 1. Porsche as a large corporation with steady cash flows, shows a ratio of 0.56 indicating that it is able to meet its long-term liabilities and is at no risk in an event of an economic crisis (Chasanah and Sucipto 2019).

6.2 Reformulated Income Statement and Forecast

The income statement is a crucial part of the financial statement analysis that provides an overview of a company's profitability over a specific period. Furthermore, it can be used to analyze and assess the key value drivers within an organization. (Damodaran 2012). The income statement can be also divided into core operations, non-core operations, and financial operations. Additionally, this reformulation includes a tax breakdown, shedding light on the total taxes paid by each segment of the business.

Porsche's core operations in the income statement, encompassing items such as revenue, cost of goods sold (COGS), administrative expenses, distribution expenses, and other operating income and expenses. The key value driver for Porsche's core operations is its revenue, generated through two primary business segments: the automotive business and financial services business. As of 2021, Porsche's revenue structure is dominated by the automotive segment, which accounts for 91% of total revenue, while the financial services business only contributes 9% to revenue (Porsche AG 2021a). To forecast total revenue for Porsche, we model the business in two segments: automotive business and financial services business.

Within the automotive segment, the forecasted top-line growth is primarily driven by the volume of vehicles delivered and its respective pricing, which is based on our growth assumption and the computed average selling price for each vehicle. To analyze the historical data and form our assumptions, data and information’s are used from Porsche's annual reports and various available market reports. Since 2018, Porsche has experienced consistent growth in total vehicle

deliveries, achieving a CAGR of 5.6%. As of 2021, they successfully delivered 302k vehicles, demonstrating a robust demand for Porsche cars, surpassing their luxury competitors (Porsche AG 2021a). Notably, Porsche outperformed renowned luxury brands such as Ferrari (11k vehicles delivered), Lamborghini (8k vehicles delivered), Aston Martin (6k vehicles delivered), and Maserati (24k vehicles delivered). Indeed, Porsche is outperforming its luxury peers by far, however still remains far mor exclusive than premium OEMs such as Mercedes (2m vehicles delivered), BMW (2.5m vehicles delivered) and Volvo Cars (0.7m delivered). Porsche faced some initial challenges in profitability due to the launch of their BEV model Taycan in 2019, including associated costs during the ramp-up phase, particularly in 2020. The latter year was obviously also impacted by COVID-related costs (Porsche AG 2020). That being said, profitability of the automotive division has recovered since then, moving on an upward trajectory. Given that Porsche benefits from VW Group's investments in BEVs, and the successful introduction of their first BEV to the market, we expect that margin dilution in the near term should be limited. Following the model cycle and based on historical deliveries, management assumptions made in the annual report and the evolving market environment of the automotive industry, we expect volume delivery growth and average selling price of each product line to face different stages of future development. The average selling price for each product line is calculated based on using the data from a renowned automotive magazine called "Car and Drivers". This magazine includes a detailed database over two decades covering various car manufactures, making it possible to find historical selling prices for each vehicle (Car and Drivers 2022). For further details about the average selling price per vehicle and its respective generated turnover, please refer to table *1.3-1.4* in the *appendix*.

Moreover, we ran several linear regressions using various independent variables such as the Stoxx Europe 600 Automobile Index, the average price of sports cars, the GDP, the consumer price index, the EUR exchange rate and the share of electric cars against Porsche's generated sales as the dependent variable. This method allowed us to examine various potential drivers of

Porsche sales, including industry performance, economic indicators, and market-specific factors. Please refer for further details and the results to *figure 1.9* in the *appendix*.

Starting with the iconic 911. We note that the 911 has the highest base price across the different Porsche models and the most expensive top-end version. Moreover, almost all the special series are related to the 911, which is the brand-shaping model of the company (Porsche AG 2021a). We analyzed the 911 deliveries over the last years and noted that volumes tend to be rather stable. Indeed, once a new model is launched, annual deliveries move by around mid-single digits YoY, which is rather stable for the sales of just one model and therefore meeting the criteria of a luxury good. Volumes typically only move by double-digits once a new model is introduced. On average, 911 deliveries reached 35,8k units over the last four years, with 2021 marking a new high at 38,5k units. Based on historical new launches we expect this pattern to continue in the forecasted period, with new 911 model launches every four years, which might reach mid-single digits YoY growth of 10%. During the time period up to the next launch, we assume that deliveries are steady at 0.5%. The average selling price is set at 7% until 2026 which is consistent with the average market CAGR of the (U)HNWI end-market. Afterwards the selling price will decrease to 2% until 2033 to stabilize the future growth of the company.

The 718 product line has witnessed a decrease in deliveries over the preceding three years from 24k to 20.5k deliveries. Furthermore, the implied vehicles sales of the 718 product line accounts for just 4.9% of total revenue in 2021. Hence, we expect that volume in deliveries will further decline in the forecasted period by 0.5% until 2026FC. This decline is also attributed to Porsche's decision to discontinue the 718 GT4 and 718 Spyder. However, Porsche's mid-term strategy includes the introduction of a new electric 718, set to arrive mid-decade accelerating its goal of increasing its BEV market share to 80% by 2030 (Misoyannis 2023). Consequently, we expect deliveries to stabilize in 2027 and remain constant thereafter at rate of 2%. Its respective average selling price is forecasted based on the long-term expected inflation rate of 2%.

Porsche's SUV offerings, namely the Macan and Cayenne, have been key drivers of the company's high deliveries and revenue. Going back in history, Porsche was among the first luxury OEMs to launch an SUV. In 2002 it launched the Cayenne, becoming the OEM's best-selling model until this position was taken by the Macan in 2015 (Porsche AG 2022f). In 2021, the two SUVs accounted for 56.8% of total volume deliveries and contributed together 37.9% of total revenue. In fact, both SUVs were besides the 911 the key drivers of high deliveries and revenues in the past and anticipate a continuation of this pattern. According to a conducted study by McKinsey in 2022, about half of potential premium and luxury car customers indicate a preference for a SUV as their next purchase. On this note, the same study concluded that over 70% of current premium and luxury car owners would switch to an EV, which supports Porsche's strategy to launch a luxury SUV such as the Macan BEV by 2024 and the Cayenne BEV by 2026 (Guan et al. 2022). Following on from that, to forecast the SUVs delivery growth, we expect that both models will continue to develop similar until 2026. Therefore, we apply a constant growth rate of 5%. Afterwards we expect a decline in terms of deliveries, with the Macan growing further at 2% and the Cayenne at 1% taken its history into account that the Macan continues to be the preferable Porsche SUV in the end-market.

The Panamera, positioned as a higher based priced model within Porsche's portfolio, accounted for 9.7% of total revenue in 2021. However, it historically experienced a decline in deliveries from 38.4k units to 30.2k units. Since the Panamera is currently solely available as an e-hybrid model and Porsche announced not having immediate plans to replace the Panamera by a BEV model mid-decade, we expect deliveries to follow a growth of 2% until 2026 and then declining further to 1% in the forecasted period due to uncertainties surrounding the transition to BEV production (Porsche AG 2022g). Its average selling price is calculated in a two-stage process growing by 5% until 2026, reflecting Porsche's relation to the end consumer market (U)HNWI, then remaining stable until 2033 with a growth rate of 1%.

Lastly, about two years post-launch, the Taycan has yielded positive results. Despite its relative newness, the Taycan maintains a strong demand and healthy pricing. To perform a realistic forecast, we are not relying on the historical two years YoY growth of deliveries which would amount to an average of 1,253.3%. Hence, our forecast for the Taycan incorporates constant growth in volume deliveries and average selling price of 2% during the forecasted period.

Moreover, we forecast continuous price increasements that lift the average selling price, complementing Porsche's future pricing power, which is mainly driven by its brand power. Furthermore, the increased pricing strategy also aligns with market trends among (U)HNWI which are assumed to be Porsche's end-consumer. The overall development of the average selling price per vehicle and its respective turnover during the forecasted period can be found in *figures 1.10-1.11* in the *appendix.*

Apart from the automotive business, Porsche's financial services division includes income from leasing and rental activities, as well as interest income (Porsche AG 2021a). This segment is set to 10% in 2022 and is expected to gradually decline to 2% until 2033. This likely reflects a strategic realignment and changing market dynamics. Overall, total revenues are experiencing steady top-line growth, growing mid-term until 2026 with an average YoY growth rate of 8%. This rate is in line with the company's target of achieving a top-line growth between 7-8% in the mid-term. Moreover, the company's ROS is targeted between 19% and 20% in the long-term, which is achieved in steady state at 24.5% ROS based on our assumptions (Porsche AG 2021a). The long-term performance of Porsche including its key performance metrics are shown in *figure 1.12* in the *appendix*.

Moving on to the COGS, this line item constitutes a significant portion of Porsche's expenses, covering various operational-related costs (Porsche AG 2021a). Historically, COGS has averaged at around 73.4% of total revenue, being relative constant. However, the gross margin experienced a slight impact due to the COVID-19 pandemic, evident in COGS as a percentage of automotive sales, which saw a slight uptick to 74.5% in 2019 and remained at 73.7% in 2020,

still surpassing the historical average. Influencing factors, such as the escalation of raw material expenses and disruptions in the supply chain from 2021 onwards contributed to these increased costs. However, the expected decrease in COGS as a percentage of revenue during the forecasting period is attributed to Porsche's resilience, effective cash flow management, robust supplier relationships, and managerial capabilities. Those reduction are expected in the midterm and are driven by digital development improving Porsche's construction and production. Hence it is expected that COGS account for 70% of total revenue until 2026 and then decrease to 65% in the forecasted period.

Porsche's SG&A expenses are recognized under the item’s distribution and administrative expenses. Throughout the last three years, distribution expenses, encompassing personnel costs, partial depreciation and amortization, non-staff overheads, shipping, advertising, and sales promotion expenses, consistently represented 7.5% of revenue. We expect this ratio to remain constant until 2026 and then decrease to 7%. Administrative expenses, encompassing various costs related to the administrative function, have historically represented 4.3% of revenue and is anticipated to remain also consistent at this level until 2026 and then further decrease to 3.5% (Porsche AG 2021a). Another contributor to revenue growth stems from other operating income, encompassing gains from foreign exchange transactions and income generated from other hedges, including derivative financial instruments. Historically, this item has shown a steady average growth of 3.2% which we expect to continue. In contrast, other operating expenses involve foreign exchange losses, and based on the historical data we expect that these losses remain constant at 3.7% of revenue (Porsche AG 2021a).

Porsche's income statement doesn't break down D&A expenses as an individual line item, instead, these costs are derived from the consolidated cash flow statement., representing 9.5% of revenue and 36% of PP&E in 2021. We forecast D&A based on its historical average in percentage of PP&E, with D&A accounting for 35.2%. Following this, EBITDA can be calculated by adding back D&A to the core pre-tax result. The respective margin is expected to grow from

23.6% to 34.5% in the forecasted period, highlighting its robust profitability. Including tax adjustments, the net margin of its core business is projected to increase from 9.4% to 17.2% in the forecasted period, reflecting the company's ongoing efforts to reduce costs incrementally.

The non-core business encompasses equity accounted investments and other financial results. These items have historically remained relatively constant, and we expect them to follow historical averages. Calculating the total non-core result involves subtracting total taxes paid and adding other comprehensive income (OCI). OCI includes other profits and losses that are not realized and may be excluded from net income such as such as foreign currency translation adjustments, cash flow hedges and unrealized gains/losses on derivative instruments (Porsche AG 2021a). The changes in this category, from EUR -753m or -2.9% of total revenue in 2018, to EUR +64m or 0.2% of total revenue in 2021, are primarily driven by pension plan remeasurements already mentioned in the previous part where the discount rate increased in 2021 to assess the present value of unfunded provisions for pension and similar obligation.

Lastly, financial operations encompass Porsche's interest result, which is broken down into interest income and interest expenses. Porsche's strong affiliation with VW, enables the company to maintain a positive interest result, which is also expected to remain stable where interest income is forecasted in percentage of revenue at 1.4% and interest expenses are forecasted in percentage of its previous year debt at 2.9%. In conclusion, Porsche's financial outlook is shaped by a combination of historical patterns, strategic shifts towards BEVs, pricing power, and ongoing initiatives to control costs.

6.3 Free Cash Flow

The cash flow map provides a comprehensive summary of the previous conducted analysis. It breaks down the financial statements into different cash flows, distinguishing between those derived from the core and non-core businesses. This analysis extends to historical and projected figures. Accurately calculated, the model establishes a direct relationship, ensuring that the

financing cash flow precisely mirrors the opposite of the combined calculated free cash flows. Porsche has substantial positive FCFs over the forecasted period, and we assume that profitability and attractiveness of Porsche will further increase. Moreover, from 2022 to 2026, sales are projected to expand primarily driven by pricing strategies, occurring with an accelerated inflation rate. This growth will lead to increased capital expenditures within the core invested capital, as many balance sheet items are tied to sales. Consequently, the total FCF during this period is expected to decrease and experience relatively modest gains. Another driver for increased capital expenditures is the necessity to invest in future technologies, such as autonomous and electric vehicles to achieve its target. However, beyond 2026, we anticipate a shift. The rate of capital expenditures in relation to sales is expected to decrease. This transformation is rooted in the fact that Porsche's growth will be price-driven, accompanied by consistent or even reduced vehicle production.

6.4 Long Term Performance Analysis

To evaluate a company's performance and success, it's crucial to delve into its business segments and calculate their respective Return on Invested Capital (ROIC) (Berk and DeMarzo 2019). ROIC is typically computed through the division of the core result by the invested capital from the previous year. Historically, according to a McKinsey Study, a ROIC of around 15% was typical for the automotive sector (Jiang and Koller 2006). Porsche's automotive division ROIC has slightly fluctuated, reaching 22.3% in 2021 and a low of 19.8% in 2020, likely due to supply chain disruptions and decreased demand during COVID-19. The increase is mainly attributed to rising operating profit. Similar fluctuations can be observed in the financial services division, with a ROIC at 14.1% in 2021 and a low of 9.7% in 2020. Hence, Porsche's core business achieved a ROIC of 18.2% in 2021, surpassing the industry average, indicating efficient capital allocation to profitable investments. The total ROIC for Porsche in 2021 stood at 16.6%. Based on our forecast and assumptions, we anticipate that Porsche's ROIC will stay

relative stable and experience a slight increase to 18.9% by 2033. The increase is attributed to enhanced operational efficiency, strategic investments, improved market positioning, and effective financial management. However, ROIC does not consider a company's financing, so other key performance indicators such as return on equity (ROE) must be used to obtain a more comprehensive view of shareholder returns. ROE reflects the return to shareholders and can be calculated for each division or investment unit within the company. It represents the ratio of comprehensive result to common shareholder equity. Unlike ROIC, ROE doesn't consider the capital from the previous period, focusing solely on the return achieved for shareholders (Penman 2013). ROE can be calculated in three ways: as a weighted average of returns from operations and financing costs (Level 1), by subtracting the difference between financing costs and ROIC multiplied by D/E from ROIC (Level 2), or as the sum of the ROE for core, non-core, and financing activities (Level 3). All three methods yield the same results for Porsche's total ROE, which stood at 17.9% in 2021. Moreover, the ROE for each segment steadily increased from 2018 to 2021, reaching a high of 19.4% in the automotive division and 17.5% in the financial services division. This growth was driven by an increasing ROIC, resulting from rising invested capital while equity also increased. Our forecast suggests an increase in total ROE to 22.8% by 2033, primarily due to its increased profitability and optimized capital structure. Moreover, to assess Porsche's value creation and key drivers, it's crucial to consider the cost of capital, which stood at 8.8% in 2021. This metric will be further detailed in the following section. The ROIC, the inverse metric of the cost of capital, measures profit relative to invested capital. When ROIC surpasses the cost of capital, value is created, while falling short indicates value destruction. This difference is also known as Economic Value Added (EVA) (Petersen et al. 2017). In fact, EVA is positive from 2018 (5.3%) to 2021 (7.7%), which implies that Porsche generated constantly value.

Alongside the growth rate and the investment rate of new capital, it is crucial to also contemplate the Return on New Invested Capital (RONIC). The RONIC is calculated by dividing the

change between the current and previous profit by the change between the previous invested capital, which is the new invested capital. This allows us to deduct not only a company's value creation but also its trajectory toward a steady state (Damodaran 2012). The investment rate has been high, at 46.9% in 2021, but is expected to decrease in the future, to 17.1% in 2033. This suggests Porsche has made substantial investments in recent years, but these investments are likely to decrease in the future. Overall, our analysis indicates that Porsche is able to exceed the WACC, potentially positively impacting its share price.

7. Valuation

In this section of the paper, Porsche's intrinsic value is to be determined. For this purpose, various company valuation methods are used so that comparability from multiple financial perspectives is ensured. The overall picture among all valuation methods used enables a reasonable assessment of Porsche’s target share price. The chosen valuation approaches are Discounted Cash-Flow (DCF), Adjusted Present Value (APV), as well as Comparable Companies (CCA) and Comparable (Precedent) Transactions Analyses (CTA).

7.1 Key metrics for Valuation

This section concentrates on the derivation of relevant peers and the WACC. The WACC requires several steps as input, including an equity and debt cost of capital analysis, and a country risk premium approximation. In the following, the cost of capital is computed and derived by applying traditional financial theories such as the Capital Asset Pricing Model (CAPM).

7.1.1 Peer Benchmarking

Peer benchmarking is a crucial aspect of evaluating a company's performance and positioning within its industry (Rosenbaum and Pearl 2009). In the case of Porsche, the companies positioning within the automotive industry is situated between luxury OEMs characterized by

relatively low unit sales (less than 10k units) and premium OEMs with substantial sales volumes exceeding 1m units (Guan et al. 2022). Furthermore, we are considering Porsche also as a luxury brand which is why we are expanding our potential comparable universe to the whole luxury and goods market. The selection of peer companies for benchmarking Porsche involves a comprehensive assessment based on two primary groups of criteria: the business profile and the financial profile.

The criteria for assessing the business profile encompass industry specifics, product and service offerings, customer and end markets, distribution channels, geographic location, and compliance with carbon dioxide emissions regulations. These factors hold heightened significance within the automotive sector compared to the broader luxury market. The financial profile criteria include key figures such as company size, profitability, growth profile and credit profile, which are essential for identifying comparable companies with similar business core characteristics to Porsche. In this selection process, various sources such as databases, annual reports, press releases and company presentations are used to identify and screen potential companies (Rosenbaum and Pearl 2009). After a careful screening and evaluation, a peer group was finally built. It comprises 13 automotive and 9 apparel and accessories peers, each with different relevance rankings based on the selection criteria. This enabled a clear differentiation of relevant peers from the wider pool of peers that is used for the valuation methods we applied. In summary, Porsche's positioning within the automotive and luxury industry, is marked by distinct revenue streams, model range offerings, and emissions regulation compliance strategies. Please refer for the selected comparable universe to *table 1.5* in the appendix. Moreover, we conducted various comparison between Porsche and its luxury and premium automotive peers. Further details can be seen in *figure 1.13-1.16 in the appendix*.

7.1.2 Cost of Equity

This part concentrates on determining the Cost of Equity r_E by estimating the market portfolio to gather information about the Market Risk Premium (MRP) and estimating Porsche's equity beta (β_E) based on its comparable competitors. The CoE should explain the best expected return in the market on investments with similar risk, which is possible to derive through the application of the CAPM. The CAPM indicates the similar risk for investments if the sensitivity to the market, measured as beta (β_i). The CAPM equation can be expressed as follows:

$$r_i = r_f + \beta_i \times (E[R_{Mkt}] - r_f) \tag{1.1}$$

where r_i represents the required return for security i, r_f the risk-free interest rate, β_i the beta of investment i with respect to the market portfolio and $E(R_{Mkt})$ the expected return of the market. As for this paper, we adjust the CoE formula for the country risk premium (CRP). This is reasoned by the fact that Porsche's sales are split all around the world and therefore, we adjust for political instability, economic risks, default risk, and currency fluctuations. The used formula for our equity cost of capital approach can be expressed as follows:

$$Cost\ of\ Equity = r_f + (\beta_i \times ERP) + CRP \tag{1.2}$$

where ERP describes the equity risk premium and CRP the country risk premium. The risk-free interest rate r_f is determined by using the yield of a country treasury security, in this case government bonds, and corresponds to the rate, at which investors can both borrow and save (Berk and DeMarzo 2019). This is due to the fact that government bonds are free of default risk. Since Porsche is headquartered in Germany, German government bonds are the right approximation as risk-free interest rate. In this instance, we utilize the 10-year German government bond maturing on 15-Aug-2033 (ISIN: DE000BU2Z015) as a benchmark. The yield of the chosen bond equals to 2.927%. For the estimation of Porsche's implied levered beta β_i, we are using the calculated FY22-H1 D/E-ratio of 33.1%, derived from dividing the assumed net debt of EUR 6,205.5m by the equity of EUR 18,774m. Furthermore, we assume a statutory corporate tax

rate of 30% for Germany (Damodaran 2022). Porsche's implied unlevered beta is derived from the average unlevered betas of our peer group of automotive manufacturers as well as apparel and accessories. Hereby it was necessary to exclude strongly deviating peers, which resulted in a final peer group for the automotive peers of Aston Martin, BMW, Ferrari, Mercedes-Benz, Tata Motors, Tesla and Volvo Car. This is due to the fact that including peers such as Volkswagen or Stellantis would distort our analysis since the groups have several subsidiaries and therefore largely include companies that are not part of the sports car segment. As we therefore did not have a large enough comparison base of peers, we furthermore included a selected peer group of the apparel and accessories industry of Burberry, Richemont, Hugo Boss, Kering, LVMH, Moncler and the Swatch Group. More on the selection process and criteria for our peer group can be found in *7.1.3 Peer Benchmarking* and *7.4 Valuation Approach #3: Comparable Companies*. As we are calculating the average beta for Porsche, we are weighting the two final selected industry peer groups each by 50%, leading to an implied unlevered beta of 0.92. The summary of the beta analysis is shown in *table 1.6*. Calculating the levered beta β_i can be expressed as:

$$\beta_i = \beta_u \times (1 + (1 - t) * \left(\frac{D}{E}\right)) \tag{1.3}$$

Where β_u represents the unlevered beta, t corporate tax rate and $\frac{D}{E}$ the Debt-to-Equity ratio. This results in an implied levered beta of 1.12. As a benchmarking comparison to this approach, please refer to *figure 1.1.7* in the *appendix* for beta regressions of the selected WACC peers. The equity risk premium is derived from the country lookup from Damodaran and equals to 6.01% for Germany. Deriving the country risk premium leads us to Porsche's geographical sales split for FY22-H1, which was retrieved from Refinitiv Workspace. The country risk premiums for the individual regions are 0.99% for China, 1.38% for Europe excluding Germany, 0% for Germany and North America and 5.64% for the rest of the world. The hedges sales revenue CRP is assumed to be 0% because hedges are used to offset risks rather than introducing

additional country-specific risks. By multiplying the % share of the sales split with the respective country risk premium, we can assume a weighted country risk premium of 1.2%. Applying the cost of equity formula to the derived factors results in a cost of equity r_E of 10.9%.

7.1.3 Cost of Debt

The primary emphasis of this part lies in the estimation of cost of debt r_D. This figure pertains to the financial expenditure a company incurs in servicing its debt obligations. Considering that fact that Porsche does not have outstanding debt and only variable, not publicly available interest rates on their outstanding loans, we have decided to calculate r_D through estimating the Yield to Maturity (YTM) of selected comparable companies as well as Porsche's parent company Volkswagen. Information about outstanding debt was obtained from Refinitiv and limited to debt maturing between 2030-2033 (maturity of 7-10 years), except for comparables not having debt maturing during this time (see *figure 1.18* in the *appendix*). The formula for calculating the Yield to Maturity YTM can be expressed as:

$$YTM = \frac{C + \frac{FV - PV}{n}}{\frac{FV + PV}{2}} \tag{1.4}$$

where C describes the Coupon Payment, FV the Face Value, PV the Present Value and n the number of compounding periods. To account for the riskiness and default probability of the bonds, we adjust the YTM as following:

$$YTM\ default\ adj. = YTM - p \times L \tag{1.5}$$

where p is the probability of default based on the bond rating and L represents the expected loss rate. For the annual average default rates by debt rating, we refer to Berk and DeMarzo. Assuming a 60% average loss rate for unsecured debt forms the basis of the calculation (Berk and DeMarzo 2019). Through estimating the default adjusted YTM, it is common to weight the YTM of each comparable company by their percentage share of all selected outstanding bonds.

The weighted average YTM over the two peer groups therefore results to a pre-tax cost of debt of 3.4%, subtracting the German statutory tax rate of 30% results in an after-tax cost of debt of 2.4%. The results are shown in *table 1.7*.

7.2 Valuation Approach #1: Discounted Cash Flow

At the core of financial valuation methods, the DCF approach is widely embraced for determining the present value of projected cash flows. The procedure encompasses projecting the expected cash generation of a business over a duration and then adjusting those cash flows to their present value using a suitable discount rate, the WACC. Utilizing the time value of money as a key consideration, this method supports the evaluation of the underlying value of a company, project, or investment (Berk and DeMarzo 2019). It is used in financial analysis, investment decisions, and business valuation to make informed choices (Petersen et al. 2017). Moreover, the forecasted period comprises a suitable duration which will be between 5 and 10 years, where the company either outperform or underperform growth trends (Koller et al. 2020). For Porsche's financial forecast, we have used a 10-year time span to capture a holistic view that includes longer economic cycles, industry trends and the time necessary for strategic initiatives to influence operations, investments and its market position. The terminal phase represents the estimated value of a business or investment at a specific point in the future, commonly encompassing a considerable portion of the enterprise's overall value. When calculating the terminal value within a DCF analysis, the Gordon Growth Model can be used, assuming perpetual cash flow growth at a consistent rate. However, the DCF analysis is sensitive to the Gordon Growth rate and to the assumptions made because small changes in this rate can significantly impact the estimated terminal value and, consequently, the overall valuation (Damodaran 2012). The equity value is then determined by deducting the net debt and minority interests from the EV (Berk and DeMarzo 2019). We can express the DCF model as follows:

$$Enterprise\ value_0 = \sum_{t=1}^{n} \frac{FCFF_t}{(1+WACC)^t} + \frac{FCFF_{T+1}}{WACC - g} \times \frac{1}{(1+WACC)^T} \quad (1.6)$$

Under our proposed assumptions and discounting the sum of the computed cash flows at a rate of 8.8%, the DCF model yields an estimated EV of EUR 93,267.1m upon its IPO conducted on the 29 of September in 2022. Furthermore, when subtracting both net debt and minority interests, the estimated equity value amounts to EUR 81,368.6m which results in an implied share price of EUR 89.3. Through extensive sensitivity analyses and scenarios encompassing both pessimistic and optimistic cases, we assessed the impact of variables and growth rates on the DCF valuation outcome, recognizing its high sensitivity to assumptions. The performed DCF valuation results as well as the respective sensitivity analysis and scenario analysis are show in *table 1.8-1.12* in the appendix.

7.3 Valuation Approach #2: Adjusted Present Value

Among the DCF, the APV valuation approach is also employed to determine the intrinsic value of Porsche. Nevertheless, the APV method incorporates the discounting of free cash flows, alongside future tax benefits, in contrast to the DCF method. Hence, the APV is using the unlevered cost of equity, accounting to 8.9%, to discount the FCF instead of the WACC. In considering the terminal growth rate, we adopt the same growth rate as applied in the DCF, resulting in an implied EV of EUR 93,643.3m. Subtracting net debt, an implied equity value of EUR 81,744.9m is derived which results in an implied share price of EUR 89.7. Please refer for the results to *table 1.13-1.14* in the *appendix*.

7.4 Valuation Approach #3: Comparable Companies

For a consistent relative valuation through comparable companies, a peer group of selected companies from the automotive as well as luxury brands from the apparel and accessories industry was chosen. The strategic rationale behind including luxury brands to our valuation was

due to the fact that selections from the automotive OEM industry were not significant enough to perform a comparable valuation solely based on a few suitable peers. As Porsche can be attributed luxury inside and outside of the car, and also offers lifestyle apparel and accessories through their online shops, e.g., through Porsche Design and selling products in the likes of timepieces, eyewear, bags and luggage and fashion accessories.

The entire peer group of companies consists of 13 automotive peers and 9 from the apparel and accessories industry. Finally, our selection for the CCA includes Aston Martin, BMW, Ferrari, Mercedes-Benz and Volvo Car, as well as Burberry, Dior, Richemont, Hugo Boss, Kering, LVMH, Moncler and Swatch Group. For the analysis, we relied on three multiples: EV/Sales, EV/EBITDA, EV/EBIT. The rationale behind this is to exclude highly deviating multiples in the two peer group industries such as P/Book, P/E, PEG and EV/FCF. For comparables to be included, they needed to show not highly deviating multiples over the time horizon of FY18-FY21 as well as no average EV/EBIT multiple under 5x and above 30x. For the automotive peers, we excluded Stellantis, Tata Motors, Tesla and VW. VW was excluded due to the fact being the parent company of Porsche and therefore not making sense to include. Stellantis and Tata Motors was excluded because they show extremely low, even negative multiples, and Tesla shows to high multiples to be included in the analysis. Even though Aston Martin does not fit into our EV/EBIT limitation, we included it because it is one of the most comparable companies in terms of product offerings and sports car vehicles. Nevertheless, Aston Martins negative multiples are not considered in the estimation. For the luxury peers, EssilorLuxotica, Hermes and Prada were excluded because their average EV/EBITDA multiple are above 30x. The average multiples for EV/Sales are 1.8x (automotive) and 3.0x (apparel & accessories), EV/EBITDA 9.6x (automotive) and 12.3x (apparel & accessories), EV/EBIT 19.8x (automotive) and 17.0x (apparel & accessories). Again, we are applying an average weight of 50% for the automotive and 50% for the apparel and accessories peers, resulting in 2.4x EV/Sales, 11.0x EV/EBITDA and 18.4x EV/EBIT. As for Porsches financial metrics, we calculated with the

respective FY21 numbers. Multiplying the financial metrics with the respective multiples results in an overall EV of EUR 90,102.3m, Equity Value of EUR 84,224.8m and implied share price of EUR 92.5. For further details please refer to *table 1.15* in the *appendix*.

7.5 Valuation Approach #4: Precedent Transactions

This section focuses on relevant precedent transactions. For this approach, selected automotive manufacturers as well as apparel & accessories past transactions were included and the respective EV/Sales, EV/EBITDA and EV/EBIT transaction multiples analyzed. We limited the transaction to an effective date between 2015 to 2021, with a minimum target EV of EUR 100m and a minimum EV/EBIT transaction multiple of 5x and a maximum of 30x, also to be consistent with the CCA. Moreover, we only included transactions of great importance and consistent with automotive OEMs as well as luxury brands. Furthermore, we included the transaction of ZF Friedrichshafen AG acquiring WABCO Holdings Inc. from the automotive supplier sector, which has been of great importance for the entire automotive industry. Equally averaging our 10 selected automotive transactions results in average multiples of 3.7x Sales, 9.2x EBITDA and 13.9x EBIT, whereas the 12 selected apparel & accessories transactions result in 3.0x Sales, 12.6x EBITDA and 15.5x EBIT. Multiplying the respective multiples leaves us with an average EV of EUR 94,013.2m, equity value of EUR 82,114.8m and implied share price of EUR 90.1. The performed analysis can be found at *table 1.16* in the *appendix*

8. Conclusion

During the study, a range of valuation methods were introduced and put into action to evaluate the intrinsic value of Porsche at the time of its IPO. The main objective was to identify whether Porsche was undervalued or overvalued. Alongside the valuation approaches, a comprehensive company analysis and market analysis was conducted, considering macroeconomic indicators such as the expanding luxury market and the ongoing shift towards electric vehicles. This

analysis shaped the groundwork for our subsequent financial analysis of the reformulated financial statements in order to properly form our assumptions for the forecast and the identified value drivers. Moreover, we identified a group of relevant peers based on business and financial criteria that included besides automotive peers also competitors from the luxury market that were used for the conducted valuation. On top of that, key valuation metrics such as the derivation of the WACC is computed by applying traditional financial theories such as the CAPM. This approach required several steps that included the calculation of the cost of equity and cost of debt as well as the approximation of the country risk and market risk premium. Our analysis resulted in a final valuation that estimates Porsche's EV at EUR 92,407.1m, with an implied share price of EUR 90.85 at the IPO conducted on the 29th of September in 2022.

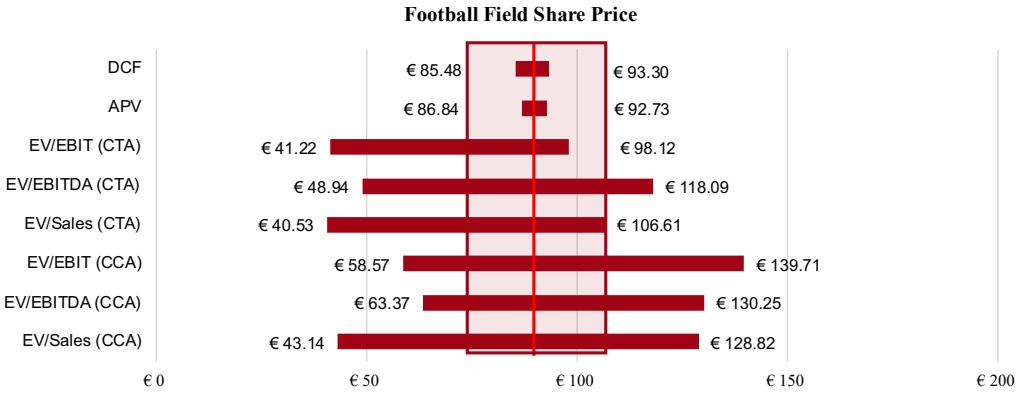


Figure 1.19 Valuation Overview – Share Price (Created by authors)

As described before, Porsche differentiates itself from most of its peers. Hence, as for our resulting valuation range, we have chosen to focus on values between our mean EV/EBIT (CTA) of EUR 72.4, and the mean EV/Sales (CTA) of EUR 109.7, since both are the mean lower and upper bounds of our analysis. Hence, according to our valuation, the IPO was undervalued by a discount of 10.1%, indicating that a higher potential valuation was untapped.

We identified potential risks that might impacted the undervaluation and future outlook on Porsche. Examining these risks is vital in gaining insights into the potential of the IPO and understanding Porsche's strategies for adapting to a dynamic environment to ensure ongoing success. Exchange rate exposures might have both positive or negative effects, since roughly one-third

of its units sold in North America and another third in Asia. Therefore, currency fluctuations may lead to transaction and translation impacts. Moreover, regulatory decisions could either benefit or challenge Porsche, depending on their attitude towards certain technologies or business practices. Advances in zero-emission powertrains or other breakthrough technologies could have threatened Porsche's competitiveness but might also strengthened its market position if it is first to market. With its current BEV line-up, Porsche has a highly competitive product portfolio. Notably, since Porsche utilizes the VW Group's platforms for software and vehicle architecture, any delays in software development could disrupt Porsche's model launch schedules. However, this collaboration also provides Porsche with cost-saving benefits through access to group technology. Lastly, Porsche's business model could be associated with general risks such as rising material costs, wage inflation, and competitive pricing pressures, among others. Overall, the comprehensive valuation of Porsche and the identification of potential risks provide information about the IPO price and the company's future prospects.

1. Introduction

IPOs have been a crucial avenue for companies to raise capital and become publicly traded entities, enabling them to access a wider pool of investors (Loughran and Ritter 2002). Investors can acquire shares of the company at a predetermined price, which is set by the advising investment bank. However, the closing price on the first trading day is often deviating from the set price, which is indicating a mispricing by the investment bank (Krigman, Shaw, and Womack 1999). Investors therefore bear an additional risk when they participate in an IPO. Despite bearing additional risk, the mispricing is on average benefiting investors, as immediate returns are typically achieved, which is commonly known as underpricing (Ritter 1984). The observed phenomenon of underpricing, potentially leaving money on the table for the issuing company has been a subject of significant academic and practical interest.

Ibbotson and Jaffe (1975) laid the foundation for the signaling literature, by finding the significance of underpricing as a mechanism to communicate the quality of a company to investors. However, the undervaluation follows a cyclical pattern that includes phases of both increased and decreased underpricing (Ibbotson and Jaffe 1975). Hence, the level of underpricing differs not only across distinct countries but also within the same country for various IPOs. External market dynamics are potential explanations for these deviations (Ljungqvist 2007). The current literature extensively explores the impact of external drivers on IPO underpricing. However, there remains no consensus regarding external factors, particularly in Germany. Therefore, the study concentrates on Germany and its recent IPOs. It's notable to state that the majority of the analyzed IPOs occurred on the main stock exchange in Frankfurt. This exchange is the largest and most important platform in Germany, which is characterized by its electronic trading system for financial assets, XETRA. It contributes significantly to the majority of the trading volume on the German market (Deutsche Börse Group 2020). This study contributes to existing research by addressing the question: "*What external market determinants affect the consitent underpricing of IPOs, specifically within the German market*?"

The question is answered through a detailed examination based on a multivariate regression model, analyzing 145 IPOs in Germany with a focus on variables like Offered Ownership, Market Conditions, Underwriting Reputation, Market Periods, and the Influence of Recent Crises. The findings of this investigation reveal a notable influence of the Underwriting Reputation variable on IPO underpricing. Significantly, it is observed that the impact of the Underwriting Reputation remains robust, even when adjusting for industry- and year-fixed effects.

The subsequent section includes a literature review on external factors affecting underpricing, presentation of previous research results, and the formulation of primary hypotheses in section two. Section three outlines the methodology, including data collection and sample size. Section four discusses variables and the regression model, followed by descriptive statistics and a summary of empirical results. Finally, the study concludes by presenting implications and acknowledging research limitations in section five.

2. Literature review and hypotheses development

2.1 Literature review

The phenomenon of IPO underpricing refers to the situation in which the initial market price of newly issued shares exceeds their offer price on the first day of trading, resulting in an immediate positive return for investors (Loughran and Ritter 2002). Although early IPO studies, exemplified by studies like Stoll and Curley (1970) and McDonald and Fisher (1972), primarily emphasized the return prospects for shareholders and revealed that initial offerings typically furnish substantial immediate gains, subsequent investigations have aimed to explain the determinants accounting for the magnitude of underpricing. A consensus among several authors posits that the first day excess return remains an unavoidable consequence, essentially stemming from the presence of information asymmetry beneath various stakeholders participating in the IPO procedure (Ritter and Welch 2002).

The literature suggests that underpricing can be attributed to either a deliberate strategy by the issuer to mitigate information asymmetry or an inadvertent yet tolerated outcome of the issuer's interactions with the managing investment bank (Rock, 1986; Welch, 1989). Welch (1989) argues that underpricing serves as a signaling mechanism for high-quality firms that intend to offer only a limited portion of their shares in the IPO and subsequently recoup the unrealized value through subsequent seasoned offerings. Additionally, the issuer deliberately underprices the offering to incentivize initial investors to participate, thereby initiating a positive effect on subsequent investors. A further explanation centers on the presence of information asymmetry among the issuing firm and the underwriter, as outlined by Miller and Reilly (1987). The advising investment bank typically possesses more comprehensive knowledge regarding the expected share demand and the broader capital market dynamics in comparison to the issuing firm, as noted by Baron (1982). Consequently, the issuer provides the underwriter an incentive to determine an offer price lower than the optimum, thereby compelling the underwriter to reveal its confidential information and encouraging the sale of underpriced shares, as expounded by Beatty and Welch (1996). According to Shiller (1990), underpricing is therefore intentionally induced by underwriters to foster the illusion of heightened demand for the issue.

However, some studies link underpricing to market inefficiencies or irrational behaviors instead of solely attributing it to information asymmetry, as posited by Aggarwal and Rivoli (1990). Further Works such as "The Long-Run Performance of Initial Public Offerings" by Ritter (1991) shed more light on external factors, including market conditions, corporate reputation, and economic crises, which impact the underpricing of IPOs. In accordance with this perspective, as illustrated by Ljungqvist (1997), external effects like the macroeconomic climate, affect underpricing positively. This is further supported by Banerjee, Dai and Shrestha (2011), who analyzed variations in underpricing among cross-country IPOs and attributed them to external influences.

According to Ritter (2003), variations in underpricing can be observed in all jurisdictions where a stock market operates. Loughran, Ritter and Rydqvist (2023) compile data on IPO underpricing from diverse academic research papers for a global comparison. Their work underscores the presence and varying extents of underpricing across 54 distinct countries. Aside from macroeconomic conditions, these variations in underpricing can result from marginal disparities in the IPO process across different countries, attributable to distinct regulatory environments and national laws (Ritter 2003). The IPO process in Europe, particularly in Germany, shares similarities with the procedure in the United States. However, Lowry et al. (2017), Carbonare (2021), along with Ritter (2003), underscore notable differences between German and US IPOs. The significant distinction lies in the marketing phase. For example, as outlined by Carbonare (2021), Germany incorporates a pre-marketing phase. The marketing phase is crucial to determine the interest in an IPO. The procedure provides the necessary information to evaluate whether the determined share pricing of the underwriter and issuer is realistic (Lowry et al. 2017). Nevertheless, these national differences cannot adequately explain the partially excessive differences, especially on a global level (Ritter 2003).

The summarizing study by Loughran et al. (2023) shows that the underpricing varies greatly, ranging from 6.2% in Austria to 82.1% in India. In addition, the study documents a 21.8% underpricing for German IPOs during the period spanning 1978 to 2020. However, the extent of underpricing is heavily influenced by the specific timeframe under consideration. Earlier research about IPO Underpricing in Germany, in particular Ljungqvist (1997), indicates an underpricing of 9.2% from 1970 to 1993. In contrast, Wasserfallen and Wittleder (1994) document a level of 17.6% between 1961 and 1987. Hence, it appears that the underpricing in Germany has declined in recent years (Gandolfi et al. 2018). Nevertheless, it is crucial to acknowledge that different studies employ different calculation methodologies for determining these yields, as indicated by Loughran et al. (2023).

As illustrated, the variability in IPO underpricing is subject to the effects of institutional determinants and contemporaneous market dynamics (Ljungqvist 2007). Following this rationale, it is anticipated that external factors will exert an influence on the degree of underpricing. Consequently, it becomes essential to examine firm-specific external elements and their direct impact on underpricing. Multiple empirical studies have tested cited theories, yielding varied and occasionally incongruous results. In summary, while information asymmetry potentially contributes to the phenomenon's explication, this study will illustrate it is not the sole determinant.

2.2 Hypotheses development

To assess the relationship between underpricing and external effects five selected explanatory variables, drawn from existing IPO literature and prior research findings, are presented with an individual test hypothesis for each variable (*table 2.1*). The developed hypotheses and are evaluated, utilizing an Ordinary Least Squares (OLS) regression model.

Offered Ownership (OO): If equity offerings involve a higher ownership percentage, it is likely to result in greater underpricing during the IPO. The amount of offered control and possible influence is positively correlated with underpricing (Filatotchev and Bishop 2002; Hill 2006). *H1: "Higher offering percentages will lead to increased underpricing and, consequently, higher initial returns."*

Volatility (VO3): This is determined by the volatility, specifically the average standard deviation, of the daily returns of the DAX index during the 30 days preceding the listing day. Elevated index volatility suggests heightened uncertainty, signifying a pessimistic outlook on IPOs (Ljungqvist 2007; Lowry, Officer and Schwert 2010). *H2: "There is an inverse relationship between favorable market conditions and the initial return."*

Advisor Reputation (ADV): A binary variable with a value of 1 is assigned to distinguished underwriters and 0 for those with less distinguished reputations. It is presumed that esteemed underwriters exhibit reduced risk profiles, thus exerting a downward influence on underpricing

(Carter and Manaster 1990; Carter, Dark and Singh 1998). *H3:" IPOs handled by prestigious advisors and underwriters are anticipated to have reduced risk profiles, and as a result, they are expected to yield lower initial returns."*

Market Period (HOT): Classifying periods as either "hot" or "cold" is determined by the volume of IPOs on a quarterly basis. Specifically, a quarter is denoted "hot" if the number of IPOs surpasses four. Consequently, a binary dummy variable is created, taking on a value of 1 within a hot market period. Conversely, it receives a value of 0 during cold market periods (Ritter 1984, Derrien 2005, Ljungqvist 2007). *H4:" IPOs listed during hot market periods will exhibit higher initial returns compared to IPOs listed during cold market periods."*

After Crisis (AC): Employing a binary variable with a value of 1 for IPOs listed post-March 2020, and 0 for those in the earlier timeframe. This variable is introduced to address potential sample bias stemming from the global pandemic crisis and the subsequent Ukraine conflict, which were associated with a significant stock market downturn (Mazumder and Saha. 2021). *H5: "The ongoing economic recession is likely to result in a reduction in underpricing."*

3. Data and methodology

3.1 Sample and data sources

The regression analysis was performed on a dataset comprising companies that underwent IPOs in Germany between the period of January 1, 2010, and December 31, 2022. This dataset was sourced from the Bloomberg database and was specifically limited to Equity IPOs, thereby excluding secondary offerings and other initial offerings. The original dataset encompassed a total of 186 observations pertaining to IPOs on the German market, according to Bloomberg records. To mitigate the potential influence of statistical outliers, a winsorization procedure was applied at a 10% level. Consequently, the resultant dataset under consideration for the analysis was refined to consist of 145 IPOs. In adherence to the requirements of valid regression analyses, it is imperative to ensure conformity with the six fundamental assumptions delineated in

table 2.2 appended herewith (Gujarati 2022). The outcomes of these diagnostic tests, which are expounded upon in *table 2.3* through *table 2.5* within the appendix, affirm the validity of most assumptions, with the exception of homoskedasticity being disproven. This issue is addressed by employing robust standard errors, a technique designed to derive unbiased standard errors for OLS coefficients in the presence of heteroscedasticity. Additionally, for a thorough comprehension of the analyzing data, summary statistics of the variables are presented in *table 2.6* through *table 2.9*, as included in the appendix. All tables encompassing essential statistics such as mean, median, standard deviation, minimum, and maximum values.

3.2 Methodology

3.2.1 Dependent Variable

The first trading day's performance is assessed utilizing the conventional approach of quantifying the raw initial return (RIR) using the following equation:

$$RIR_{i,t} = \frac{P_{i,1-} P_{i,0}}{P_{i,0}} \tag{2.1}$$

$RIR_{i,t}$ represents the raw initial return on an IPO's first day of listing for company i, with $P_{i,0}$ representing the initial offer price and $P_{i,1}$ indicating the closing price on that day. The choice of the closing price as a performance metric is due to its reflection of market equilibrium, influenced by supply and demand forces. Equation (2.1) is appropriate for scenarios where ideal market conditions prevail, characterized by the absence of opportunity costs. Nevertheless, it is crucial to acknowledge that the time gap between the close of the subscription period and the start of trading may witness significant information disclosures and market dynamics. Consequently, to accommodate these market fluctuations, an adjustment to the raw initial return is necessary. This adjustment involves considering the movements of the DAX Index, which is the appropriate benchmark for the overall market performance. The calculation of the market adjusted initial return ($MAIR$) can be expressed as indicated in Equation 2.2:

$$MAIR_{i,t} = \left[\frac{P_{i,1-}\ P_{i,0}}{P_{i,0}} - \frac{D_{i,1-}\ D_{i,0}}{D_{i,0}}\right] \quad (2.2)$$

$MAIR_{i,t}$ represents the market adjusted initial return observed on the IPO's first listing day for company *i*. $D_{i,0}$ signifies the DAX during the closing of the shares' subscription period for company i, while $D_{i,1}$ is the DAX at the close of the initial trading day. To have a more precise result, this study focuses on $MAIR$ as the dependent variable.

3.2.2 Explanatory Variables

Consistent with prevailing literature in the extensive realm of IPO research, we have incorporated two control variables: the deal size (lnDS) of the offering and the market capitalization at the time of the IPO (lnMC). These have been included alongside the five primary explanatory variables previously outlined in our initial hypothesis's development. Therefore, this study utilizes a multivariate regression model to analyze the collective influence of the explanatory variables, as illustrated in Equation 2.3:

$$MAIR_i = \beta_0 + \beta_1 OO + \beta_2 VO3 + \beta_3 ADV + \beta_4 HOT + \beta_5 AC + \beta_6 lnDS + \beta_7 lnMC + \varepsilon_i \quad (2.3)$$

A summary of the hypotheses incorporated and described in the model, as well as the abbreviations of all variables, can be found in *table 2.1* and *table 2.6* in the appendix.

4. Empirical results and discussion

The execution of the multivariate regression model has resulted in the outcomes showcased in *table 2.10.* In every model, statistical significance is consistently observed at both the 1% and the 5% level, as also indicated in *table 2.10* in the appendix. Notably, the fixed effects are estimated to address group-level heterogeneity, with the constant being included within the individual effects of each variable. The average degree of underpricing within the sample is at 3.00%. Especially the energy industry exhibits the lowest mean underpricing, amounting to -0.60% and is therefore the only sector in Germany, which is not underpriced and thus

overvalued on average. On the other hand, the basic materials, technology, and industrial sectors show a heightened underpricing of 6.78%, 6.24%, and 5.51%, respectively (*table 2.9*).

Variable	OLS	Robust	Industry + Year
Offered Ownership	-0.029	-0.030	-0.052
	(0.701)	(0.719)	(0.167)
Average Volatility (30 Days)	-0.003*	-0.004	0.001
	(0.085)	(0.261)	(0.158)
Advisor	-0.128***	-0.127***	-0.112***
	(0.001)	(0.001)	(0.000)
Hot Period	-0.035	-0.032	-0.011*
	(0.178)	(0.195)	(0.097)
After Crisis	-0.018	-0.018	n.a
	(0.513)	(0.411)	
ln Deals Size	-0.003	-0.003	0.008
	(0.902)	(0.908)	(0.514)
ln Market Cap at Offering	0.004	0.004	-0.006
	(0.850)	(0.841)	(0.680)
Constant	0.243*	0.243	n.a.
	(0.093)	(0.162)	
No. of observations	145	145	121
R^2	0.268	0.268	0.356
p - Value	0.001***	0.001***	0.009**
Robust standard erros	No	Yes	Yes
Fixed effects	No	No	Yes

Note: *p< 0.1; **p< 0.05; ***p<0.01

Table 2.11: Regression results (created by author)

An analysis of the regression results pertaining to the variable Offered Ownership indicates that the anticipated positive impact on underpricing is not substantiated. None of the models reveal a statistically significant influence. Observing the second variable Volatility leads to the conclusion that the anticipated negative impact on underpricing can be confirmed. However, it's essential to highlight that the statistically significant evidence supporting this hypothesis is only observable at the 10% level within the OLS-Model but has very low p-values throughout all other models (*table 2.10*). As a result, this doesn't completely validate findings from previous research, as exemplified in the work of Ljungqvist (2007). Upon examining the advisor reputation variable, as hypothesized, a significant negative effect on underpricing is consistently observed in each model, with a 1% level of significance. Consequently, this study confirms evidence from prior research examining the impact of the underwriting reputation such as Shiller (1990). Furthermore, the outcomes for the Hot Period hypothesis demonstrate a statistically significant impact at the 5% level when incorporating industry fixed effects (*table 2.10*). A

pattern that persists in the industry and year fixed effects model, but only at 10%. This implies that the hypothesis, drawn from the studies of Ritter (1984) or Derrien (2005) cannot be entirely validated due to inconsistencies across all models. A similar observation applies to the last variable. The variable After Crisis is only statistically significant in the industry model at the 1% level. However, it's essential to note that when considering year-fixed effects, the variable is logically eliminated through the model. Ultimately, the control variables deal size and market capitalization at offering display a positive effect (DS) and a negative effect (MC) on underpricing, while none is significant in any model.

5. Conclusions

The phenomenon of underpricing has repeatedly been the subject of extensive scholarly inquiry throughout the decades. The present study contributes to the extant body of knowledge on IPOs by conducting an empirical investigation into a dataset comprising recent IPOs on the German market during 2010 till 2022. This research provides empirical insights for the hypothesis that underpricing is diminishing because of the involvement of prestigious underwriters. This, in turn, corroborates the conjecture that the underpricing of IPOs is adversely impacted by the diminished risk profile associated with reputable underwriters, thereby resulting in reduced initial returns. To synthesize, the outcomes of this investigation yield significant implications, which, however, require further examination to be substantiated. To this end, future research efforts should include a broader spectrum of factors and require the expansion of datasets. Moreover, the exploration of additional company-specific external factors is necessary for a more comprehensive evaluation. Furthermore, the scope of investigation should extend beyond the German borders examined to facilitate the formulation of coherent and robust assertions.

References

Accenture Plc. 2021. Retrieved from https://www.accenture.com/us-en/insights/automotive/busting-automotive-sustainability-myths

Aggarwal, Reena, and Pietra Rivoli. 1990. "Fads in the initial public offering market?" Financial management 19: 45-57. https://doi.org/10.2307/3665609

Aggarwal, Reena, Prabhala, Nagpurnanand R., and Manju Puri. 2002. Institutional Allocation in Initial Public Offerings: Empirical Evidence: The Journal of Finance 57(3): 1421-1442. doi:10.1111/1540-6261.00465

Allen, Franklin and Faulhaber, Gerald R. 1989. Signaling by underpricing in the IPO market. Journal of Financial Economics 23(2): 303-323. https://doi.org/10.1016/0304-405X(89)90060-3

Andropoulos, Chris. 2020. Porsche / VW Group Platforms. A look at the underpinnings Porsche shares with its sister brands. Retrieved from https://www.excellence-mag.com/issues/272/articles/porsche-vw-group-platforms

Ang, James S. and Brau, James C. 2002. Firm Transparency and the Costs of Going Public. Journal of Financial Research, 25 (1): 1–17.

Babel, Bernhard, Gius, Daniela, Gräwert, Alexander, Lüders, Erik, Natale, Alfonso, Nilsson, Björn and Schneider, Sebastian. 2012. Capital Management. Bankings new imperative. McKinsey Working Paper, 38.

BaFin. 2022. Dr. Ing. h.c. F. Porsche Aktiengesellschaft. Prospectus for the public offering. Retrieved from https://portal.mvp.bafin.de/database/VPInfo/DownloadController.do

Banerjee, Suman, Lili Dai, and Keshab Shrestha. 2011. "Cross-country IPOs: what explains differences in underpricing?." Journal of Corporate Finance 17(5): 1289-1305. https://doi.org/10.1016/j.jcorpfin.2011.06.004

Baron, David P. 1982. "A model of the demand for investment banking advising and

distribution services for new issues." The journal of finance 37(4): 955-976. https://doi.org/10.1111/j.1540-6261.1982.tb03591.x

Beatty, Randolph. P. and Ritter, Jay R. 1986. Investment banking, reputation, and the underpricing of initial public offerings. Journal of Financial Economics, 15(1-2): 213-232. https://doi.org/10.1016/0304-405X(86)90055-3

Benveniste, Lawrence M., and Spindt, Paul A. 1989. "How investment bankers determine the offer price and allocation of new issues." Journal of financial Economics 24(2): 343-361. https://doi.org/10.1016/0304-405X(89)90051-2

Benveniste, Lawrence M., Busaba, Walid Y. 1997. Bookbuilding vs. Fixed Price: An Analysis of Competing Strategies for Marketing IPOs. The Journal of Financial and Quantitative Analysis, 32 (4): 383–403.

Berk, Jonathan and DeMarzo, Peter. 2019. Corporate Finance. 5th Edition. Harlow: Pearson Education.

Blowers, Stephen C., Griffith, Peter H. and Milan, Thomas L. 1999. The Ernst & Young Guide to the IPO Value Journey. New York City: John Wiley & Sons, Inc.

Boston, William. 2022. Volkswagen to List Porsche in One of Biggest IPOs in Years. Retrieved from https://www.wsj.com/articles/volkswagen-to-list-porsche-in-one-of-biggest-ipos-in-years-11662413312

Brand Finance. 2022. Porsche is most valuable luxury brand. Retrieved from https://brandfinance.com/press-releases/porsche-is-most-valuable-luxury-brand

Brau, James. C. and Fawcett, Stanley E. 2006. Evidence on What CFOs Think About the IPO Process: Practice, Theory, and Managerial Implications. Journal of Applied Corporate Finance, 18 (3): 107–117.

Brealey, Richard A., Myers, Stewart C. and Allen, Franklin. 2020. Principles of Corporate Finance. 13th Edition. New York: McGraw-Hill Education.

Campbell, Peter and Miller, Joe. 2022. Porsche IPO: the race to catch Ferrari. German sports

car brand seeks luxury valuation in long-awaited float. Retrieved from https://www.ft.com/content/dfbfea32-976f-475e-bc5a-29325fa65ce6

Car and Drivers. 2022. Car and Drivers Magazine. Retrieved from Car and Driver: New Car Reviews, Buying Advice and News

Carbonare, Marco G. 2021. „The Initial Public Offerings Law Review: Germany" In The Initial Public Offerings Law Review - Fifth Edition, edited by Marco Georg Carbonare, 69-78. London: Law Business Research

Carls, Andre. 2013. Das Going-public-Geschäft deutscher Banken: Markt- und risikopolitische Implikationen. Wiesbaden: Deutscher Universitäts Verlag.

Carter, Richard, and Manaster, Steven. 1990. “Initial public offerings and underwriter reputation.” The Journal of Finance, 45(4), 1045-1067. https://doi.org/10.1111/j.1540-6261.1990.tb02426.x

Carter, Richard B., Dark, Frederick H. and Singh, Ajai K. 1998. „Underwriter reputation, initial returns, and the long-run performance of IPO stocks.” The journal of finance, 53(1), 285-311. https://doi.org/10.1111/0022-1082.104624

Chasanah, Nailul and Sucipto, Agus. 2019. Liquidity Ratio, Profitability, And Solvency On Stock Returns With Capital Structure As An Intervening Variable. Journal Bisnis dan Manajemen, 1 (3): 52-68.

Corwin, Shane. A., and Schultz, Paul. 2005. The Role of IPO Underwriting Syndicates: Pricing, Information Production, and Underwriter Competition. The Journal of Finance, 60(1): 443-486. doi:10.1111j.1540-6261.2005.00735.x

Damodaran, Aswath. 2012. Investment Valuation: Tools and Techniques for Determining the Value of Any Asset. New Jersey: John Wiley & Sons.

Damodaran, Aswath. 2022. Country Default Spreads and Risk Premiums. Retrieved from: https://www.stern.nyu.edu/~adamodar/pc/datasets/ctrypremJuly22.xlsx

Derrien, François. 2005. "IPO pricing in “hot” market conditions: Who leaves money on the

table?" The journal of finance 60(1): 487-521. https://doi.org/10.1111/j.1540-6261.2005.00736.x

Deutsche Börse AG. 2006. Praxishandbuch Börsengang: von der Vorbereitung bis zur Umsetzung. Wiesbaden: Springer Gabler Verlag.

Deutsche Börse Group. 2020. Xetra – der elektronische Handelsplatz der Deutschen Börse. Retrieved from https://deutsche-boerse.com/dbg-de/produkte-services/insights-200-jahre-wp/Xetra-der-elektronische-Handelsplatz-der-Deutschen-B-rse--2273688

Ferran, Ellis and Ho, Look Chan. 2014. Principles of Corporate Finance and Law. 2nd Edition. New York: Oxford University Press.

Filatotchev, Igor, and Bishop, Kate. 2002. "Board composition, share ownership, and 'underpricing' of UK IPO firms." Strategic management journal 23(10): 941-955. https://doi.org/10.1002/smj.269

Gandolfi, Gino, Massimo Regalli, Maria-Gaia Soana, and Maria Cristina Arcuri. 2018. "UNDERPRICING AND LONG-TERM PERFORMANCE OF IPOS: EVIDENCE FROM EUROPEAN INTERMEDIARY-ORIENTED MARKETS." Economics, Management & Financial Markets 13(3): 11-36.

Grah, Annika. 2019. Als Porsche einst Volkswagen übernehmen wollte. Retrieved from https://www.dw.com/de/als-porsche-einst-volkswagen-%C3%BCbernehmen-wollte/a-49618351

Guan, Mingyu, Köstring, Jan-Christoph, Middleton, Simon and Möller, Timo. 2022. Five trends shaping tomorrow's luxury-car market. Luxury-car sales continue to surpass the mass market in terms of growth, profitability, and buzz. Here's why. Retrieved from https://www.mckinsey.com/~/media/mckinsey/industries/automotive%20and%20assembly/our%20insights/five%20trends%20shaping%20tomorrows%20luxury%20car%20market/five-trends-shaping-tomorrows-luxury-car-market.pdf?shouldIndex=false

Gujarati, Damodar N. 2022. Basic econometrics. Prentice Hall, 2022. http://portal.belesparadisecollege.edu.et:8080/library/bit-stream/123456789/2098/1/Basic%20Economics-The%20McGraw-Hill%20Series.pdf

Hill, Paula. 2006. "Ownership structure and IPO underpricing." Journal of Business Finance & Accounting 33(1-2): 102-126. https://doi.org/10.1111/j.1468-5957.2006.01359.x

Hillier, David, Clacher, Ian, Ross, Stephen, Westerfield, Randolph and Jordan, Bradford. 2014. Fundamentals of Corporate Finance. 2nd Edition Berkshire. United Kingdom: McGraw-Hill Education.

Howarth, Josh. 2022. 10 Important Auto Industry Trends (2023-2025). Retrieved from https://explodingtopics.com/blog/auto-industry-trends

Ibbotson, Roger G., and Jeffrey F. Jaffe. 1975. "“Hot issue” markets." The journal of finance 30(4): 1027-1042. https://doi.org/10.1111/j.1540-6261.1975.tb01019.x

Jakob, Elmar. 1998. Initial Public Offerings: aktuelle Entwicklungen des Aktienemissionsgeschäfts. Wiesbaden: Deutscher Universitäts Verlag.

Jegadeesh, Narasimhan, Weinstein, Mark and Welch, Ivo. 1993. An empirical investigation of IPO returns and subsequent equity offerings. Journal of Financial Economics, 34 (2): 153–175.

Jenkinson, Tim and Ljungqvist, Alexander. 2001. Going Public: The Theory and Evidence on How Companies Raise Equity Finance. 2nd Edition. New York City: Oxford University Press.

Jiang, Bin and Koller, Timothy. 2006. A long-term look at ROIC. Retrieved from https://www.mckinsey.com/capabilities/strategy-and-corporate-finance/our-insights/a-long-term-look-at-roic

Katti, Supriya and Phani B. 2016. Underpricing of Initial Public Offerings: A Literature Re view. Universal Journal of Accounting and Finance, 4 (2): 35–52.

Keloharju, Matti. 1993. The winner's curse, legal liability, and the long-run price performance

of initial public offerings in Finland. Journal of Financial Economics 34(2): 251-277. https://doi.org/10.1016/0304-405X(93)90020-C

Kesten, Jay. 2018. The Law and Economics of the Going-Public Decision. The Oxford hand book of IPOs. New York: Oxford University Press.

Kirchhoff, Klaus Rainer and Piwinger, Manfred. 2005. Praxishandbuch Investor Relations. Das Standardhandwerk der Finanzkomunikation. Wiesbaden: Springer Gabler Verlag.

Knight, Frank. 2023. The Wealth Report. Retrieved from https://www.knightfrank.com/siteassets/subscribe/the-wealth-report-2022.pdf

Koller, Tim, Goedhart, Marc and Wessels, David. 2020. Valuation: Measuring and Managing the Value of Companies. 7th Edition. Hoboken: John Wiley & Sons.

Köhler, Peter. 2022. Porsche-IPO bringt Volkswagen mehr als neun Milliarden Euro. Retrieved from https://www.handelsblatt.com/finanzen/maerkte/aktien/neuemission-porsche-ipo-bringt-volkswagen-mehr-als-neun-milliarden-euro/28735258.html

Krigman, Laurie, Wayne H. Shaw, and Kent L. Womack. 1999. "The persistence of IPO mis-Pricing and the predictive power of flipping." The Journal of Finance 54(3): 1015-1044. https://doi.org/10.1111/0022-1082.00135

Lenglet, Romain. 2022. Everything you need to know about gearing (net debt ratio): define tion, calculation, example. Retrieved from https://agicap.com/en/article/gearing-ratio-net-debt-ratio/

Levis, Mario. 1990. The Winner's Curse Problem, Interest Costs and the Underpricing of Initial Public Offerings. The Economic Journal 100(399): 76-89. https://doi.org/10.2307/2233595

Ljungqvist, Alexander P. 1997. "Pricing initial public offerings: Further evidence from Germany." European Economic Review 41(7): 1309-1320. https://doi.org/10.1016/S0014-2921(96)00035-9

Ljungqvist, Alexander. 2007. "IPO underpricing." Handbook of empirical corporate finance

375-422. https://doi.org/10.1016/B978-0-444-53265-7.50021-4

Logue, Dennis E. 1973. On the Pricing of Unseasoned Equity Issues: 1965-1969. The Journal of Financial and Quantitative Analysis 8(1): 91–103. https://doi.org/10.2307/2329751

Loughran, Tim, and Ritter, Jay R. 2000. Why Don't Issuers Get Upset About Leaving Money on the Table in IPOs? Available at SSRN, 15 (2): 413–444.

Loughran, Tim, Ritter, Jay and Rydqvist, Kristian. 2023. Initial public offerings: International insights: Updated version. Pacific-Basin Finance Journal, 2(2-3): 165-199. https://site.warrington.ufl.edu/ritter/files/IPOs-International.pdf

Lugauer, Peter. 2023. Porsche AG: Starke Marke und Positionierung sind die Wachstumsbasis. Retrieved from https://www.ideas-magazin.de/2023/ausgabe-249/maerkte/porsche-ag-starke-marke-und-positionierung-sind-die-wachstumsbasis/

Lowry, Michelle, Officer, Micah S. and Schwert, William G. 2010. "The variability of IPO initial returns." The Journal of Finance 65(2): 425-465. https://doi.org/10.1111/j.1540-6261.2009.01540.x

Lowry, Michelle, Roni Michaely, and Ekaterina Volkova. 2017. "Initial public offerings: A synthesis of the literature and directions for future research." Foundations and Trends® in Finance 11(3-4): 154-320. http://dx.doi.org/10.1561/0500000050

Mazumder, Sharif and Saha, Pritam. 2021. "COVID-19: Fear of pandemic and short-term IPO performance." Finance research letters 43: 101977. https://doi.org/10.1016/j.frl.2021.101977

Miller, Robert E., and Frank K. Reilly. 1987. "An examination of mispricing, returns, and uncertainty for initial public offerings." Financial Management: 33-38. https://doi.org/10.2307/3666001

Miller, Robert E., and Frank K. Reilly. 1987. "An examination of mispricing, returns, and uncertainty for initial public offerings." Financial Management: 33-38. https://doi.org/10.2307/3666001

Misoyannis, Alex. 2023. Porsche 718 Cayman GT4, Spyder discontinued. Retrieved from https://www.drive.com.au/news/porsche-718-cayman-gt4-spyder-discontinued/

Neiger, Chris. 2022. 5 Things to Know About the Porsche IPO. Retrieved from https://www.nasdaq.com/articles/5-things-to-know-about-the-porsche-ipo

Pagano, Marco, Panetta, Fabio and Zingales, Luigi. 1998: Why do companies go public? An empirical analysis. The Journal of Finance, 53 (1). 27–64.

Penman, Stephen. 2013. Financial Statement Analysis and Security Valuation. 5th Edition. New York: McGraw-Hill Irwin.

Petersen, Christian Vriborg, Plenborg, Thomas and Kinserdal, Finn. 2017. Financial Statement Analysis: Valuation - Credit Analysis - Performance Evaluation. Bergen: Fagbokforla-get.

Porsche AG. 2022a. Porsche Historical Background: 1948-2023. Retrieved from https://press.porsche.com/prod/presse_pag/PressResources.nsf/jumppage/unterneh-men-pcna-history?OpenDocument

Porsche AG. 2022b. Porsche enters a new era with successful IPO. Retrieved from https://newsroom.porsche.com/en/2022/company/porsche-ag-initial-public-offering-p911-frankfurt-stock-exchange-29830.html

Porsche AG. 2022c. Porsche Strategy 2030. Retrieved from https://newsroom.porsche.com/en/company/annual-sustainability-report-2021/porsche-strategy-2030.html

Porsche AG. 2022d. Sustainability: the path to becoming a “zero impact factory”. Retrieved from https://newsroom.porsche.com/en/company/leipzig/sustainability.html

Porsche AG. 2022e. Wertpapierprospekt für Börsengang der Porsche AG veröffentlicht. Re-trieved from https://newsroom.porsche.com/de/2022/unternehmen/porsche-ag-bo-ersengang-veroeffentlichung-wertpapierprospekt-angebotsfrist-29739.html

Porsche AG. 2022f. The origin: why Porsche announced an SUV in 1998. Retrieved from

https://newsroom.porsche.com/en/2022/products/porsche-cayenne-anniversary-20-years-success-story-origin-28744.html

Porsche AG. 2022g. E-Performance Strategy. Three new Panamera models extend the plug-in hybrid portfolio. Retrieved from https://media.porsche.com/mediakit/panamera-hybrid-track-days/en/the-panamera-hybrid-models/summary

Porsche AG. 2022i. Porsche aims for growth in the luxury segment. Retrieved from https://newsroom.porsche.com/en/2022/company/porsche-capital-markets-day-29030.html

Porsche AG. 2021a. Annual Report 2021. Retrieved from https://newsroom.porsche.com/de/unternehmen/porsche-geschaefts-und-nachhaltigkeitsbericht-2021/download-center.html

Porsche AG. 2021b. Green light for the joint company Bugatti Rimac. Retrieved from https://newsroom.porsche.com/en/2021/company/porsche-bugatti-rimac-joint-venture-26260.html

Porsche AG. (2021c). Porsche invests in a factory for high-performance battery cells. Retrieved from https://newsroom.porsche.com/en/2021/company/porsche-investment-factory-high-performance-battery-cells-cellforce-group-gmbh-joint-venture-partner-customcells-24855.html

Porsche AG. 2020. Annual Report 2020. Retrieved from https://newsroom.porsche.com/de/unternehmen/porsche-geschaefts-und-nachhaltigkeitsbericht-2021/download-center.html

Porsche AG. 2018. Seit 70 Jahren steht Porsche für Sportwagen. Retrieved from https://newsroom.porsche.com/de/unternehmen/porsche-70-jahre-sportwagen-neujahrsempfang-jubilaeum-356-nr-1-roadster-ferry-porsche-ferdinand-alexander-porsche-tradition-zukunft-mission-e-oliver-blume-14749.html

Porsche SE. 2022. Porsche SE. Unternehmen – Über uns. Retrieved from

https://www.porsche-se.com/unternehmen/ueber-uns

Porsche SE. 2021. Annual Report 2021. Retrieved from https://www.porsche-se.com/fileadmin/downloads/investorrelations/mandatorypublications/annualreport-21/PSE2021_Annual_Report_en.pdf

Reuters. 2023. Volkswagen invests in batteries, raw materials in race for affordable EV. Retrieved from https://www.reuters.com/business/autos-transportation/volkswagen-invest-180-bln-euros-five-year-plan-2023-03-14/

Ritter, Jay R. 1984. "The" hot issue" market of 1980." Journal of business, 215-240. https://www.jstor.org/stable/2352736

Ritter, Jay R. 1991. "The long-run performance of initial public offerings." The journal of finance 46(1): 3-27. https://doi.org/10.1111/j.1540-6261.1991.tb03743.x

Ritter, Jay R. and Welch, Ivo. 2002. A Review of IPO Activity, Pricing, and Allocations. The Journal of Finance, 57(4): 1795–1828. https://doi.org/10.1111/1540-6261.00478

Ritter, Jay R. 2003. "Differences between European and American IPO markets." European financial management 9(4): 421-434. https://doi.org/10.1111/1468-036X.00230

Ritter, Jay R. 2022. Money Left on the Table in IPOs by Firm. Updated Statistics. Retrieved from https://site.warrington.ufl.edu/ritter/files/money-left-on-the-table.pdf

Rock, Kevin. 1986. "Why new issues are underpriced." Journal of financial economics 15(1-2): 187-212. https://doi.org/10.1016/0304-405X(86)90054-1

Rosenbaum, Joshua, Pearl, Joshua. 2009. Investment Banking. Valuation, Leveraged Buyout, and Mergers & Acquisitions. New Jersey: John Wiley & Sons, Inc.

Ruud, Judith S. 1990. Underpricing of initial public offerings: Goodwill, price shaving or price support. Harvard University

Schallenberger, Luca and Ginsburg, Leo. 2022. Vom Audi-Trainee zum VW-Chef: So wurde

Oliver Blume einer der mächtigsten Auto-Bosse der Welt. Retrieved from https://www.businessinsider.de/wirtschaft/mobility/neuer-vw-chef-so-wurde-oliver-blume-zum-maechtigen-auto-boss-d/

Shiller, Robert J. 1990. "Speculative prices and popular models." Journal of Economic perspectives 4(2): 55-65. http://dx.doi.org/10.1257/jep.4.2.55

Schmitd, Hartmut. 1998. Wertpapierbörsen. München: Vahlen Verlag

Schrieber, Hauke. 2022. Neue Plattform für Porsche E-Macan und Co. Retrieved from https://www.autobild.de/artikel/porsche-ppe-plattform-elektro-e-macan-taycan-718-ssp-lucid-22294959.html

Schwuchow, Oliver. 2022. SSP Sport: Porsche entwickelt neue VW-Elektro-Plattform. Retrieved from https://www.mobiflip.de/shortnews/ssp-sport-porsche-neue-vw-elektro-plattform/

Stoughton, Neal M., Wong, Kit. Pong., and Zechner, Josef. 2001. IPOs and Product Quality. The Journal of Business, 74(3): 375-408. doi:10.1016/S0378-4266(97)00014-9

Volkswagen AG. 2022. Platforms. Retrieved from https://www.vw-platform-business.com/en/platforms.html#

Volkswagen Group. 2022a. Porsche Company Presentation. Retrieved from https://www.volkswagen-group.com/de/publikationen/praesentationen/porsche-company-praesentation-englisch-1850

Volkswagen Group. 2022b. Ad-hoc announcement. Retrieved from https://www.volkswagen-group.com/de/ad-hoc/volkswagen-ag-befindet-sich-in-fortgeschrittenen-gespraechen-mit-der-porsche-automobil-holding-se-ueber-einen-moeglichen-boersengang-der-dr-ing-hc-f-porsche-ag-15967

Volkswagen Group. 2022c. Ad-hoc announcement. Retrieved from https://www.volkswagen-group.com/de/ad-hoc/volkswagen-ag-beschliesst-pruefung-eines-moeglichen-boersengangs-der-dr-ing-hc-f-porsche-ag-15970

Volkswagen Group. 2022d. Ad-hoc announcement. Retrieved from https://www.volkswagen-group.com/de/ad-hoc/ausscheiden-des-vorstandsvorsitzenden-aus-dem-vorstand-der-volkswagen-ag-15975

Volkswagen Group. 2022e. Ad-hoc announcement. Retrieved from https://www.volkswagen-group.com/de/ad-hoc/vorstand-und-aufsichtsrat-streben-boersengang-der-dr-ing-hc-f-porsche-ag-an-und-beschliessen-mit-der-intention-to-float-den-naechsten-schritt-15978

Volkswagen Group. 2022f. Ad-hoc announcement. Retrieved from https://www.volkswagen-group.com/de/ad-hoc/vorstand-und-aufsichtsrat-legen-preisspanne-und-angebotsstruktur-fuer-boersengang-der-dr-ing-hc-f-porsche-ag-fest-volkswagen-ag-schliesst-aktienkaufvertrag-mit-der-porsche-automobil-holding-se-ab-15979

Volkswagen AG. 2021. Annual Report 2021. Retrieved from https://annualreport2021.volkswagenag.com/_assets/downloads/entire-vw-ar21.pdf

Volkswagen Group. 2021. NEW AUTO: Volkswagen Konzern erschließt neue Werttreiber für emissionsfreie und autonome Zukunft der Mobilität. Retrieved from https://www.volkswagen-newsroom.com/de/pressemitteilungen/new-auto-volkswagen-konzern-erschliesst-neue-werttreiber-fuer-emissionsfreie-und-autonome-zukunft-der-mobilitaet-7313

Ward, Sandy. 2022. Will Porsche IPO Be as Popular as Its Sports Cars? Retrieved from https://www.morningstar.co.uk/uk/news/226487/will-porsche-ipo-be-as-popular-as-its-sports-cars.aspx

Wahrenburg, Mark. 2001. Emissionsgeschäft. In Gerke, Wolfgang, and Steiner, Manfred (Hrsg.): Handwörterbuch des Bank- und Finanzwesens. Stuttgart: Schäffer-Poeschel.

Wasserfallen, Walter, and Christian Wittleder. 1994. "Pricing initial public offerings: Evidence

from Germany." European Economic Review 38.7 (1994): 1505-1517. https://doi.org/10.1016/0014-2921(94)90023-X

Weinberger, Andreas. 1995. Going Publics in Deutschland - Underpricing, Fair Valuing oder Overpricing? Aachen: Shaker Verlag

Welch, Ivo. 1989. "Seasoned offerings, imitation costs, and the underpricing of initial public offerings." The Journal of Finance 44(2): 421-449. https://doi.org/10.1111/j.1540-6261.1989.tb05064.x

Wolf-Doettinchem, Lorenz. 2021. Das sind die besten Arbeitgeber Deutschlands Retrieved from https://www.stern.de/wirtschaft/arbeitgeber-ranking-von-stern-und-statista--das-sind-die-besten-arbeitgeber-30005738.html

Zhang, Junyi, Schnurrer, Simon, Fang, Frank and Gavin, Liu. 2022. Luxury vehicle market to see rapid growth. Global luxury vehicle market outlook. Retrieved from https://www.oliverwyman.com/content/dam/oliver-wyman/v2/publications/2023/feb/luxury-vehicle-market-to-see-rapid-growth.pdf

Zoeller, Stephen. 2023. How to Segment Your. Retrieved from https://www.stephenzoeller.com/targetmarket-segment-porsche/

Appendix

Figure 1.2 Reasons for undertaking an initial public offering (Brau and Fawcett 2006)

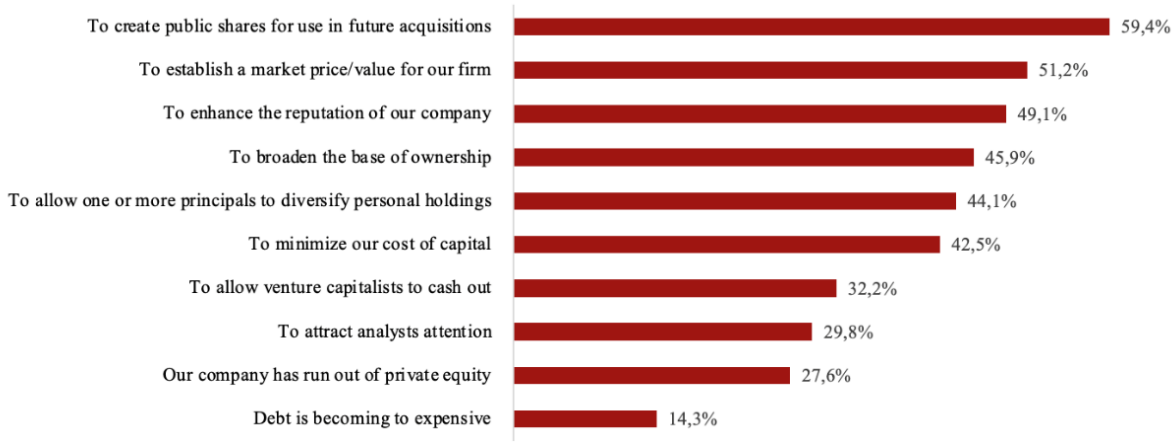


Figure 1.3 Pre IPO-Organizational Structure (Created by authors based on the information's retrieved from the respective annual reports)

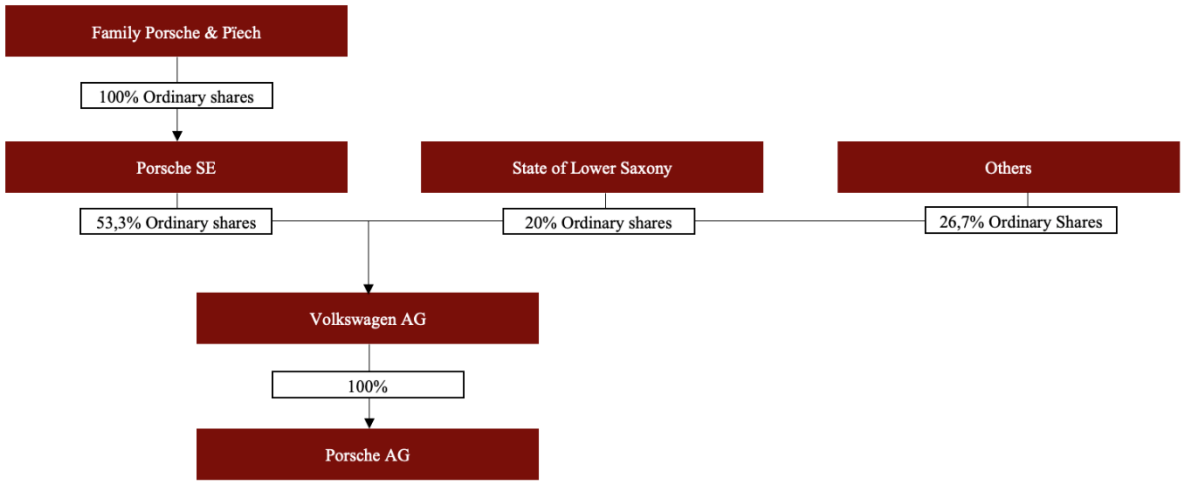


Figure 1.4 Platform Overview across Volkswagen Group (Created by authors; Andropoulos 2020)

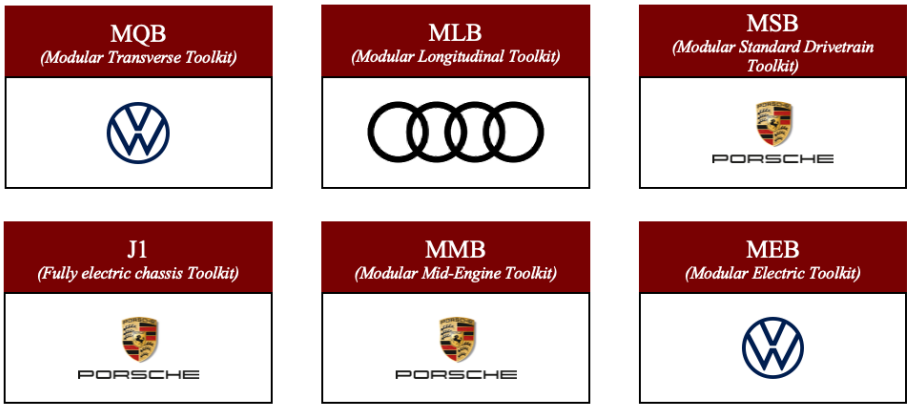


Figure 1.5 EV targets of selected automotive peers (Created by authors based on the information's retrieved from the respective annual reports)

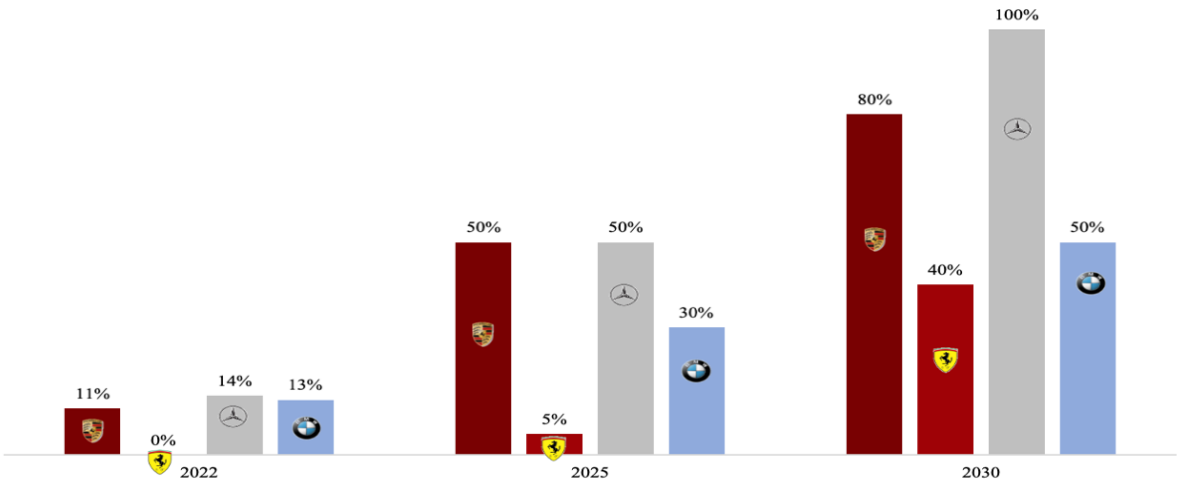


Figure 1.6 Luxury car market segmentation by vehicle cost range and its respective CAGR (Guan et al. 2022)

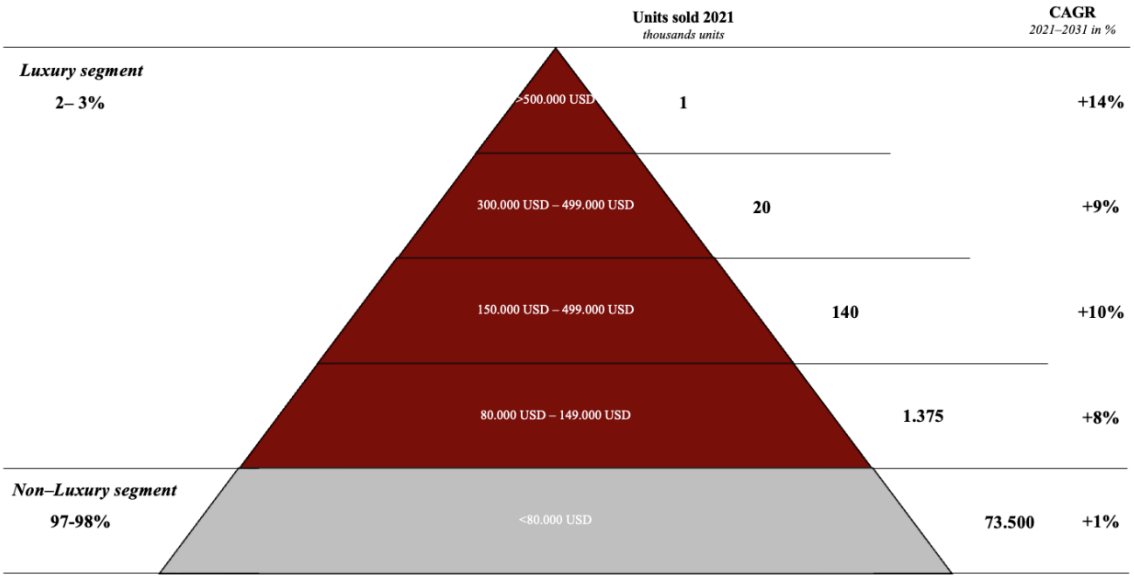


Figure 1.7 Luxury car market segmentation – Porsche and its peers (Created by authors based on the information's retrieved from the respective reports)

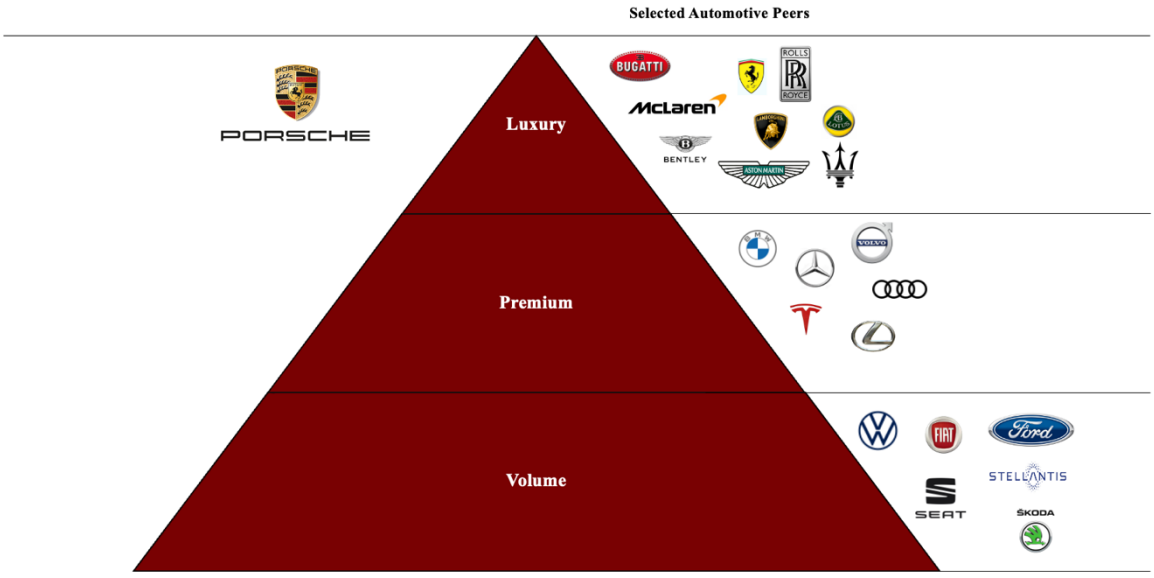


Figure 1.8 Global (U)HNWI populations development (Frank 2022)

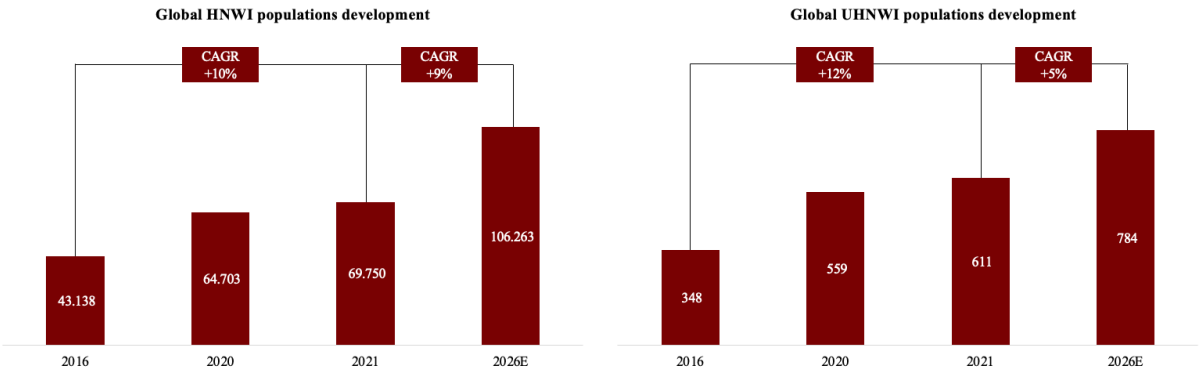


Figure 1.9 Sales Regression – (Created by authors)

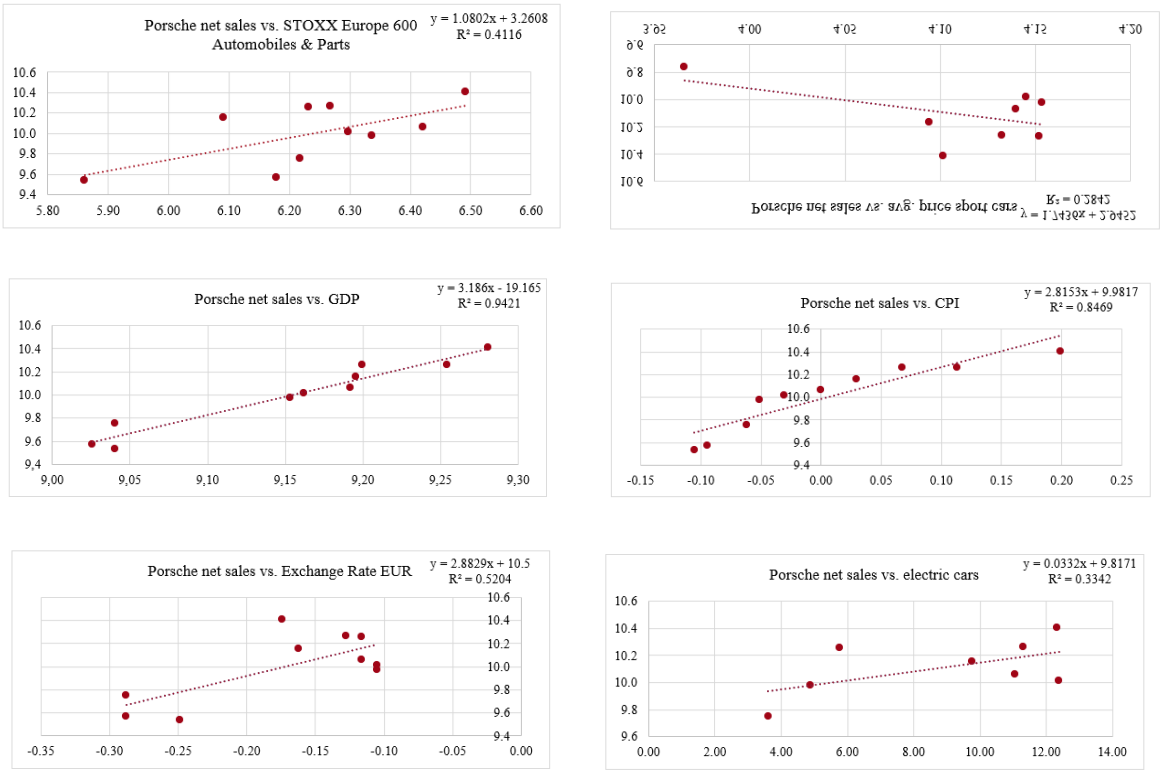


Figure 1.10 Forecast – Average selling price per product line (Created by authors)

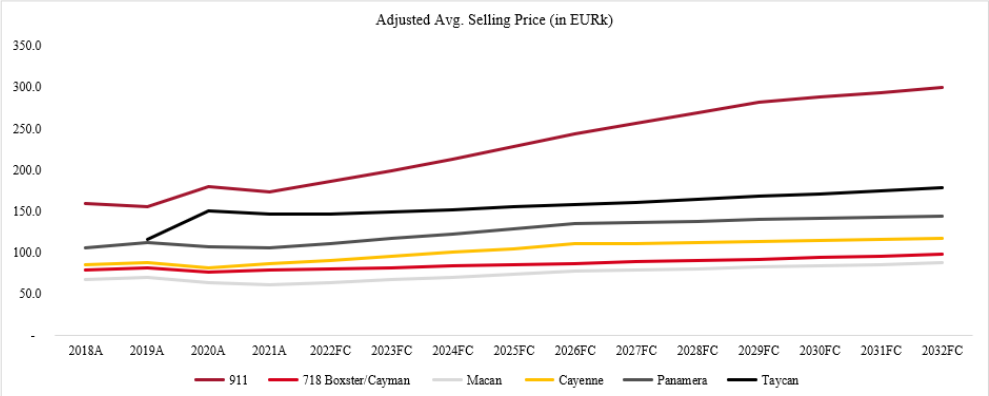


Figure 1.11 Forecast – Total vehicle sales per product line (Created by authors)

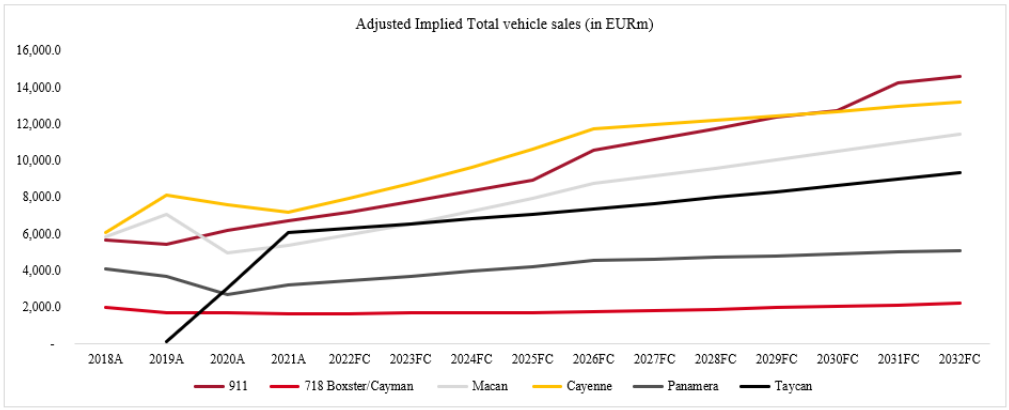


Figure 1.12 Long-Term Performance Analysis (Created by authors)

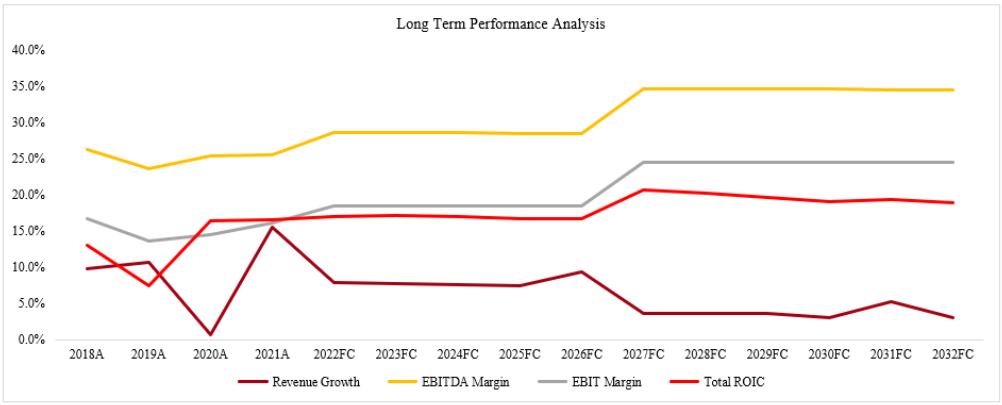


Figure 1.13 Porsche is outperforming luxury OEMs (Created by authors)

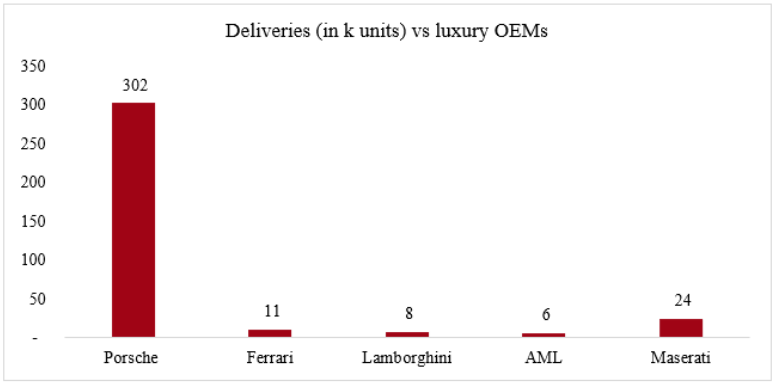


Figure 1.14 Porsche remains far more exclusive than premium OEMs (Created by authors)

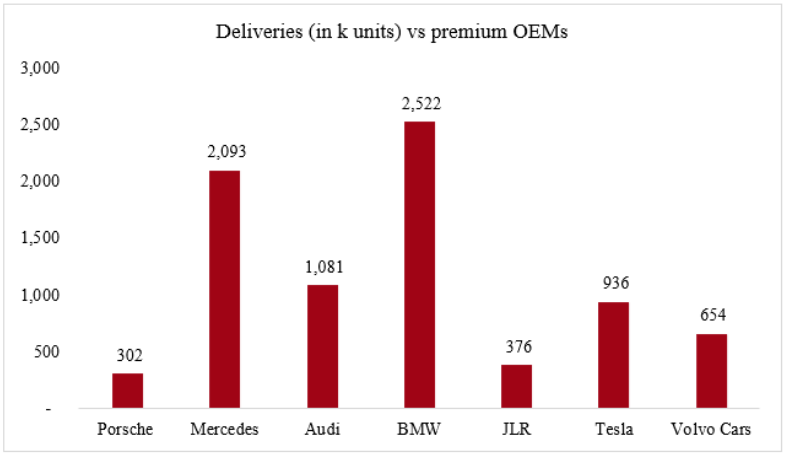


Figure 1.15 Porsche's average selling price is matching its luxury peers (Created by authors)

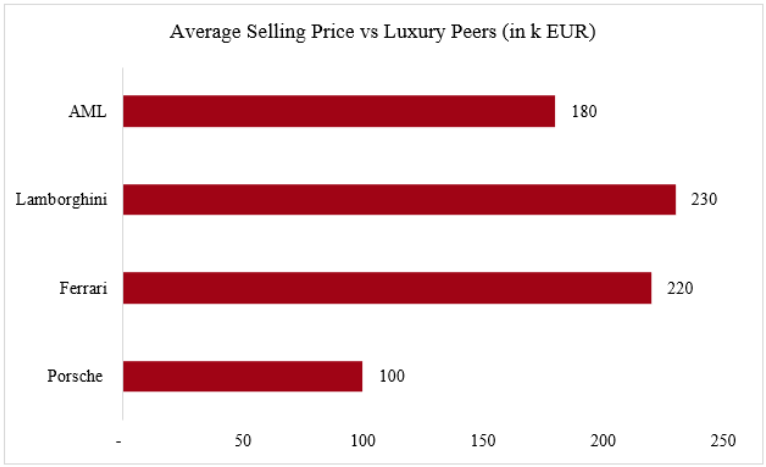


Figure 1.16 Porsche's average selling price compared to its premium peers (Created by authors)

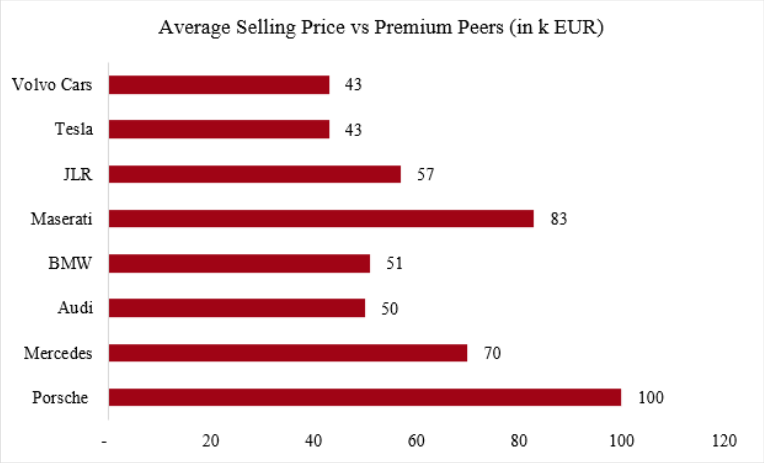
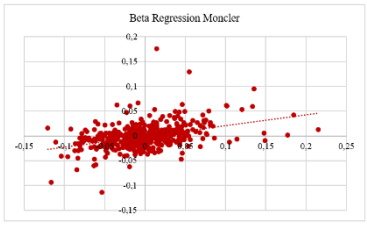


Figure 1.17 Beta Regressions (Created by authors)



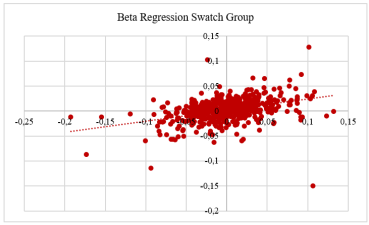


Figure 1.18 Cost of Debt YTM Calculations (Created by authors)

Volkswagen AG										
Description	**Maturity**	**Coupon**	**Coupon Rate (%)**	**FV**	**PV**	**YTM**	**YTM default-adj**	**Amount**	**Amount %**	**Weighted YTM**
VOWGL / VOWG 0.500 12-Jan-2029 MTN	8	0.5	0.5%	100	80.7	3.2%	3.1%	750,000,000	5.7%	0.2%
HTRAON / HTRA 0.750 24-Mar-2029 '28 MTN	8	0.75	0.8%	100	81.3	3.4%	3.3%	1,250,000,000	9.5%	0.3%
VOWGL / VOWG 4.625 25-Mar-2029 MTN	8	4.625	4.6%	100	98.7	4.8%	4.7%	500,000,000	3.8%	0.2%
VOWGVE / VOWG 4.250 29-Mar-2029 MTN	8	4.25	4.3%	100	97.0	4.7%	4.6%	750,000,000	5.7%	0.3%
VOWGVE / VOWG 3.000 11-Apr-2029 MTN	8	3	3.0%	100	89.2	4.6%	4.5%	200,000,000	1.5%	0.1%
VOWGS / VOWG 5.875 23-May-2029 MTN	8	5.875	5.9%	100	95.9	6.5%	6.4%	343,879,580	2.6%	0.2%
VOWGVG / VOWG 4.600 08-Jun-2029 '29	8	4.6	4.6%	100	91.9	5.9%	5.7%	473,350,374	3.6%	0.2%
VOWGVG / VOWG 4.600 08-Jun-2029 '29	8	4.6	4.6%	100	91.8	5.9%	5.8%	473,350,374	3.6%	0.2%
VOWGL / VOWG 0.625 19-Jul-2029 MTN	8	0.625	0.6%	100	79.1	3.6%	3.5%	750,000,000	5.7%	0.2%
VOWGVE / VOWG 1.625 16-Jan-2030 MTN	9	1.625	1.6%	100	82.5	3.9%	3.8%	1,000,000,000	7.6%	0.3%
VOWGF / VOWG 0.375 12-Feb-2030 MTN	9	0.375	0.4%	100	75.8	3.5%	3.4%	750,000,000	5.7%	0.2%
VOWGVG / VOWG 3.750 13-May-2030	9	3.75	3.8%	100	85.2	5.8%	5.7%	473,350,374	3.6%	0.2%
VOWGVG / VOWG 3.750 13-May-2030	9	3.75	3.8%	100	84.9	5.9%	5.8%	473,350,374	3.6%	0.2%
VOWGVE / VOWG 4.375 15-May-2030 MTN	9	4.375	4.4%	100	97.1	4.8%	4.7%	750,000,000	5.7%	0.3%
PSHG 4.250 27-Sep-2030 '30 MTN	9	4.25	4.3%	100	96.5	4.7%	4.6%	750,000,000	5.7%	0.3%
VOWGVE / VOWG 3.250 18-Nov-2030	9	3.25	3.3%	100	90.8	4.5%	4.4%	1,000,000,000	7.6%	0.3%
VOWGE / VOWG 4.625 03-May-2031 MTN	10	4.625	4.6%	100	96.5	5.1%	4.9%	500,000,000	3.8%	0.2%
VOWGL / VOWG 4.750 25-Sep-2031 MTN	10	4.75	4.8%	100	97.3	5.1%	5.0%	700,000,000	5.3%	0.3%
VOWGVE / VOWG 4.125 17-Nov-2031	10	4.125	4.1%	100	83.8	6.2%	6.1%	515,819,369	3.9%	0.2%
VOWGVE / VOWG 1.250 23-Sep-2032 MTN	11	1.25	1.3%	100	73.8	4.2%	4.1%	750,000,000	5.7%	0.2%
Total						**4.8%**	**4.7%**	**13,153,100,445**	**100.0%**	**4.5%**

Bayerische Motoren Werke AG										
Description	**Maturity**	**Coupon**	**Coupon Rate (%)**	**FV**	**PV**	**YTM**	**YTM default-adj**	**Amount**	**Amount %**	**Weighted YTM**
BMWGF / BMWG 1.500 06-Feb-2029 MTN	8	1.5	1.5%	100	89.1	3.0%	3.0%	1,500,000,000	15.5%	0.5%
BMWGC / BMWG 3.625 18-Apr-2029 '29	8	3.625	3.6%	100	90.5	5.1%	5.0%	615,297,236	6.4%	0.3%
BMWGC / BMWG 3.625 18-Apr-2029 '29	8	3.625	3.6%	100	90.6	5.0%	5.0%	615,297,236	6.4%	0.3%
BMWGF / BMWG 2.850 14-Aug-2029 '29	8	2.85	2.9%	100	86.4	4.9%	4.8%	473,305,566	4.9%	0.2%
BMWGF / BMWG 2.850 14-Aug-2029 '29	8	2.85	2.9%	100	86.5	4.9%	4.8%	473,305,566	4.9%	0.2%
BMWGF / BMWG 2.070 14-Feb-2030 MTN	9	2.07	2.1%	100	79.2	4.9%	4.8%	79,744,604	0.8%	0.0%
BMWGC / BMWG 4.150 09-Apr-2030 '30	9	4.15	4.2%	100	91.1	5.4%	5.3%	946,611,132	9.8%	0.5%
BMWGC / BMWG 4.150 09-Apr-2030 '30	9	4.15	4.2%	100	91.2	5.4%	5.3%	946,611,132	9.8%	0.5%
BMWGF / BMWG 3.350 17-Apr-2030 MTN	9	3.35	3.4%	100	87.4	5.1%	5.0%	48,411,340	0.5%	0.0%
BMWGF / BMWG 3.250 22-Jul-2030 MTN	9	3.25	3.3%	100	95.9	3.8%	3.7%	500,000,000	5.2%	0.2%
BMWGC / BMWG 2.550 01-Apr-2031 '31	10	2.55	2.6%	100	79.5	5.1%	5.1%	473,305,566	4.9%	0.2%
BMWGC / BMWG 2.550 01-Apr-2031 '31	10	2.55	2.6%	100	79.7	5.1%	5.0%	473,305,566	4.9%	0.2%
BMWGC / BMWG 1.950 12-Aug-2031 '31	10	1.95	2.0%	100	75.4	5.0%	5.0%	473,305,566	4.9%	0.2%
BMWGC / BMWG 1.950 12-Aug-2031 '31	10	1.95	2.0%	100	75.5	5.0%	4.9%	473,305,566	4.9%	0.2%
BMWGF / BMWG 1.000 18-Aug-2031 MTN	10	1	1.0%	100	78.9	3.5%	3.4%	150,000,000	1.5%	0.1%
BMWGF / BMWG 0.875 14-Jan-2032 MTN	11	0.875	0.9%	100	79.3	3.1%	3.0%	500,000,000	5.2%	0.2%
BMWGC / BMWG 3.700 01-Apr-2032 '32	11	3.7	3.7%	100	85.6	5.4%	5.3%	473,305,566	4.9%	0.3%
BMWGC / BMWG 3.700 01-Apr-2032 '32	11	3.7	3.7%	100	85.7	5.4%	5.3%	473,305,566	4.9%	0.3%
Total						**4.7%**	**4.7%**	**9,688,417,208**	**100.0%**	**4.6%**

Ferrari NV										
Description	**Maturity**	**Coupon**	**Coupon Rate (%)**	**FV**	**PV**	**YTM**	**YTM default-adj**	**Amount**	**Amount %**	**Weighted YTM**
RACE 1.500 27-May-2025	4	1.5	1.5%	100	96.2	2.5%	**2.4%**	450,963,000	-	-

Appendix Group Part

Mercedes-Benz Group AG										
Description	**Maturity**	**Coupon**	**Coupon Rate (%)**	**FV**	**PV**	**YTM**	**YTM default-adj**	**Amount**	**Amount %**	**Weighted YTM**
MBGNF / MBG 4.300 22-Feb-2029	8	4.3	4.3%	100	93.5	5.3%	5.2%	473,305,566	3.2%	0.2%
MBGNF / MBG 4.300 22-Feb-2029	8	4.3	4.3%	100	93.6	5.3%	5.1%	473,305,566	3.2%	0.2%
MBG 1.500 03-Jul-2029 MTN	8	1.5	1.5%	100	87.6	3.2%	3.1%	1,500,000,000	10.2%	0.3%
MBGNF / MBG 3.100 15-Aug-2029	8	3.1	3.1%	100	86.9	5.1%	4.9%	473,305,566	3.2%	0.2%
MBGNF / MBG 3.100 15-Aug-2029	8	3.1	3.1%	100	87.1	5.0%	4.9%	473,305,566	3.2%	0.2%
MBGIF / MBG 2.108 12-Oct-2029 MTN	8	2.1075	2.1%	100	100.9	2.0%	1.9%	199,397,023	1.4%	0.0%
MBG 1.375 11-Jan-2030 MTN	9	1.375	1.4%	100	84.5	3.4%	3.2%	185,000,000	1.3%	0.0%
MBG 0.750 08-Feb-2030 MTN	9	0.75	0.8%	100	82.2	3.0%	2.9%	750,000,000	5.1%	0.1%
MBGNF / MBG 2.625 10-Mar-2030	9	2.625	2.6%	100	82.8	5.0%	4.8%	425,975,009	2.9%	0.1%
MBGNF / MBG 2.625 10-Mar-2030	9	2.625	2.6%	100	82.9	4.9%	4.8%	425,975,009	2.9%	0.1%
MBG 2.375 22-May-2030 MTN	9	2.375	2.4%	100	90.6	3.6%	3.5%	750,000,000	5.1%	0.2%
MBG 0.750 10-Sep-2030 MTN	9	0.75	0.8%	100	80.5	3.2%	3.1%	1,000,000,000	6.8%	0.2%
MBGNF / MBG 8.500 18-Jan-2031	10	8.5	8.5%	100	116.2	6.4%	6.2%	1,419,916,698	9.7%	0.6%
MBG 2.000 27-Feb-2031 MTN	10	2	2.0%	100	87.9	3.4%	3.3%	750,000,000	5.1%	0.2%
MBGNF / MBG 2.450 02-Mar-2031	10	2.45	2.5%	100	79.6	5.0%	4.9%	473,305,566	3.2%	0.2%
MBGNF / MBG 2.450 02-Mar-2031	10	2.45	2.5%	100	79.7	5.0%	4.9%	473,305,566	3.2%	0.2%
MBGIF / MBG 3.700 30-May-2031 MTN	10	3.7	3.7%	100	97.7	4.0%	3.9%	1,000,000,000	6.8%	0.3%
MBG 1.125 06-Nov-2031 MTN	10	1.125	1.1%	100	80.1	3.5%	3.3%	1,000,000,000	6.8%	0.2%
MBG 0.750 11-Mar-2033 MTN	12	0.75	0.8%	100	74.4	3.3%	3.2%	1,000,000,000	6.8%	0.2%
MBGNF / MBG 5.050 03-Aug-2033	12	5.05	5.1%	100	92.1	5.9%	5.8%	709,958,349	4.8%	0.3%
MBGNF / MBG 5.050 03-Aug-2033	12	5.05	5.1%	100	92.2	5.9%	5.8%	709,958,349	4.8%	0.3%
Total						**4.4%**	**4.2%**	**14,666,013,833**	**100.0%**	**4.2%**

Volvo Car AB										
Description	**Maturity**	**Coupon**	**Coupon Rate (%)**	**FV**	**PV**	**YTM**	**YTM default-adj**	**Amount**	**Amount %**	**Weighted YTM**
VOLVT / VOLV 2.625 20-Feb-2026 '25 MTN	5	2.625	2.6%	100	97.0	3.3%	3.2%	8,243,575,144	16.9%	0.5%
VOLVT / VOLV 5.221 30-Mar-2026 FRN MTN	5	5.221	5.2%	100	100.8	5.0%	4.9%	500,000,000	1.0%	0.1%
VOLVT / VOLV 4.373 30-Mar-2026 MTN	5	4.373	4.4%	100	99.7	4.4%	4.3%	1,000,000,000	2.0%	0.1%
VOLVT / VOLV 18-May-2026 '26 MTN	5	0	0.0%	100	90.6	2.0%	1.9%	5,888,267,960	12.0%	0.2%
VOLVT / VOLV 4.750 15-Jun-2026 '26 MTN	5	4.75	4.8%	100	98.0	5.2%	5.1%	4,054,008,948	8.3%	0.4%
VOLVT / VOLV 3.875 29-Aug-2026 '26 MTN	5	3.875	3.9%	100	99.7	3.9%	3.8%	8,243,575,144	16.9%	0.6%
VOLVT / VOLV 2.500 18-Sep-2026 MTN	5	2.5	2.5%	100	94.7	3.7%	3.5%	1,295,418,951	2.6%	0.1%
VOLVT / VOLV 5.244 16-Nov-2026 FRN MTN	5	5.244	5.2%	100	101.2	5.0%	4.9%	1,000,000,000	2.0%	0.1%
VOLVT / VOLV 3.625 25-May-2027 '27 MTN	6	3.625	3.6%	100	98.8	3.8%	3.7%	5,888,267,960	12.0%	0.4%
VOLVT / VOLV 2.000 19-Aug-2027 '27 MTN	6	2	2.0%	100	93.2	3.2%	3.1%	5,888,267,960	12.0%	0.4%
VOLVT / VOLV 4.220 24-Nov-2027 MTN	6	4.22	4.2%	100	98.6	4.5%	4.4%	2,500,000,000	5.1%	0.2%
VOLVT / VOLV 3.700 14-Mar-2028 MTN	7	3.7	3.7%	100	97.8	4.1%	3.9%	353,296,078	0.7%	0.0%
VOLVT / VOLV 6.125 22-Jun-2028 '28 MTN	7	6.125	6.1%	100	101.6	5.8%	5.7%	4,054,008,948	8.3%	0.5%
Total						**4.2%**	**4.0%**	**48,908,687,093**	**100.0%**	**3.7%**

Burberry Group PLC										
Description	**Maturity**	**Coupon**	**Coupon Rate (%)**	**FV**	**PV**	**YTM**	**YTM default-adj**	**Amount**	**Amount %**	**Weighted YTM**
BRBY 1.125 21-Sep-2025 '25	4	1.125	1.1%	100	91.7	3.3%	**3.3%**	300,000,000	-	-

Compagnie Financiere Richemont SA										
Description	**Maturity**	**Coupon**	**Coupon Rate (%)**	**FV**	**PV**	**YTM**	**YTM default-adj**	**Amount**	**Amount %**	**Weighted YTM**
CFRXR / CFRX 1.000 26-Mar-2026 '25	5	1	1.0%	100	94.3	2.2%	2.1%	1,446,483,780	36.6%	0.8%
CFRXR / CFRX 0.750 26-May-2028 '28	7	0.75	0.8%	100	88.7	2.5%	2.4%	482,161,260	12.2%	0.3%
CFRXR / CFRX 1.500 26-Mar-2030 '29	9	1.5	1.5%	100	88.4	3.0%	2.9%	1,205,403,150	30.5%	0.9%
CFRXR / CFRX 1.125 26-May-2032 '32	11	1.125	1.1%	100	81.8	3.1%	3.0%	819,674,142	20.7%	0.6%
Total						**2.7%**	**2.6%**	**3,953,722,332**	**100.0%**	**2.6%**

EssilorLuxottica SA										
Description	**Maturity**	**Coupon**	**Coupon Rate (%)**	**FV**	**PV**	**YTM**	**YTM default-adj**	**Amount**	**Amount %**	**Weighted YTM**
ESLX 0.500 05-Jun-2028 '28 MTN	7	0.5	0.5%	100	87.8	2.4%	2.3%	1,250,000,000	55.6%	1.3%
ESLX 0.750 27-Nov-2031 '31 MTN	10	0.75	0.8%	100	80.8	3.0%	2.9%	1,000,000,000	44.4%	1.3%
Total						**2.7%**	**2.6%**	**2,250,000,000**	**100.0%**	**2.6%**

Kering SA										
Description	**Maturity**	**Coupon**	**Coupon Rate (%)**	**FV**	**PV**	**YTM**	**YTM default-adj**	**Amount**	**Amount %**	**Weighted YTM**
PRTP 1.875 05-May-2030 '30 MTN	9	1.875	1.9%	100	90.7	3.0%	2.9%	750,000,000	30.0%	0.9%
PRTP 3.625 05-Sep-2031 '31 MTN	10	3.625	3.6%	100	98.9	3.8%	3.6%	1,000,000,000	40.0%	1.5%
PRTP 3.375 27-Feb-2033 '32 MTN	12	3.375	3.4%	100	96.4	3.7%	3.6%	750,000,000	30.0%	1.1%
Total						**3.5%**	**3.4%**	**2,500,000,000**	**100.0%**	**3.4%**

LVMH Moet Hennessy Louis Vuitton SE										
Description	**Maturity**	**Coupon**	**Coupon Rate (%)**	**FV**	**PV**	**YTM**	**YTM default-adj**	**Amount**	**Amount %**	**Weighted YTM**
LVMH 3.250 07-Sep-2029 '29 MTN	8	3.25	3.3%	100	98.7	3.4%	3.4%	1,000,000,000	25.0%	0.8%
LVMH 0.375 11-Feb-2031 '30 MTN	10	0.375	0.4%	100	80.8	2.5%	2.5%	1,500,000,000	37.5%	0.9%
LVMH 3.500 07-Sep-2033 '33 MTN	12	3.5	3.5%	100	98.5	3.7%	3.6%	1,500,000,000	37.5%	1.3%
Total						**3.2%**	**3.1%**	**4,000,000,000**	**100.0%**	**3.1%**

Table 1.1 Management Board of Porsche AG (Created by authors based on the curriculum vitae of the respective board members)

Management Team	Position	Joined Porsche	Prior Companies	Education
Oliver Blume	Chairman of the Executive Board	2013	Audi, SEAT, VW	Mechanical Engineering at TU Braunschweig
Lutz Meschke	Deputy Chairman and Member of the Executive Board: Finance and IT	2001	KPMG, Hugo Boss	Business Administration at Cologne University
Andreas Haffner	Member of the Executive Board: Human Resources	1994	Porsche SE, VW	Law at University Koblenz
Detlev von Platen	Member of the Executive Board: Sales and Marketing	1997	BMW	Business Administration at University of Poitiers
Albrecht Reimold	Member of the Executive Board: Production and Logistics	2016	Audi, VW	Engineer at Technical College Heilbronn
Barbara Frenkel	Member of the Executive Board: Procurement	2001	TRW Automotive	Chemistry at Bayreuth University
Michael Steiner	Member of the Executive Board: Research and Development	2002	Mercedes, Daimler	Mechanical Engineering at TU Munich

Table 1.2 Platforms used for each model at Porsche (Created by authors; Andropoulos 2020)

Model	Production Site	Platform	Other models on the same platform
911	Stuttgart-Zuffenhausen	MMB	
Taycan	Stuttgart-Zuffenhausen	J1	Audi E-Tron GT
718 Boxter	Stuttgart-Zuffenhausen	MMB	
718 Cayman	Stuttgart-Zuffenhausen	MMB	
Panamera	Leipzig	MSB	Bentley
Macan	Leipzig	MLB evo	Audi Q5
Cayenne	Bratislava	MLB evo	Audi Q7, VW Touareg

Table 1.3 Historical average selling price modeling (Created by authors based on the information's retrieved from: Car and Drivers Magazine)

Adjusted Avg. Selling Price (in EURk)	*2018*	*2019*	*2020*	*2021*
911	*159.2*	*156.2*	*179.6*	*173.8*
718 Boxster/Cayman	*79.0*	*81.7*	*77.0*	*78.8*
Macan	*67.8*	*70.4*	*63.7*	*60.9*
Cayenne	*85.1*	*87.9*	*81.7*	*86.5*
Panamera	*106.4*	*111.8*	*107.7*	*106.2*
Taycan		*115.7*	*150.9*	*146.1*

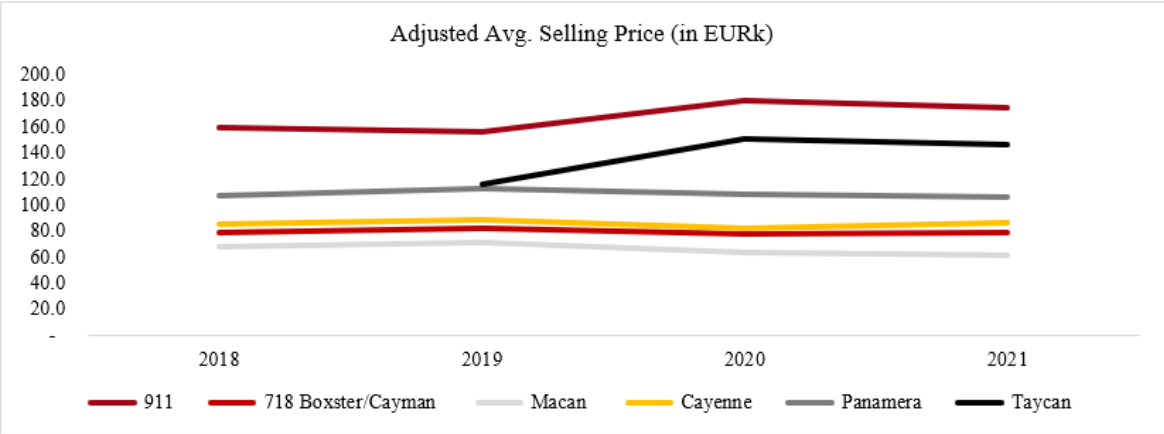


Table 1.4 Historical total vehicle sales development (Created by authors)

Adjusted Implied Total vehicle sales (in EURm)	*2018*	*2019*	*2020*	*2021*
911	*5,668.5*	*5,435.0*	*6,159.3*	*6,693.1*
718 Boxster/Cayman	*1,959.4*	*1,675.4*	*1,677.9*	*1,616.4*
Macan	*5,827.1*	*7,035.8*	*4,972.6*	*5,387.7*
Cayenne	*6,081.6*	*8,098.2*	*7,587.1*	*7,183.4*
Panamera	*4,084.1*	*3,656.8*	*2,702.5*	*3,208.6*
Taycan		*92.6*	*3,017.4*	*6,035.9*

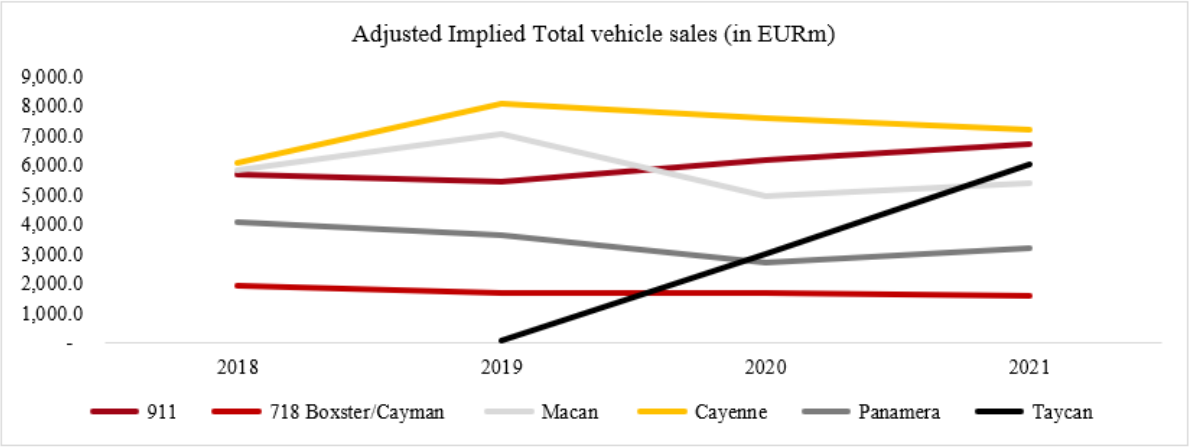


Table 1.5 Selected Comparable Universe

Selected Comparables	*Relevance*
Automotive Peers	
Aston Martin Lagonda Global Holdings PLC	●
Bayerische Motoren Werke AG	◕
Ferrari NV	●
Mercedes Benz Group AG	●
Stellantis NV	◑
Tata Motors Ltd	◕
Tesla Inc	◑
Volkswagen AG	◑
Volvo Car AB	◕
Automobili Lamborghini S.p.A.	◕
Maserati	◕
Jaguar Land Rover Automotive PLC	◑
Audi	◑

Selected Comparables	*Relevance*
Apparel and Accessories Peers	
Compagnie Financiere Richemont SA	◑
EssilorLuxottica SA	◔
Hermes International SCA	◑
Hugo Boss AG	◕
Kering SA	◕
LVMH Moet Hennessy Louis Vuitton SE	◕
Moncler SpA	◕
Prada SpA	◑
Swatch Group AG	◑

Table 1.6 Beta Analysis Peers (Created by authors)

	Peers	HQ	Tax rate	Lev. Beta	D/E	D/EV	EV-weighted	Unl. Beta D/E	Unl. Beta EV-weighted
Auto Manuf.	Aston Martin Lagonda Global Holdings PLC	UK	19.0%	2.28	361.0%	72.5%	0.3%	0.58	0.00
	Bayerische Motoren Werke Aktiengesellschaft	DE	30.0%	1.20	97.1%	64.5%	18.3%	0.72	0.13
	Ferrari NV	IT	24.0%	0.51	57.6%	3.7%	5.6%	0.35	0.02
	Mercedes-Benz Group AG	DE	30.0%	1.33	113.8%	64.2%	21.1%	0.74	0.16
	Tata Motors Ltd	IN	30.0%	1.71	257.0%	48.1%	4.0%	0.61	0.02
	Tesla Inc	US	27.0%	2.03	48.1%	-2.9%	48.4%	1.50	0.73
	Volvo Car AB	SWE	20.6%	1.43	-6.7%	-4.0%	2.4%	1.51	0.04
	Average							***0.86***	***1.10***
	Median							*0.72*	
	Average unl. Beta								***0.98***
Apparel & Access.	Burberry Group PLC	UK	19.0%	1.62	13.8%	3.3%	1.7%	1.46	0.02
	Compagnie Financiere Richemont SA	CH	14.9%	1.47	27.3%	9.2%	12.2%	1.20	0.15
	HUGO BOSS AG	DE	30.0%	1.21	77.5%	18.1%	0.9%	0.78	0.01
	Kering SA	FR	26.5%	1.02	46.5%	9.3%	13.9%	0.76	0.11
	LVMH Moet Hennessy Louis Vuitton SE	FR	25.0%	1.00	62.6%	9.9%	66.9%	0.68	0.45
	Moncler SpA	IT	24.0%	0.73	16.6%	3.6%	2.4%	0.65	0.02
	Swatch Group AG	CH	14.9%	0.88	-13.8%	-17.5%	1.9%	1.00	0.02
	Average							***0.93***	***0.77***
	Median							*0.78*	
	Average unl. Beta								***0.85***

Table 1.7 YTM Calculations (Created by authors)

	Company	YTM	YTM default-adj	Weighted YTM
Auto Manuf.	Volkswagen AG	4.8%	4.7%	4.5%
	Bayerische Motoren Werke AG	4.7%	4.7%	4.6%
	Ferrari NV	2.5%	2.4%	2.4%
	Mercedes-Benz Group AG	4.4%	4.2%	4.2%
	Volvo Car AB	4.2%	4.0%	3.7%
	Average	*4.1%*	*4.0%*	***3.9%***

	Company	YTM	YTM default-adj	Weighted YTM
Apparel & Access	Burberry Group PLC	3.3%	3.3%	3.3%
	Compagnie Financiere Richemont SA	2.7%	2.6%	2.6%
	EssilorLuxottica SA	2.7%	2.6%	2.6%
	Kering SA	3.5%	3.4%	3.4%
	LVMH Moet Hennessy Louis Vuitton SE	3.2%	3.1%	3.1%
	Average	*3.1%*	*3.0%*	***3.0%***

Table 1.8 Discounted Cash Flow Valuation (Created by authors)

Discounted Cash Flow Valuation												
	t = 0.25	*t = 1.25*	*t = 2.26*	*t = 3.26*	*t = 4.26*	*t = 5.26*	*t = 6.26*	*t = 7.26*	*t = 8.26*	*t = 9.26*	*t = 10.26*	
Full year financials:	31.12.22	31.12.23	31.12.24	31.12.25	31.12.26	31.12.27	31.12.28	31.12.29	31.12.30	31.12.31	31.12.32	
	2022	*2023*	*2024*	*2025*	*2026*	*2027*	*2028*	*2029*	*2030*	*2031*	*2032*	
(EURm)	*FC*	*FC*	*FC*	*FC*	*FC*	*FC*	*FC*	*FC*	*FC*	*FC*	*FC*	*TV*
Revenue	35,727.9	38,478.1	41,392.4	44,477.7	48,655.5	50,410.9	52,239.7	54,145.2	55,757.7	58,653.8	60,407.1	
Cost of sales	(25,009.5)	(26,934.7)	(28,974.6)	(31,134.4)	(34,058.8)	(32,767.1)	(33,955.8)	(35,194.4)	(36,242.5)	(38,125.0)	(39,264.6)	
SG&A	(3,920.2)	(4,221.2)	(4,545.2)	(4,893.8)	(5,375.5)	(5,005.8)	(5,192.0)	(5,386.3)	(5,549.6)	(5,847.6)	(6,025.5)	
EBITDA	10,196.0	10,981.6	11,809.1	12,679.5	13,848.5	17,432.3	18,060.1	18,714.0	19,268.4	20,259.5	20,862.0	
D&A	(3,583.3)	(3,859.1)	(4,151.4)	(4,460.8)	(4,879.8)	(5,055.9)	(5,239.3)	(5,430.4)	(5,592.2)	(5,882.6)	(6,058.5)	
EBIT	6,612.7	7,122.5	7,657.7	8,218.6	8,968.6	12,376.4	12,820.7	13,283.6	13,676.2	14,376.8	14,803.5	
NOPAT	4,628.9	4,985.7	5,360.4	5,753.0	6,278.0	8,663.5	8,974.5	9,298.5	9,573.4	10,063.8	10,362.5	
D&A	3,583.3	3,859.1	4,151.4	4,460.8	4,879.8	5,055.9	5,239.3	5,430.4	5,592.2	5,882.6	6,058.5	
Change in NWC	359.9	(653.5)	(605.1)	(540.7)	(565.0)	(127.6)	(304.4)	(314.8)	(285.5)	(425.6)	(305.1)	
Capex	(4,989.8)	(4,641.9)	(4,980.9)	(5,339.0)	(6,069.0)	(5,555.6)	(5,759.9)	(5,972.8)	(6,051.1)	(6,706.9)	(6,557.5)	
FCF	3,582.3	3,549.4	3,925.8	4,334.1	4,523.9	8,036.2	8,149.6	8,441.4	8,828.9	8,813.9	9,558.3	118,924.7
Present Value FCF	3,505.9	3,192.1	3,243.5	3,290.5	3,156.1	5,151.8	4,799.7	4,568.4	4,390.7	4,027.8	4,012.8	49,927.8

Table 1.9 Discounted Cash Flow Valuation results (Created by authors)

Valuation Date	**29.09.22**

Equity Bridge (in EURm)	Amount
Discount Rate (WACC)	8.8%
Core g in 2032	2.9%
Core RONIC in 2032	11.0%
Enterprise Value	**93,267.1**
Net Debt in 2021 (book value)	(5,877.5)
Non-Core Invested Capital (book value)	(6,021.0)
Equity Value	**81,368.6**
Shares outstanding	911
Implied Share Price	**89.3**
Share price 30.09.2022	82.5
Delta (abs.)	6.8
Delta (%)	8.3%

Table 1.10 Scenario Analysis – Pessimistic Case (Created by authors)

Valuation Date	**29.09.22**

Equity Bridge	
Discount Rate (WACC)	8.8%
Core g in 2032	2.9%
Core RONIC in 2032	11.0%
Enterprise Value	**89,772.2**
Net Debt in 2021 (book value)	(5,877.5)
Non-Core Invested Capital (book value)	(6,021.0)
Equity Value	**77,873.8**
Shares outstanding	911.0
Implied Share Price	**85.5**
Share price 30.09.2022	82.5
Delta (abs.)	3.0
Delta (%)	3.6%

Table 1.11 Scenario Analysis – Optimistic Case (Created by authors)

Valuation Date	**29.09.22**

Equity Bridge	
Discount Rate (WACC)	8.8%
Core g in 2032	2.9%
Core RONIC in 2032	11.0%
Enterprise Value	**96,893.3**
Net Debt in 2021 (book value)	(5,877.5)
Non-Core Invested Capital (book value)	(6,021.0)
Equity Value	**84,994.8**
Shares outstanding	911.0
Implied Share Price	**93.3**
Share price 30.09.2022	82.5
Delta (abs.)	10.8
Delta (%)	13.1%

Table 1.12 Sensitivity Analysis DCF – Share Price (Created by authors)

Share Price Sensitivity Analysis (in EUR)

Growth rate \ Share Price: 89.3	WACC 8.1%	8.4%	8.6%	8.8%	9.1%	9.3%	9.5%
2.6%	101.0	96.6	92.4	88.6	85.0	81.7	78.6
2.7%	101.5	96.9	92.7	88.8	85.2	81.9	78.7
2.8%	101.9	97.3	93.0	89.1	85.4	82.0	78.8
2.9%	102.3	97.6	93.3	89.3	85.6	82.2	79.0
3.0%	102.8	98.0	93.6	89.6	85.8	82.3	79.1
3.1%	103.2	98.4	93.9	89.8	86.0	82.5	79.2
3.2%	103.7	98.8	94.3	90.1	86.3	82.7	79.4

Δ EBITDA-margin (%) \ Share Price: 89.3	WACC 8.1%	8.4%	8.6%	8.8%	9.1%	9.3%	9.5%
-3.0%	85.4	81.3	77.6	74.1	70.9	67.9	65.2
-2.0%	91.0	86.7	82.8	79.2	75.8	72.7	69.8
-1.0%	96.7	92.2	88.1	84.3	80.7	77.4	74.4
0.0%	102.3	97.6	93.3	89.3	85.6	82.2	79.0
1.0%	108.0	103.1	98.6	94.4	90.5	86.9	83.6
2.0%	113.6	108.5	103.8	99.4	95.4	91.7	88.2
3.0%	119.3	113.9	109.0	104.5	100.3	96.4	92.8

Δ Sales growth p.a. (%) \ Share Price: 89.3	Δ EBIT-margin (%) -3.0%	-2.0%	-1.0%	0.0%	1.0%	2.0%	3.0%
-6.0%	92.9	97.9	103.0	108.1	113.1	118.2	123.3
-4.0%	86.2	91.3	96.3	101.4	106.5	111.5	116.6
-2.0%	80.0	85.0	90.1	95.2	100.2	105.3	110.4
0.0%	74.1	79.2	84.3	89.3	94.4	99.4	104.5
2.0%	68.6	73.7	78.8	83.8	88.9	94.0	99.0
4.0%	63.5	68.5	73.6	78.7	83.7	88.8	93.9
6.0%	58.6	63.7	68.8	73.8	78.9	83.9	89.0

Δ Sales growth p.a. (%) \ Share Price: 89.3	Δ COGS (%) -3.0%	-2.0%	-1.0%	0.0%	1.0%	2.0%	3.0%
-6.0%	125.3	119.5	113.8	108.1	102.3	96.6	90.9
-4.0%	117.9	112.4	106.9	101.4	95.9	90.4	84.9
-2.0%	111.0	105.7	100.4	95.2	89.9	84.6	79.3
0.0%	104.5	99.4	94.4	89.3	84.3	79.2	74.1
2.0%	98.4	93.6	88.7	83.8	79.0	74.1	69.2
4.0%	92.7	88.0	83.4	78.7	74.0	69.3	64.6
6.0%	87.3	82.8	78.3	73.8	69.3	64.8	60.3

Δ SG&A (%) \ Share Price: 89.3	Δ COGS (%) -3.0%	-2.0%	-1.0%	0.0%	1.0%	2.0%	3.0%
-3.0%	119.7	114.6	109.6	104.5	99.4	94.4	89.3
-2.0%	114.6	109.6	104.5	99.4	94.4	89.3	84.3
-1.0%	109.6	104.5	99.4	94.4	89.3	84.3	79.2
0.0%	104.5	99.4	94.4	89.3	84.3	79.2	74.1
1.0%	99.4	94.4	89.3	84.3	79.2	74.1	69.1
2.0%	94.4	89.3	84.3	79.2	74.1	69.1	64.0
3.0%	89.3	84.3	79.2	74.1	69.1	64.0	58.9

Table 1.13 Adjusted Present Value (Created by authors)

Adjusted Present Value Valuation	t = 0.25	t = 1.25	t = 2.26	t = 3.26	t = 4.26	t = 5.26	t = 6.26	t = 7.26	t = 8.26	t = 9.26	t = 10.26	
Full year financials:	31.12.22	31.12.23	31.12.24	31.12.25	31.12.26	31.12.27	31.12.28	31.12.29	31.12.30	31.12.31	31.12.32	
(EURm)	2022 Act	2023 FC	2024 FC	2025 FC	2026 FC	2027 FC	2028 FC	2029 FC	2030 FC	2031 FC	2032 FC	TV
Revenue	35,727.9	38,478.1	41,392.4	44,477.7	48,655.5	50,410.9	52,239.7	54,145.2	55,757.7	58,653.8	60,407.1	
EBITDA	10,196.0	10,981.6	11,809.1	12,679.5	13,848.5	17,432.3	18,060.1	18,714.0	19,268.4	20,259.5	20,862.0	
D&A	(3,583.3)	(3,859.1)	(4,151.4)	(4,460.8)	(4,879.8)	(5,055.9)	(5,239.3)	(5,430.4)	(5,592.2)	(5,882.6)	(6,058.5)	
EBIT	6,612.7	7,122.5	7,657.7	8,218.6	8,968.6	12,376.4	12,820.7	13,283.6	13,676.2	14,376.8	14,803.5	
NOPAT	4,628.9	4,985.7	5,360.4	5,753.0	6,278.0	8,663.5	8,974.5	9,298.5	9,573.4	10,063.8	10,362.5	
D&A	3,583.3	3,859.1	4,151.4	4,460.8	4,879.8	5,055.9	5,239.3	5,430.4	5,592.2	5,882.6	6,058.5	
Change in NWC	359.9	(653.5)	(605.1)	(540.7)	(565.0)	(127.6)	(304.4)	(314.8)	(285.5)	(425.6)	(305.1)	
Capex	(4,989.8)	(4,641.9)	(4,980.9)	(5,339.0)	(6,069.0)	(5,555.6)	(5,759.9)	(5,972.8)	(6,051.1)	(6,706.9)	(6,557.5)	
FCF	3,582.3	3,549.4	3,925.8	4,334.1	4,523.9	8,036.2	8,149.6	8,441.4	8,828.9	8,813.9	9,558.3	117,377.1
Present Value FCF	**3,505.3**	**3,189.2**	**3,238.3**	**3,282.8**	**3,146.4**	**5,132.4**	**4,778.2**	**4,544.7**	**4,364.7**	**4,001.1**	**3,983.4**	**48,916.6**
Financial Result before taxes	343.1	371.1	397.1	424.5	465.0	467.2	476.8	487.9	493.2	522.6	531.5	
Tax rate	30.0%	30.0%	30.0%	30.0%	30.0%	30.0%	30.0%	30.0%	30.0%	30.0%	30.0%	30.0%
Interest Tax Shield	102.9	111.3	119.1	127.3	139.5	140.1	143.1	146.4	148.0	156.8	159.5	1,451.1
Discount Rate	8.9%	8.9%	8.9%	8.9%	8.9%	8.9%	8.9%	8.9%	8.9%	8.9%	8.9%	8.9%
PV of Debt Tax Shield	**100.7**	**100.0**	**98.3**	**96.5**	**97.0**	**89.5**	**83.9**	**78.8**	**73.1**	**71.2**	**66.5**	**604.7**
Operating Enterprise Value	**3,606.0**	**3,289.2**	**3,336.5**	**3,379.3**	**3,243.5**	**5,221.9**	**4,862.1**	**4,623.5**	**4,437.9**	**4,072.3**	**4,049.8**	**49,521.3**

Table 1.14 Adjusted Present Value results (Created by authors)

Valuation Date	29.09.22

Equity Bridge	
Discount Rate Core FCF (Unlevered Equity Cost)	8.9%
Core g in 2032	2.9%
Core RONIC in 2032	11.0%
Discount Rate Tax Shield (Unlevered Equity Cost)	8.9%
Enterprise Value	**93,643.3**
Net Debt in 2021 (book value)	(5,877.5)
Non-Core Invested Capital (book value)	(6,021.0)
Equity Value	**81,744.9**
Shares outstanding	911.0
Implied Share Price	**89.7**
Share price 30.09.2022	82.5
Delta (abs.)	7.2
Delta (%)	8.8%

Table 1.15 Comparable Company Analysis (Created by authors)

Relevant Peers - Auto & Truck Manufactures							
Company	**Enterprise Value**	**Revenue**	**EBITDA**	**EBIT**	**EV/Sales**	**EV/EBITDA**	**EV/EBIT**
Aston Martin Lagonda Global Holdings PLC	*€ 2,094.7*	*€ 1,274.0*	*€ 160.4*		*1.6x*	*13.1x*	
Bayerische Motoren Werke AG	*€ 126,184.0*	*€ 111,239.0*	*€ 19,949.0*	*€ 13,454.0*	*1.1x*	*6.3x*	*9.4x*
Mercedes Benz Group AG	*€ 154,292.0*	*€ 133,893.0*	*€ 19,671.0*	*€ 4,605.0*	*1.2x*	*7.8x*	*33.5x*
Volvo Car AB	*€ 10,099.9*	*€ 27,819.1*	*€ 3,398.1*	*€ 1,926.9*	*0.4x*	*3.0x*	*5.2x*

Relevant Peers - Apparel & Accessories							
Company	**Enterprise Value**	**Revenue**	**EBITDA**	**EBIT**	**EV/Sales**	**EV/EBITDA**	**EV/EBIT**
Burberry Group PLC	*€ 11,659.0*	*€ 3,322.8*	*€ 983.0*	*€ 614.9*	*3.5x*	*11.9x*	*19.0x*
Christian Dior SE	*€ 194,591.6*	*€ 64,215.0*	*€ 22,215.0*	*€ 17,109.0*	*3.0x*	*8.8x*	*11.4x*
Compagnie Financiere Richemont SA	*€ 74,202.3*	*€ 16,748.0*	*€ 5,269.0*	*€ 3,793.0*	*4.4x*	*14.1x*	*19.6x*
Hugo Boss AG	*€ 4,557.4*	*€ 2,786.1*	*€ 505.0*	*€ 197.7*	*1.6x*	*9.0x*	*23.1x*
Kering SA	*€ 67,151.7*	*€ 17,645.2*	*€ 6,464.3*	*€ 5,017.2*	*3.8x*	*10.4x*	*13.4x*
LVMH Moet Hennessy Louis Vuitton SE	*€ 367,892.7*	*€ 64,215.0*	*€ 22,178.0*	*€ 17,121.0*	*5.7x*	*16.6x*	*21.5x*
Swatch Group AG	*€ 10,872.3*	*€ 6,768.3*	*€ 1,350.3*	*€ 945.0*	*1.6x*	*8.1x*	*11.5x*

Table 1.16 Comparable Transaction Analysis (Created by authors)

Relevant Transactions - Auto & Truck Manufacturers			Target EV		Implied multiples	
Date effective	**Target**	**Acquiror**	**(EURm)**	**EV/Sales**	**EV/EBITDA**	**EV/EBIT**
25.09.2015	Volkswagen AG	Porsche Automobil Holding SE	*€ 523.0*		*5.1x*	*10.6x*
03.01.2016	Ferrari NV	Fiat Chrysler Automobiles NV - Shareholders		*3.4x*	*12.1x*	*17.9x*
15.09.2016	Pos Malaysia Bhd	HICOM Holdings Bhd	*€ 259.7*	*0.7x*	*6.8x*	*15.3x*
26.01.2018	Volvo AB	Zhejiang Geely Holding Group Co Ltd	*€ 47,390.0*	*1.4x*	*9.8x*	*15.4x*
29.12.2018	AVTOVAZ PAO	Alliance Rostec Auto BV	*€ 1,681.5*	*0.5x*	*9.5x*	*18.6x*
31.12.2018	Renk AG	Volkswagen AG	*€ 454.4*	*1.0x*	*5.8x*	*7.7x*
06.02.2020	SUBARU CORP	Toyota Motor Corp	*€ 11,024.5*	*0.5x*	*4.5x*	*8.7x*
29.05.2020	WABCO Holdings Inc	ZF Friedrichshafen AG	*€ 6,748.0*	*2.0x*	*13.2x*	*16.8x*
21.08.2020	Williams Grand Prix Engineering Ltd	BCE Ltd			*5.7x*	*7.3x*
20.12.2021	Hyundai Capital Services Inc	Kia Corp	*€ 15,417.9*	*20.3x*	*19.7x*	*20.3x*

Relevant Transactions - Apparel & Accessories			Target EV		Implied multiples	
Date effective	**Target**	**Acquiror**	**(EURm)**	**EV/Sales**	**EV/EBITDA**	**EV/EBIT**
03.08.2016	Moncler SpA	Temasek Holdings Pte. Ltd.; Juan Carlos Torres	*€ 4,260.5*	*4.9x*	*14.5x*	*16.5x*
01.08.2016	Tumi Holdings Inc	Samsonite International SA	*€ 1,536.6*	*3.1x*	*14.5x*	*17.7x*
15.07.2016	Stroili Oro S.p.A.	THOM Europe SAS			*8.8x*	*10.9x*
15.07.2016	Pacific Brands Ltd	Hanesbrands Inc	*€ 701.7*	*1.2x*	*12.5x*	*14.8x*
27.02.2017	Burberry Group Plc	Groupe Bruxelles Lambert SA	*€ 7,955.1*	*2.7x*	*12.7x*	*16.8x*
25.04.2017	Christian Dior Couture SA	Semyrhamis SA (owned by Groupe Arnault SE)	*€ 46,931.8*	*1.4x*	*5.9x*	*7.9x*
03.07.2017	Christian Dior Couture S.A.	LVMH Moet Hennessy Louis - Vuitton SE	*€ 6,500.0*	*3.5x*	*19.0x*	
01.11.2017	Jimmy Choo PLC	Jag Acquisitions (UK) Ltd	*€ 1,180.0*	*2.8x*	*15.7x*	*22.5x*
22.03.2019	Koramco Reits Management & Trust Co Ltd	LF Corp	*326,57*	*3.3x*	*6.9x*	*7.0x*
03.10.2019	Sotheby's	Patrick Drahi	*€ 3,209.6*	*3.5x*	*17.3x*	*19.9x*
07.01.2021	Tiffany & Co.	LVMH Moet Hennessy Louis - Vuitton SE	*€ 14,724.3*	*3.7x*	*15.9x*	*20.5x*
25.01.2021	THOM Europe SAS	Altamir Amboise			*7.5x*	

Appendix

Table 2.1 Hypothesis descriptions

Hypothesis	Variable	Explanation	Expected Influence
H_1	Offered Ownership (%)	Higher offering percentages will lead to increased underpricing and, consequently, higher initial returns.	Positive
H_2	Average Volatility (30 Days)	There is an inverse relationship between favorable market conditions and the initial return.	Negative
H_3	Advisor	IPOs handled by prestigious advisors and underwriters are anticipated to have reduced risk profiles, and as a result, they are expected to yield lower initial returns.	Negative
H_4	Hot Period	IPOs listed during hot market periods will exhibit higher initial returns compared to IPOs listed during cold market periods.	Positive
H_5	After Crisis	The ongoing economic recession is likely to result in a reduction in underpricing.	Negative

Table 2.2 Underlying assumptions for the regression analysis

Number	Assumption	Description
1	Linearity	The relationship between variables should be linear.
2	Independence of errors	Residuals should be independend.
3	Homoscedasticity	The variance of errors should be constant.
4	Normality of errors	Residuals should be approximately normally distributed.
5	No multicollinearity	Independent variables should not be highly correlate.
6	No endogeneity	Independent variables shouldn't be correlated with errors.

Gujarati (2022)

Table 2.3 Model test results

Verification	Test	Result	Adjustment
Autocorrelation	Durbin-Watson-Test	No autocorrelation	n.a.
Multicollinearity	Variane Inflaction Factos Pearson Correlation Matrix	No Multicollinearity	n.a.
Homoscedasticity	Breusch-Pagan Test	Heteroscedasticity	Robust stadard errors
Omitted variable bias	Ramsey RESET test	No omitted variable bias	n.a.
Normality of residuals	Shapiro-Wilk normality test	Normal distribution	n.a.

Table 2.4 Pearson correlation matrix

	Offered Ownership	Average Volatility (30 Days)	Advisor	Hot Period	After Crisis	ln Deals Size	ln Market Cap at Offering	Adjusted First Day Return
Offered Ownership	1							
Average Volatility (30 Days)	0.088	1						
Advisor	-0.116	0.062	1					
Hot Period	-0.074	-0,064	-0.237	1				
After Crisis	-0.192	0.062	0.157	0,084	1			
ln Deals Size	0.004	-0.132	0.490	0.006	0.157	1		
ln Market Cap at Offering	-0.125	-0.047	0.411	-0.047	0.181	0.569	1	
Adjusted First Day Return	0.148	-0.198	-0.472	0.027	-0.177	-0.196	-0.180	1

Table 2.5 Variance Inflation Factor (VIF)

Variable	VIF	1/VIF
Offered Ownership	1.181	0.847
Average Volatility (30 Days)	1.020	0.981
Advisor	1.219	0.820
Hot Period	1.137	0.879
After Crisis	1.145	0.873
ln Deals Size	2.224	0.449
ln Market Cap at Offering	1.871	0.534
Mean	1.399	0.715

Table 2.6 Legend

Name	Abbreviation
Offered Ownership	OO
Average Volatility (30 Days)	VO3
Advisor	ADV
Hot Period	HOT
After Crisis	AC
ln Deals Size	DS
ln Market Cap at Offering	MC
Adjusted First Day Return	Aperf

Table 2.7 Summary parameter

Variable	N	Mean	Median	Std. dev.	Min.	Max.
Offered Ownership	145	0.27	0.35	0.16	0.05	0.65
Average Volatility (30 Days)	145	16.84	15.92	5.37	4.93	36.27
Advisor	145	0.57	1	0.49	0	1
Hot Period	145	0.48	1	0.42	0	1
After Crisis	145	0.18	0	0.37	0	1
Deals Size (in m)	145	€ 564.39	€ 163.85	€ 1618.46	€ 0.37	€ 9081.67
Market Cap at Offering (in bn)	145	€ 2.25	€ 0.39	€ 6.25	€ 0.01	€ 32.56

Table 2.8 Yearly descriptive analysis for annual 90% winsorization initial-day performance

Year	N	Mean	Median	Std. dev.	Min.	Max.
2010	18	1.57%	0.89%	5.87%	-8.98%	13.39%
2011	14	0.90%	-1.32%	7.96%	-13.36%	17.29%
2012	10	-1.92%	0.57%	10.22%	-30.39%	5.60%
2013	7	2.19%	-0.12%	8.56%	-9.55%	18.70%
2014	11	0.08%	1.44%	5.56%	-9.78%	8.29%
2015	16	2.73%	2.01%	8.23%	-19.12%	16.95%
2016	7	5.65%	2.52%	6.41%	0.52%	16.94%
2017	12	8.93%	7.61%	12.53%	-10.62%	36.60%
2018	19	2.72%	1.68%	8.43%	-8.90%	28.56%
2019	5	3.18%	-3.26%	17.52%	-9.16%	34.15%
2020	7	6.12%	0.59%	19.07%	-11.62%	44.92%
2021	17	5.26%	2.88%	10.72%	-7.46%	37.38%
2022	2	0.43%	0.43%	1.84%	-0.88%	1.73%
Total	145	3.00%	1.32%	9.73%	-30.39%	44.92%

Table 2.9 Industry descriptive analysis for 90% winsorization initial-day performance

Industry	N	Mean	Median	Std. dev.	Min.	Max.
Basic Materials	5	6.78%	8.06%	5.23%	0.59%	12.22%
Communications	19	3.29%	1.23%	13.45%	-19.12%	37.38%
Consumer, Cyclical	35	1.57%	1.10%	9.16%	-30.39%	34.15%
Consumer, Non-cyclical	15	1.79%	-0.17%	7.32%	-7.46%	18.70%
Energy	5	-0.60%	0.02%	3.03%	-5.03%	3.13%
Financial	28	1.82%	1.72%	6.65%	-10.62%	13.77%
Industrial	22	5.51%	1.78%	11.48%	-13.36%	36.60%
Technology	13	6.24%	2.42%	13.29%	-6.08%	44.92%
Utilities	2	2.71%	2.71%	3.10%	0.52%	4.90%
Total	145	3.00%	1.32%	9.73%	-30.39%	44.92%

Table 2.10 Results of all regression models

Variable	OLS	Robust	Industry	Year	Industry + Year
Offered Ownership	-0.029	-0.030	-0.027**	-0.086	-0.052
	(0.701)	(0.719)	(0.041)	(0.230)	(0.167)
Average Volatility (30 Days)	-0.003*	-0.004	-0.003	0.003	0.001
	(0.085)	(0.261)	(0.236)	(0.139)	(0.158)
Advisor	-0.128***	-0.127***	-0.115***	-0.106***	-0.112***
	(0.001)	(0.001)	(0.000)	(0.000)	(0.000)
Hot Period	-0.035	-0.032	-0.029**	0.008	-0.011*
	(0.178)	(0.195)	(0.028)	(0.801)	(0.097)
After Crisis	-0.018	-0.018	-0.017***	n.a	n.a
	(0.513)	(0.411)	(0.003)		
ln Deals Size	-0.003	-0.003	-0.005	0.019	0.008
	(0.902)	(0.908)	0.734	(0.111)	(0.514)
ln Market Cap at Offering	0.004	0.004	0.005	-0.021	-0.006
	(0.850)	(0.841)	(0.677)	(0.144)	(0.680)
Constant	0.243*	0.243	n.a.	n.a.	n.a.
	(0.093)	(0.162)			
No. of observations	145	145	133	127	121
R^2	0.268	0.268	0.322	0.368	0.356
p - Value	0.001***	0.001***	0.004***	0.012**	0.0011**
Robust standard erros	No	Yes	Yes	Yes	Yes
Year-fixed effects	No	No	No	Yes	Yes
Industry-fixed effects	No	No	Yes	No	Yes

Note: *p< 0.1; **p< 0.05; ***p<0.01