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Bausch + Lomb Company Valuation – Estimating Valuation Multiples based on Multiple Regressions

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Abstract: This work project conducts a company valuation of Bausch + Lomb and evaluates different exit options for the company. The individual part consists of a valuation based on a multiple regression approach. The group part consists of Bausch + Lomb's valuation based on a discounted cash flow model (DCF) and relative valuation approaches. Considering the DCF model, B + L's enterprise value is estimated at $7,325 mn as of 31/12/2021.

Keywords: Bausch + Lomb; Company valuation; Acquisition; Pharmaceuticals; Eye care

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1 Company description

Bausch + Lomb (B + L or Bausch + Lomb) was founded in 1853 as an optical goods shop in New York by John Jacob Bausch and Henry Lomb in Rochester. Today, B + L is a leading global eye care company that supports its customers in their daily activities with contact lenses and eye drops, but also in the cure process with pharmaceutical products for post-operative eye care treatments. As of 31/12/2021, the company has more than 12,500 employees, operates in more than 100 countries and has over 400 products in place. In its early years around 1900, B + L focused on eyeglasses, microscopes and binoculars after which the company opened its first mass production of contact lenses in 1971 and onwards focused on eye care products. From 1958-2007 the company was listed on the NYSE. In 2007, B + L got acquired by the private equity firms Warburg Pincus, LLC, and Welsh, Carson, Anderson & Stowe. The last major change in ownership occurred in 2013, when Bausch Health Companies Inc. (formerly Valeant Pharmaceuticals Inc.) bought B + L for around $8.7 bn. In 1990, B + L acquired Storz® Ophthalmic and Chiron Vision, from which the company built up its surgery division, expanding its product portfolio from contact lenses, consumer health care and pharmaceuticals.

As of 31/12/2021, B + L is divided into three business units: Vision Care/Consumer Health Care, Ophthalmic Pharmaceuticals and Surgical. Vision Care is considered the largest business segment with $2,343 mn in revenue in 2021 (62%). Ophthalmic Pharmaceuticals and the surgical business unit each correspond to around 19%. The Vision Care/Consumer Health Care segments consist of the contact lens business and the consumer eye care business. The Ophthalmic Pharmaceutical division develops and sells proprietary pharmaceutical products for post-operative treatments as well as products for eye diseases. The Surgical business generates revenues through the sale of medical equipment and instruments for necessary surgeries. In addition, B + L develops technologies for the treatment of, e.g., cornea, cataract,

and retina. The largest customer group based on regions is the U.S. & Puerto Rico with 43% of total revenues, followed by China (10%) and Japan (6%). B + L is well diversified across its business units. The Vision Care / Consumer Health Care segment includes seven product franchises with each generating more than 100 million in revenue in 2021. The Ophthalmic Pharmaceuticals segment includes over 100 products, with each representing less than 15% of the revenue of this business segment. Furthermore, B + L has over 100 products in its product pipeline. A broad product portfolio such as Bausch + Lomb's allows for diversification and more stable cash flows. The company operates in an innovative, dynamic, and competitive environment that influences its entrepreneurial actions and strategies. Demographic change, the increasing number of diseases, access to medical care and pressure from governments are just some of the external influences that the company must consider in its strategy. An important factor for the future success of a company is its management. B + L has a strong management team, led by Joseph C. Papa, the current CEO. Papa has over 35 years of experience in the pharmaceutical industry and was CEO and COO in several pharmaceutical companies, including Perrigo and Watson Pharmaceuticals. Christina Ackermann serves as Executive Vice President, General Counsel at B + L since 2016. Prior to this position, Ackermann worked as General Counsel at Alcon, a competitor of B + L and a former part of the Novartis Group. Sam Eldessouky is the current CFO of B + L. Prior, Eldessouky worked for Tyco International, plc (a security company which merged with Johnson Controls in 2016) and executed various spin-offs. To sum up, the management team of B + L is highly qualified, proved their knowledge and execution power in several other pharmaceutical companies and is able to further expand the company’s business activity.

2 Industry analysis

2.1 Historical performance and size estimation

The global **Vision Care industry** represents items that deal with visual issues and their repair (Contact lenses, solutions, spectacles etc.). The global market stood at $118.5 bn in 2020, posting an 8.6% decline compared to the industry peak of $138.4 bn in 2019. The decline was mostly a side effect of the COVID-19 pandemic on the economy, which forced companies to shut down production plants, disrupted supply chains, and consequently lowered industry sales. The effect on the vision care industry was apparent as it resulted in whipping off $19.9 bn in the global sale (Euromonitor International 2021). Contact lenses and solutions represent a mere 16.5% ($19.6 bn) of the overall industry, while sunglasses and spectacles represent the majority (Euromonitor International 2021). Between the years 2020 and 2025, the overall vision care market is expected to grow at a compound annual growth rate ($CAGR_{2019-2025}$) of 3.8%, finishing the year 2025 at a new market high of $172.9 bn. The market for contact lenses and solutions is expected to grow at a lower rate of 3.1% (*Appendix 1*) (Euromonitor International 2021).

The global pharmaceutical industry in 2020 was estimated to be worth $1,242.4 bn and is expected to grow at a $CAGR_{2019-2025}$: 4.8% (Fitch Solutions 2021, 4). The **Ophthalmic Pharmaceutical** segment refers to goods that are recommended by physicians and intended for the treatment of any eye-related conditions or to cure any eye disorders (Tashakori-Sabzevar and Mohajeri 2015, 1). It represents a small (3.2%) portion of the overall pharmaceutical industry, which in 2020 amounted to $39.7 bn, posting an above-average growth of 8.8%. The industry is expected to grow at a $CAGR_{2019-2025}$: 5.6%. (*Appendix 2*) (Kishor and Linu 2021).

Ophthalmic Surgical Equipment falls under a larger industry of surgical and medical equipment. The industry is expected to grow at a $CAGR_{2019-2025}$: 5.6% (*Appendix 3*) (Statista 2021). The market was valued at $28.7 bn in 2020. However, after a 7.3% drop in 2020 it is expected to recover in 2021 and reach a new peak of $31.9 Bn in 2021 (Statista 2021).

2.1.1 Future outlook and key growth drivers

The vision market is poised to grow in the foreseeable future due to demographic and lifestyle factors. The first and most noticeable factor is the growth of the aging population around the world. The number of people aged 55 and over is expected to increase from 1.4 bn to 2.1 bn in the span of 20 years (2020 – 2040) (*Appendix 4*). Combining this with lower birth rates in most developed countries, the population of people above 55 years old is expected to represent 24.7% of the world population by 2040 compared to 15.5% in 2010 (United Nations - Department of Economic and Social Affairs 2022). The number of people suffering from cataracts, age-related macular degeneration (AMD), and glaucoma increased by 20% to 25% between 2000 and 2010 and is expecting to continue as aging population grows (Pathipati and Tsai 2018, 5). Lifestyle factors are also driving factors for the growth of the industry. The most important areas are personal health and individual nutrition. There is a high correlation between diabetes and eyesight problems, such as diabetic retinopathy (DR), which is the most common cause of blindness in people (Gardner TW, Wyckoff JA, Shah AR, et al. 2019, 1). The number of people with diabetes in 2021 reached 537.0 mn and is expected to grow further in the following years. The estimated number of people suffering from diabetes is expected to increase by 45.8% to 783.0 mn people by 2045 (International Diabetes Federation 2021, 4). On top of that factors like long exposure to electronic devices, less time spent outdoors, increased urbanization, and an increase in near-sighted tasks are factors that potentially increase the probability and, thus the number of eye problems such as dry eye, redness, blurred vision as well as myopia, which has been on the rise over the past decades (Geneva: World Health Organization 2019, 43).

2.2 Regulatory environment

The factors described in the previous chapter will drive the growth inside the industry, expand the total addressable market, and open new opportunities for B + L and its competitors. However, the health industry faces a strong and complex governmental as well as environmental regulatory environment. Government authorities all over the world regulate companies' research and development, testing, approval, manufacturing as well as packaging and distribution of pharmaceutical products and devices. These products are under detailed regulation both before and after approval. Organizations like Food and Drug Administration (FDA) in the US are in charge of approving products before launched in the market (Bausch + Lomb Corporation 2022). Moreover, companies are heavily regulated through manufacturing, commercialization, data protection regulations as well as regulations against fraud and abuse. (Bausch + Lomb Corporation 2022, 181). On top of governmental regulations, pharmaceutical companies like B + L must also comply with a broad range of environmental laws and regulations concerning the manufacturing, handling, transportation, and storage as well as with the disposal of materials, such as the discharge of pollutants, hazardous substances, and other waste into the environment (Bausch + Lomb Corporation 2022, 184). Meeting regulatory requirements requires companies to incur large capital expenditures to set up the right procedures, acquire appropriate human capital and maintain compliance. This can have a significant impact on the company's cash flows while restricting newcomers from entering the industry. Nevertheless, if companies fail to meet the regulations, laws, or rules, they potentially face serious criminal as well as civil damages, fines, or even exclusion from any state healthcare assistance programs (Bausch + Lomb Corporation 2022, 185).

2.3 Overall market conclusion

Taking into consideration the industry analyses for contact lenses and solutions, ophthalmic pharmaceuticals, and ophthalmic devices, the overall industry in which B + L operates was

estimated to be worth $89.8 bn in 2020 (*Appendix 5*). The overall market recorded a drop in 2020 of 1.4%, mainly driven by an 8.4% drop in the market of contact lenses and solutions and a 7.3% drop in the market of ophthalmic devices. Nevertheless, the market is expected to recover in 2021 with a growth of 7.0% and grow at a $CAGR_{2019\text{-}2025}$ of 5.3%. Understanding the size, growth drivers, competitor past performance as well as the regulatory environment provides insights that are later used in the valuation of the company as well as determining the growth rate at which the company will grow in the future.

3 Macroeconomic and demographic analysis

3.1 A general assessment of the macroeconomic situation

In March 2020, the world was hit by the global COVID-19 pandemic, which caused markets to turmoil and brought several businesses to a halt. It has been a shock to the economy from the supply side (supply chain halts) as well as from the demand side (state and global lockdowns). The gross domestic product (GDP) of all major economies fell, unemployment soared, and the global capital markets plummeted. Nevertheless, in late 2020 and 2021, the world experienced a fast recovery with high economic growth. According to predictions, the United States is expected to accelerate growth following a 3.5% decline in 2020 (OECD 2021, 13). Nevertheless, the economic recovery has seemed to be uneven, with developed economies recovering much faster and stronger than undeveloped parts of the world (*Appendix 6*). While 90% of advanced economies are expected to return to their pre-pandemic levels by the end of 2021, the developing countries remain below pre-pandemic projections. The vaccine rollout in Emerging Markets and Developing Economies (EMDE) remains slower compared to developed countries. Ongoing national lockdowns and, in some cases, macroeconomic withdrawal have proved to all result in a slower economic recovery in those areas of the world (World Bank 2021, xvii).

3.2 Economic outlook

Following a period of economic recovery with expanding monetary and fiscal measures, the outlook for the economy, as well as the optimism in the market, started fading away in late 2021. The concern about the economic outlook was guided by the increasing number of COVID-19 infections, new virus variant (SARS-CoV-2 Omicron), uncertainty about the continuous recovery and high inflation pressures due to low-interest rates and government stimuli to the economy (IMF 2021a, xi). A year of a favourable economic environment with low-interest rates and cheap cost of capital has brought upward pressure on inflation, which pushed nominal yields higher and, in some countries, entirely reversed their earlier moves. Inflation is expected to rise above the targeted 2.0% in 2021 and remains there at least until 2024 (*Appendix 7*) (Federal Reserve 2021, 2). This pressure leaves policymakers uncertain between two possibilities: short-term support for the economy while preventing medium-term financial instability (IMF 2021a, xi). If no actions are taken, the economy may face too high asset valuations and could result in financial instability or even recessionary pressures.

3.3 Risks

Companies were challenged by the problems presented by the COVID-19 pandemic. However, governments and central banks with monetary and fiscal measures made the environment favourable for borrowing money and continuous growth. Following the flourishing period, the risks of higher inflation, interest rate hikes, as well as supply chain challenges, remain. Central banks are expected to raise rates which will put upward pressure on the cost of capital and make it less favourable to borrow money. At the same time, higher inflation predictions will challenge corporates to preserve profit margins as their costs increase. Lastly, the Supply chain crisis and shortages put pressure on companies to adapt and restructure their current supply chain operations as well as regionalize their operations, which is expected to come at high capital expenditures (Gourang Shah et al. 2022, 22).

4 M&A vs IPO

4.1 Introduction

The nature of the economy and its underlying markets is an ever-evolving process in which companies constantly face new challenges and opportunities, triggering them to realign their strategic focus. Together with the ongoing globalization and rapid technological advancements, this fast-paced environment has prompted firms to shift away from traditional organic growth models to inorganic means in order to gain and maintain their competitiveness. Mergers & Acquisitions (M&A) and Initial Public Offerings (IPO), among others, are considered as strategic transactions that have an integral part in today's corporate decision making (Frankel 2005, ix). While M&A and IPO are both comparable paths to access capital, change the firm's ownership or liquidate insiders, they differ in the frequency of use and how they accomplish each of the aforementioned objectives (Brau et al. 2003, 1987). Given major similarities and differences between M&A and IPOs, a company needs to consider the individual attributes of each transaction thoroughly as they materially change the structure, strategy and ownership of a company (Frankel 2005, 1).

4.2 Mergers & Acquisitions

Typically, a transaction is considered an acquisition if a company acquires the stock or assets of another entity, typically a smaller one (Coates 2017, 8). The buyer subsequently integrates the target company into its existing operations or keeps it as a stand-alone subsidiary. A merger, on the other hand, constitutes a consolidation of two individual entities, usually of the same size. Therefore, this type of transaction is oftentimes referred to as a merger of equals (Coates 2017, 8). Ultimately, the success and rationale of mergers and acquisitions are dependent on various factors such as business culture, operational structures, transaction costs, market environments and the type of acquirer.

4.3 Strategic buyers

Strategic buyers are oftentimes companies operating in the same industry as the target. The main motive for M&A is vertical integration with a customer or supplier or horizontal integration with a competitor that offers similar services or products (Coates 2017). Strategic buyers aim at achieving operational improvements through synergies, defined as the incremental value of the combined entity that exceeds the value of the two individually operating entities (Seth 1990, 432). Synergies can be classified into cost, revenue and financial synergies. Revenue synergies can be fostered through an extended product portfolio, access to new customers and cross-selling, while cost synergies can emerge from consolidated supply chains, larger bargaining power and the release of economies of scale. Financial synergies can result from carry forward tax losses transferred from the target to shield taxable income of the acquirer or lower cost of capital. Ultimately, accessing strategic resources, such as technology or other intangible assets, can be a motive of acquiring a smaller, more specialized company, especially in industries such as technology, healthcare or financial services (Bansal, de Backer, and Ranade 2018, 3). However, M&A oftentimes come with significant costs during the attempt to integrate the target firm. Throughout the deal, direct costs in form of advisory and legal fees and post-merger integration costs occur. In addition, indirect costs, e.g., loss of experienced staff or time spent on the post-merger integration instead of the core business, are difficult to estimate and quantify, yet playing a crucial role in defining a successful transaction (Coates 2017). The choice of payment, in stock or cash, can be another source of risk. While, financing the deal partially with stock, the buyer is shifting the payment risk to the target's shareholders, whereas in an all-cash deal, the acquirer bears all of the risk and might end up overpaying (Yan and Li 2009, 71). However, options like Contingent Value Rights are usually embedded for deals in regulated industries to counteract uncertainties and conflict of interest.

4.4 Financial buyers

Financial buyers, primarily private equity firms, acquire the target firm for investment purpose in a buyout. They typically finance the transaction through debt and equity, where they borrow up to 80% from lenders and fund the remaining portion with equity contributed by Limited Partners (LPs). Deals, where the main source of consideration is debt, are defined as leverage buyouts (LBO) (Kaplan and Strömberg 2009, 121). With the significant amounts of debt, private equity investors not only restructure the capital structure of the target firm but also enhances their expected return (Kaplan and Strömberg 2009, 132). While using leverage results in additional tax savings, it increases the risk of default if the firm is unable to serve its debt obligations. However, the source of value creation has changed over the past decades. While in the 1980s and 1990s leverage and multiple expansion where the main means of value creation, Meerkatt et al. (2008, 10) estimate that operational improvements make up more than 50% of the value creation from 2010 onwards. Operational improvements comprise revenue enhancing and cost cutting initiatives that primarily aim at improving the firm's cash flow generation and EBITDA margin (Meerkatt et al. 2008). In addition, private equity investors commonly install a new management and incentivize it with equity stakes to achieve predefined financial results. After the investment period, usually between three to five years, the private equity investor aims to sell the company for a multiple of its initial investment. Typical exit strategies comprise an IPO, the sale to a strategic buyer or the sale to another financial buyer which is referred to as a secondary buyout (Folus and Boutron 2015, 218).

4.5 Initial Public Offerings

IPOs comprises the initial listing of a firm's shares on a stock exchange. Through the IPO a new currency is created for future acquisitions, while the ownership structure changes. Moreover, it comes with the advantages of increased visibility, increased reliability towards customers, suppliers and future investors while an established market value reduces previous

valuation issues. Higher disclosure requirements help reduce information asymmetries. On the other hand, there are direct and indirect costs coming along an IPO such as time spent on shareholder meetings as well as underwriting commissions ranging from 3.5-7% of the total offering, legal expenses as well as accounting and auditing fees (PricewaterhouseCoopers 2021). Besides disclosing internal data publicly, listed firms are exposed to higher pressure regarding the maintenance of established growth rates (Barden et al. 1984).

5 Valuation methods

5.1 Fundamentals of valuations

In general, two approaches are used in theory to value a company: Intrinsic valuation and extrinsic valuation. The intrinsic value captures past, current, and future information related to the company to derive its "true" value and does not reflect external factors affecting the firm. One commonly used method for calculating the intrinsic value is the discounted cash flow method (DCF). However, assets also have extrinsic values assigned to them. These are the values ascribed to the asset at a certain point in time and capture externalities such as the company's public view or reputation and reflect market expectations as well as the investor's sentiment (Rosenbaum et al. 2009, 4).

5.2 Discounted cash flow method

The DCF is an intrinsic valuation method and one of the most commonly used valuation methods. The fundamental logic of the DCF is that the value of an asset is the present value of its future cash flows (Rosenbaum et al. 2009, 109). This approach is one of the most detailed valuation methods used in practice as it requires the analyst to perform a detailed analysis of past financials to arrive at assumptions and judgments about companies' future financial performance.

5.2.1 Unlevered free cash flow projections

The unlevered free cash flow (UFCF), denoted by $UFCF = EBIT * (1 - tax\ rate) + D\&A - \Delta NWC - CAPEX$, refers to the cash flow which is available to all investors and generated by the firm after it has paid off all operating expenses, taxes, as well as capital expenditures (CAPEX), but before paying interest expenses (Rosenbaum et al. 2009). The forecast relies on predictions and assumptions about the companies' future performance, e.g., revenue growth or changes in margins. The UCFF is usually projected to a point in time when the company reaches a "steady state", from which the UFCF steadily growths (Rosenbaum et al. 2009, 111).

5.2.2 Discount rate

As the value in the DCF derives from the present value of future cash flows, an appropriate discount rate for the UFCF needs to be determined. The discount rate should reflect the riskiness of the firm. As debt and equity have different risk premiums and tax benefits, the final discount rate is dependent on the capital structure (Rosenbaum et al. 2009, 111). Therefore, the weighted average cost of capital (WACC), denoted by $WACC = \frac{E}{E+D} * Re + \frac{D}{E+D} * (1 - Tc) * Rd$, is used as discount rate (Rosenbaum et al. 2009, 111).

5.2.3 Terminal value

A terminal value refers to the sum of all generated future cash flows after the projected period. Usually, this value corresponds to the majority of the overall present value of cash flows. The terminal value can be derived by two methods: First, the Gordon Growth Model $TV_n = \frac{UFCF_{n+1} * (1+g)}{(WACC - g)}$ calculates the terminal value for the last year of the projection period and incorporates a constant growth rate for the infinite future. The second approach is the exit multiple method. This method determines the terminal value as a multiple of the company's last projected EBITDA (Rosenbaum et al. 2009, 152).

5.2.4 Present value of cash flows

The aim of the valuation is to derive an enterprise value (EV) for a company. Therefore, the future cash flows, including the terminal value, need to be discounted. All cash flows are discounted at the WACC and the resulting sum of the present values represents the EV:

$EV = \frac{UFCF_1}{(1+WACC)^1} + \frac{UFCF_2}{(1+WACC)^2} + \cdots \frac{UFCF_n}{(1+WACC)^n} + \frac{TV_n}{(1+WACC)^n}$ (Berk and DeMarzo 2017, 323).

5.3 Relative valuation methods

Relative valuation methods comprise the use of comparable company analyses and precedent transactions. The **comparable company analysis** is relatively simple to conduct, as no financial items need to be forecasted. The company's value is directly derived from its competitors (peer group), who should have similar characteristics, e.g., growth rates or risk profiles, as the target company (Donald M. Depamphilis 2020, 289). This type of analysis is designed to reflect the current market environment and results in the extrinsic value of the firm (Rosenbaum et al. 2009, 11). Different peer group multiples serve as a benchmark for the target company. Multiples can be divided into equity and enterprise value multiples, dependent on the financial metric used. Equity multiples are used to calculate the equity value of a firm and require two inputs: First, the market value of equity (e.g. price) and second, the variable to which the market value is scaled (e.g. earnings per share EPS) (Damodaran 2006b, 486). Enterprise value multiples include e.g., EV/EBITDA, EV/EBIT, EV/sales. In general, enterprise value multiples are considered more reliable as they are not affected by the company's capital structure. (Damodaran 2006b, 553). The **precedent transactions valuation** method uses multiples, derived from suitable past transactions, to value a target company (Donald M. Depamphilis 2020, 210). Similar to the comparable company approach, the selection of suitable transactions is crucial. For the sake of comparison, the most recent transactions are perceived most relevant as they took place in a similar market environment compared to recent conditions (Rosenbaum et al. 2009, 71). Furthermore, multiples obtained

from precedent transactions incorporate purchase price premiums paid by acquirers (Donald M. Depamphilis 2020, 210). Therefore, precedent transactions tend to provide the highest multiples across all valuation methods.

6 Bausch + Lomb - DCF Valuation

6.1 Capital structure

Companies have an incentive to finance their assets and operations by a combination of equity and debt. As companies do not pay corporate taxes on interest expenses, a tax shield arises, which can be classified as an asset and additional money available for equity holders (Berk and DeMarzo 2017, 552). Hence, in theory, a company should finance a part of their operations with debt to benefit from a higher tax shield. However, increasing the leverage bears several risks. Debt financing creates an obligation for the firm. If these obligations cannot be met, the company faces bankruptcy (Berk and DeMarzo 2017, 584). Considering benefits and costs of raising debt, a company chooses its optimal capital structure which maximizes the firm value, referred to as the trade-off theory (Berk and DeMarzo 2017, 594). The theory suggests that firms should increase their leverage up to the point where the benefits of the tax-shield outweigh the costs of financial distress. B + L reports low debt levels in 2021 (D/E of 1.9%), as the company is a fully owned subsidiary of Bausch Health. Going forward as a stand-alone company, maintaining the same debt level implies missing out on potential tax-shield benefits. Moreover, the firm's cash flows allow for a higher debt level compared historical levels. As common practice, to estimate the amount of debt the for the future, this work assumes a similar capital structure as the peer group. The average D/EV ratio for 2020 and 2021 is 10.5%, which is in line with the average D/EV level of the peers from 2013 - 2019. Therefore, this work assumes that B + L targets a D/EV ratio of 10.5% from 2022 onwards.

6.2 Cost of equity

The cost of equity (Re) is the required return of equity investors to be compensated for the risk of their investment in the company (Damodaran 2006b, 68). A common approach to estimate the risk-compensated return is the Capital Asset Pricing Model (CAPM), defined by: $Re = Rf + \beta[E(Rm) - Rf]$. The systematic risk of a company is measured by the beta factor and scales the Re (Shannon P. Pratt 2002, 70). The model is based on the premise that equity investors need to be compensated with a premium for taking on systematic risk (Rosenbaum et al. 2009, 127). Nevertheless, the CAPM has some drawbacks when it comes to estimating a private company's cost of equity, which is why a modified CAPM (MCAPM) may be a better alternative for B + L.

6.2.1 Risk-free rate

To calculate the Re based on the CAPM, a risk-free rate needs to be defined. Several criteria need to be met to classify an asset as risk-free. First, the asset must not possess any default risk (Damodaran 2006b, 81). Second, no uncertainty exists about reinvestment rates (Damodaran 2006b, 82). As commonly used in practice, the ten-year US treasury bond is chosen as a proxy for the risk-free rate. As of 31/12/2021, the US treasury bond yields a return of 1.5% (Bloomberg).

6.2.2 Equity risk premium (ERP)

The equity risk premium (ERP) reflects any additional return an investor requires to be compensated for taking additional risk compared to the risk-free rate. As the required premiums vary across investors, the market premium is calculated as the weighted average of all individual equity risk premiums (Damodaran 2006b, 86). The most common approach of capturing the ERP is comparing returns of a representative market portfolio to returns of the risk-free security over a historical time period. This work orientates on ERP calculations of Damodaran (2022). As B + L operates in a broad geographical scope and considering the fact

that equity risk premiums vary from country to country, a weighted average of different country risk premiums is applied, based on B + L's geographical revenue segmentation in 2021. The resulting equity risk premium used in the CAPM calculation is estimated at 4.9%. Please refer to *Appendix 8* for detailed calculations.

6.2.3 Beta

The equity beta of a company reflects two components: The riskiness of the business/industry the firm operates in and its capital structure (Damodaran 2006b, 110). The beta states the covariance between the company's returns and the returns of the overall market (Rosenbaum et al. 2009, 129). The S&P 500 is used as a market proxy. Regressing past company's returns against the historical market performance is the common approach to estimate equity betas. However, private companies usually lack historical performance data. Therefore, this work uses a bottom-up approach that does not require historical data of B + L (Damodaran 2006b, 113). Equity betas of companies operating in the same industry and carrying the same industry risk as B + L are unlevered to remove company-specific risks which arises through differences in capital structures. The average of the peer group's unlevered betas yields the estimated unlevered beta of B + L (Damodaran 2006b, 111). A two-step method is applied to unlevered the equity betas. First, for each company included in the peer group, levered betas, as well as information about the capital structure and the specific tax rate are gathered. Second, equity betas are unlevered to remove risk arises from the capital structure, using the following formula $ß_u = \frac{ß_l}{(1+(1-Tc)*\frac{D}{E})}$.

Six different bottom-up calculations are conducted to derive a range of unlevered betas for B + L (*Appendix 9*). Important to note is that two-year betas and D/E ratios are used to conduct a more robust estimation. As an example, if the beta of 2020 is 0.8 and the beta of 2021 is 0.9, the resulting two-year beta is 0.85. The first approach considers a simple average of all companies' unlevered betas. The second approach unlevers the average levered beta with an

average D/E ratio and tax rate of the peer group. Both the third and fourth approach provide market-weighted average beta calculations based on the EV of each company included in the peer group. However, by using the weighted average, the betas of the largest companies, which are perceived as less risky, gain more weight in the calculation and therefore provide lower beta calculation compared to the other approaches. The difference between approach three and four is that approach four uses weighted D/E ratios and tax rates to unlever the beta. The approaches five and six are weighted average betas based on the B + L's business segments. The peer group is separated into two sub-groups: Companies operating in the eye care and ophthalmic pharmaceutical industry and companies operating in the surgical equipment manufacturing industry. Betas of each sub-group are calculated and weighted based on the revenue generated in 2021. All six approaches result in betas ranging from 0.67 to 0.79. The base scenario of the valuation uses approach five, the segment-weighted unlevered beta (0.79). The unlevered beta captures the systematic risk B + L operates in. To incorporate B + L's financing risk, the unlevered beta needs to be relevered to derive an equity beta. The formula to relever the beta and to incorporate the target D/E strategy of B + L is $ß_{e} = \beta_u * (1 + (1 - Tc) * \frac{D}{E}$. The resulting equity beta for is 0.86.

6.2.4 Illiquidity premium

The equity beta calculated in the previous chapter is based on public companies, which are perceived to be less risky than private companies. For private companies, other risk factors, which are not captured by the beta factor, impact the valuation (Shannon P. Pratt 2002, 76). Investments in private companies usually suffer from illiquidity since private shares are not tradeable at stock exchanges. An exact illiquidity premium is hard to assign and usually depends on analysts' assumptions (Thurman and Reilly 2021, 26). Amihud and Pedersen (2012, 139) compare excess historical returns of illiquid versus liquid companies and estimate an average

illiquidity premium of 1.1%. Based on these results, a 1.1% illiquidity premium is added to B + L's cost of equity.

6.3 Cost of debt

The cost of debt represents the required rate of return from debt lenders, considering the risk of receiving the payments. It incorporates the default risk as perceived by the lenders – as the default risk increases, lenders charge more for their financing and consequently, the cost of debt increases (Damodaran 2006b, 131). As the cost of debt resembles default risk, the most common approach for measuring the cost of debt is using the credit rating of the company, assigned by rating agencies such as Moody's or Standard & Poor's (Damodaran 2006b, 131). However, as B + L is not a public listed company, no obtainable credit ratings for the company can be observed. Therefore, similar to the equity beta estimation, two-year debt betas of the peers are used to estimate B + L's debt beta (ßd), resulting in a debt beta of 0.06. The two-year debt betas of the peer group are calculated by incorporating interest expenses, debt levels and statutory tax rates, which are gathered from Bloomberg. Applying the CAPM formula $Rd = Rf + \beta d[E(Rm) - Rf]$ results in cost of debt of 1.8%.

6.4 Enterprise value

To derive an enterprise value of Bausch + Lomb, the Unlevered Free Cash Flow each year needs to be discounted by the WACC to the present value as of 31/12/2021. Starting from the EBIT, adjustments for non-cash items such as D&A, as well as adjustments for CAPEX and changes in NWC, are made to derive at the Unlevered Free Cash Flow (UFCF) for 2022 - 2026. Important to mention, for the terminal value calculation, D&A must equal CAPEX in the last year of the forecasted period. If D&A > Capex, then the company's assets will go to zero in the future. However, if D&A < Capex, the company is expanding into infinity. The terminal value of the company is calculated in two ways. The base scenario in this work is the Gordon Growth Model, in which the terminal value is derived by a perpetuity, assuming a long-term growth

rate of 2.0%, which is typically linked to the long-term GDP growth of developed countries. For this approach, the UFCF for 2027 needs to be estimated. Since B + L states that the company expects amortization expenses of $14 mn each year after 2026 (Bausch + Lomb Corporation 2022, F-29), the UFCF in 2027 is adjusted for this amortization. The second approach is applying an exit multiple to the EBITDA in the last projected year. As exit multiple, the median forward-looking EV/EBITDA multiple for 2022 of the broader peer group (12.7x) is used. To calculate a more accurate time value of money, the DCF incorporates the mid-year convention to discount future cash flows. Not using the mid-year convention assumes that all cash flows are generated at the end of the year. However, the mid-year convention is not applicable to the terminal value since the terminal value is collected at the end of the year by definition. Discounting the UFCFs by the WACC (6.3%) and applying the Gordon Growth Model for the terminal value yields an enterprise value of $7,325 mn at 31/12/2021. The terminal value is a crucial component in the DCF, it corresponds to 85.2% of the EV. Applying an exit multiple results in an EV of $7,443 mn. In this scenario, the terminal value proportion of the total EV is 85.4%.

To derive a broader range of EVs, sensitivity analyses for different scenarios are conducted (*Appendix 10*). Also, a What-If scenario is calculated by assuming the peer groups average EBIT-margin for 2013 - 2019 (21.3%) for the forecasted period, which results in an EV of $15,883 mn based on the Gordon Growth Model and $9,609 mn based on the Multiple method. Please refer to *Appendix 10* for a sensitivity analysis of the EBIT-margin and WACC on the EV to observe the effect of the EBIT-margin on the EV.

7 Relative valuation

7.1 Overview

To obtain a broader picture of B + L's enterprise value, additionally to an intrinsic valuation (DCF), a relative valuation, based on a peer group with similar business activity and company characteristics, is conducted. This relative valuation incorporates external effect, e.g., the market sentiment or macroeconomic factors into the firm valuation. Therefore, the enterprise value resulting from this valuation methods differs from the one derived in an intrinsic valuation (Damodaran 2006b, 447). Two different relative valuations are considered: Comparable company analysis and precedent transactions. Past transactions are further segmented into strategic buyer transactions, financial buyer transactions, and precedent IPOs.

7.2 Comparable company analysis

The comparable company analysis (Trading comparables) requires the identification of firms substantially similar to B + L. A suitable comparable firm has similar growth rates, future earnings, and risk factors (Donald M. Depamphilis 2020, p. 209). In the industry analysis, twelve companies that represent B + L's operations and risk factors comprise of the peer group considered in the comparable company analysis. Within this group, companies are further divided into a broad group (consisting of all companies), and a narrow group, which consists of companies operating exclusively in the eye care sector.

Table 1 states valuation multiples for B + L based on both peer groups as of 31/12/2021. First to notice, the weighted average and median multiples for EV/Sales and P/S are almost identical (for both groups), while EV/EBITDA and P/E diverge considerably. Alcon has a large weight in the weighted average in both groups (more than 15%) and an extremely high P/E multiple (114.7x), which skews the weighted average upwards. Overall, comparing the resulting multiples for both peer groups reveals no large deviations, except for the P/E multiple. A

possible explanation is that the narrow group consists of smaller, specialised companies that do not yet generate large profits. As a conclusion, the narrow group (companies focusing on eye care) is valued higher than the broader pharmaceutical group. Important to mention is that P/E and P/S are equity multiples, while EV/EBITDA and EV/Sales are classified as enterprise value multiples. Therefore, to calculate the respective EV based on equity multiples, Net Debt (as of 31/12/2021) needs to be added to the equity value. The implied EVs are stated in *Table 2*.

Table 1: Comparable company analysis

	EV/Sales		EV/EBITDA		P/E		P/S	
	Broad Group	Narrow Group	Broad Group	Narrow Group	Broad Group	Narrow Group	Broad Group	Narrow Group
75th perc.	6.1x	7.9x	23.6x	27.6x	57.9x	64.1x	5.7x	7.9x
Median	5.2x	5.6x	18.2x	22.9x	40.1x	56.2x	4.6x	5.2x
Average*	5.0x	5.7x	14.9x	22.8x	23.7x	63.8x	4.7x	5.5x
25th perc.	4.1x	3.8x	14.3x	19.1x	21.1x	41.5x	4.0x	3.5x

*Weighted average of peer group

Table 2: Implied Enterprise Values ($mn) - Trading Comparable

	EV/Sales		EV/EBITDA		P/E		P/S	
	Broad Group	Narrow Group	Broad Group	Narrow Group	Broad Group	Narrow Group	Broad Group	Narrow Group
75th perc.	22,697	29,437	17,569	20,520	11,105	12,303	21,121	29,622
Median	**19,350**	**20,799**	**13,561**	**17,017**	**7,672**	**10,790**	**17,281**	**19,439**
Average*	**18,658**	**21,408**	**11,106**	**16,927**	**4,507**	**12,245**	**17,472**	**20,348**
25th pecr.	15,327	14,236	10,604	14,220	4,005	7,944	14,821	13,027

*Weighted average of peer group

Based on the enterprise value multiples of the broad group, B + L's fair EV lies between $13,561 mn and $19,350 mn. The EV based on equity multiples of the broad group (adjusted for Net Debt in 2021) is between $7,672 mn and $17,281 mn. B + L's EVs based on the narrow group lies between $17,017 mn and $20,799 mn (based on enterprise value multiples) and between $10,790 mn and $19,439 mn when using equity multiples. A possible explanation for these high EVs compared to other valuation methods can be the incorporation of the overall market sentiment.

7.3 Precedent transactions

For precedent transactions, the company value is derived from purchase prices of recently acquired comparable companies (Donald M. Depamphilis 2020,210). As previously mentioned, the resulting multiples include purchase price premiums for e.g., synergies or control premiums, paid by the acquirer. Therefore, precedent transaction multiples tend to be higher than multiples from comparable companies (Donald M. Depamphilis 2020, 210). Three different types of precedent transactions are analysed: M&A transactions by strategic buyers, M&A transactions by financial buyers and past IPOs. The rationale behind the split by transaction type is to analyse which type of transactions yields the highest valuation for B + L. While strategic buyers can take advantage of potential synergies when acquiring a target and anticipate these synergies in the purchase price, financial buyers tend to pay a lower price according to their investment case. Synergies generally refer to e.g., cost savings, growth opportunities or new market entries. Therefore, strategic transactions are expected to have the highest valuation multiples across the three transaction types, while IPOs tend to have the lowest valuation due to a potential IPO discount to attract more investors (Hauser et al. 2006, 331).

The search for identifying suitable transactions is conducted as follows: First, only transactions with targets operating in the sectors of healthcare equipment, medical equipment, and pharmaceutical products are considered. Second, only transactions in Europe and North America are selected. The third restriction is related to the target size. Only companies with EVs above $50 mn one day prior to the announcement date are included. Furthermore, the time period is restricted to 2017 - 2021 to reflect recent market conditions. Also, the analysis only includes completed transactions. Most identified transactions involve private companies. Due to disclosure restrictions and competition, acquirers sometimes only publish deal information

that is legally required (Rosenbaum et al. 2009, 72). Hence, only EV/Sales and EV/EBITDA are obtained and considered for determining B + L's EV.

Table 3 summarizes the resulting multiples for all three transaction types. Fifteen **precedent strategic M&A transactions** are obtained, with a median EV/EBITDA multiple of 11.8x and a median EV/Sales multiple of 3.2x. The second set of transactions is comprising **precedent financial M&A deals**. Six comparable transactions result from the search, a median EV/EBITDA multiple of 11.6x and a median EV/Sales multiple of 2.9x. For **precedent IPOs**, seven suitable transactions are identified, with a median EV/EBITDA multiple of 8.4x and a median EV/Sales multiple of 2.4x.

Table 3: Precedent transaction multiples

	Strategic M&A		Financial M&A		IPOs	
	EV/EBITDA	EV/Sales	EV/EBITDA	EV/Sales	EV/EBITDA	EV/Sales
75th perc.	12.3x	5.2x	13.3x	3.6x	10.1x	3.5x
Median	**11.8x**	**3.2x**	**11.6x**	**2.9x**	**8.4x**	**2.4x**
25th perc.	8.8x	1.7x	9.4x	2.5x	5.9x	2.0x

Overall, supporting the literature that strategic transaction should have the highest valuation due to anticipated synergies included in the purchase price, strategic M&A transactions have higher enterprise value multiples than financial M&A transactions and IPOs. However, the difference between the median multiples of strategic and financial transactions is surprisingly low. Also, confirming the theory, IPO valuation multiples are the lowest across different transaction types. Subsequently, the financial metrics are multiplied with the respective multiples to derive a range of implied enterprise values for B + L (as of 31/12/2021), which are stated in *Table 4*.

Table 4: Implied Enterprise Values ($mn) – Precedent Transactions

	Strategic M&A		Financial M&A		IPOs	
	EV/EBITDA	EV/Sales	EV/EBITDA	EV/Sales	EV/EBITDA	EV/Sales
75th perc.	9,141	19,246	9,929	13,621	7,506	13,095
Median	**8,749**	**11,921**	**8,627**	**10,856**	**6,241**	**8,878**
25th perc.	6,578	6,302	6,962	9,324	4,360	7,478

Based on precedent transactions and the medians of *Table 4*, a strategic buyer would pay between $8,749 mn and $11,921 mn for B+ L, incorporating the value of anticipated synergies. However, due to the higher risk of private firms (e.g., through less financial disclosure), a strategic buyer would likely pay a purchase price closer to $8,749 mn. Similar conclusions can be drawn for financial buyers, for which the range of the purchase price ranges from $8,627 mn to $10,856 mn, based on the median multiples. The implied enterprise value based on precedent IPOs ranges from $6,241 mn to $8,878 mn.

8 Exit options

8.1 Financial buyer scenario

Chapter 8.1 conducts B + L's valuation from a financial buyer's perspective, with a resulting equity value of $13,244 mn. The following part analyses three suitable private equity firms regarding a possible buyout of Bausch + Lomb, looking at specific characteristics such as deal size and portfolio fit. The most likely acquirer of B + L are PAI Partners, EQT and Partners Group.

An alternative scenario for Bausch + Lomb is a buyout led by a single private equity firm or a consortium of private equity firms. The following chapter discusses this specific case and further evaluates on the operational changes and transaction structure necessary to achieve desired returns and be considered as a possible candidate for a buyout scenario. Based on the

equity value of B + L resulted from the WACC calculation using the perpetual growth, the resulting deal value is $7,387 mn. Oftentimes buyouts occur in a highly levered form as investors try to boost their returns through the majority of the deal being financed by borrowed capital. However, studies have shown that the share of leverage as a source of value creation for investors has decreased form 51.0% in the 1980s to 25.0% since 2008 (Meerkatt et al. 2008, 10). Hence, a debt portion of 40.0% of the enterprise value, corresponding to $2,930 mn, was assumed to partially finance the deal, which is in line with the findings of Brown et. al. (2021, 55) that show that since 2015 the majority of transactions across all industries were financed with a D/V ratio of between 40.0% to 60.0%. For the cost of debt, a premium to B + L's cost of debt is applied, resulting in 5.0%, based on the findings of Badertscher et al. (2015) that show the cost of debt for firms held by private equity investors exceeds those of publicly-held ones as due to higher default rates among private firms. Furthermore, a constant debt repayment rate of $250 mn is assumed which can be covered by the unlevered free cash flow of the firm assuming conservative operational improvements achievements. With operational improvements accounting for more than 50.0% as a source of value creation, financial buyers are increasingly engaged as an operating partner and actively monitor and change the firm's product offering, cost structure and capital expenditures in order to enhance margins and productivity. Sources of value creation comprising cost and revenue enhancing initiatives such as digitization of administrative processes, system integration, procurement improvement, reducing overhead, boosting advertising and promotion of existing products, diversifying distribution channels, working capital management (improvement of cash conversion cycle), as well as industry specific initiatives such as outsourcing of research & development through cooperation with universities for instance (Matthews, Bye, and Howland 2009, 24). Furthermore, a management fee of 1.2% of the respective EBITDA is assumed to be distributed during the second and the last year of the holding period as monitoring fees corresponding to

median monitoring fee for deals larger than $1,000 mn between 2009 and 2010 (Preqin 2011, 9). After a holding period of five years, Bausch + Lomb would be divested in T-5, where the company achieved operational improvements resulting in an additional EBITDA of $482 mn. Meerkatt et al. (2008, 10) found that multiple expansion accounts for less than 30.0% of the value creation, hence, a conservative scenario is assumed without any multiple expansion. Hence, the forward looking 2022 EV/EBITDA multiple of 12.7x was assumed (Meerkatt et al. 2008, 10). This yields an EV in 2026 of $14,924 mn with a remaining debt value of $1,680 mn, resulting in an equity value of $13,244 mn. Ultimately, the private equity investor would generate a money on invested capital (MOIC) of 1.79x with an IRR of 12.4%, displaying a lower IRR level as reported for healthcare private equity deals from 2010 through 2021 (Murray et al. 2022, 21).

8.2 Financial buyer review

PAI Partners is a French-based private equity firm and was originally a part of the principal investment arm of Paribas. Since its origin, the Firm raised over €24.0 bn through 7 fund heritages, leading to total assets under management (AuM) of €25.4 bn. For its latest fund, the firm raised €5.1 bn. PAI invested in buyouts with a combined value of over EUR 70.0 bn. The investment firm has a dedicated healthcare focus in which it adds value through capacity expansion, supply chains consolidation and service or product improvements. In particular, PAI focuses on healthcare segments in which its portfolio companies can contribute to improved products and services that lead to prevention over treatment. The investment focus is on majority stakes in medium- and large industry leaders. B + L fits in these investment criteria and could be a potential target of PAI Partners. As of 31/12/2021, the company holds four healthcare companies in its portfolio, operating in different segments such as ophthalmology clinics or surgical technology.

EQT is a Swedish-based private equity firm. EQT and was founded in 1994. The company invests with its EQT Private Equity business line in healthcare companies (among others) with an equity ticker up to €1.5 bn. As of 31/12/2021, the company has raised more than €100.0 bn, with the American investors being the largest client base for raising capital (29.7%). The company has around €77.0 bn ($131.0 bn) AuM and 36 active funds. 14 healthcare companies comprise EQT's strong presents in the healthcare industry and B + L could profit from EQT's strong industry experience and resources. The EQT IX fund, with an overall fund size of €15.6 bn includes six healthcare companies, indicating EQT's focus and interest in this industry. However, given a maximum equity ticker of €1.5 bn and B + L's estimated equity value of $7,387 mn, a conglomerate buy with other financial buyers is the most likely scenario.

Partners Group is based in Switzerland and invests in private markets globally since 1996. The investment firm has $131 bn AuM, of which $66.0 bn are invested in private equity. Furthermore, most of the AuMs are located in North America (19.0%). One of the major investment areas of the company is Health & Life, which includes eight healthcare companies. In 2019, Partners Group acquired EyeCare Partners, a medical vision service provider who operates in medical optometry, ophthalmology, and vision correction products. Due to the company's size, investment criteria and previous acquisitions, an acquisition of B + L fits in the overall strategy and portfolio.

8.3 Initial Public Offering scenario

To maximize the advantages of an IPO while lowering the risks and expenses associated with it, choosing the right stock exchange is crucial. In this context, factors such as listing fees, location, currency, liquidity, accounting requirements, and past sector performance differ among stock exchanges and therefore need to be carefully scrutinized. Selecting the wrong exchange can hamper the firm's performance and public reputation (Ernst & Young Global

Limited 2019, 3). First, a firm might need to comply with specific financial reporting standards such as US GAAP (Generally Accepted Accounting Principles) or IFRS (International Financial Reporting Standards) (PricewaterhouseCoopers 2015, 3). Secondly, listing costs, i.e., floatation costs (FTC), are one of the most apparent differences between stock exchanges and relate to listing costs, IPO fees, annual fees, and commissions. Thirdly, past performances, beneficial market valuations and recent listings of comparable companies might favor one stock exchange for a specific industry segment (PricewaterhouseCoopers 2015, 3). Lastly, historical IPO performance indicates investors' demand for newly issued shares, while providing insights about past IPO discounts (PricewaterhouseCoopers 2015, 3). Besides these generic factors, Brau et al. (2006) found that creating a future acquisition currency ranks as the most important motive for CFOs to conduct an IPO. Since B + L plans to further expand its product portfolio and grow its addressable market through acquisitions and partnerships, two stock exchanges are considered most suitable for B + L.

8.4 Stock exchange review

The **New York Stock Exchange (NYSE)** is the most prestigious in the world. It is also the largest stock exchange globally, with over $25.0 tn market cap as of December 2021 (World Federation of Exchanges 2022). If B + L lists on the NYSE, it would significantly enhance its credibility and overall popularity amongst investors and customers. This could enable B + L to capture further market share in the US and substantially increase the company's performance, as the US represents B + L's largest market, with over 43.0% of total operations (Bausch + Lomb Corporation 2022, 306). With 108 IPO listings in 2021 that raised $58.2 bn in IPO proceeds, the NYSE shows a 151% year-on-year growth (Ernst & Young Global Limited 2021, 12). It is notable that US stock markets in 2021 represented the biggest market for healthcare IPOs with 162 listings and $29.9 bn raised (Ernst & Young Global Limited 2021, 12).

The **Toronto Stock Exchange (TSX)** is Canada's biggest public equities exchange. In 2021 the exchange had 3,400 companies listed over the TSX and TSXV (TSX Venture Exchange) exchange. Despite the high number of listed companies, this stock exchange is proportionally smaller compared to NYSE, with around $2.8 tn in market cap. TSX could be attractive for B + L as it is a Canadian company with headquarters in Ontario. Being a local company could help attract local investors' appetite and, in this way, increase market capitalization. Nevertheless, TSX trading volume is only around 7.0% of the trading volume monitored on NYSE, which means listing in Canada would limit the exposure to investors' capital inflows (Statista 2022, 12). The downside of TSX, therefore, comes mainly from the size of the exchange itself. On top of the smaller trading volume, it also listed 47 IPOs in 2021 with overall proceeds of $5.9 bn, which is considerably less compared to NYSE (Ernst & Young Global Limited 2021b, p11). Please refer to *Appendix 21* for a summary overview of the stock exchange characteristics.

If pursuing an IPO, listing on the New York Stock Exchange is the most suitable option for B + L's IPO. Even though the company is based in Canada, listing in the US brings many advantages such as currency, trading volume and market reputation for the healthcare sector in particular. At the same time, listing on the NYSE brings much credibility for companies being the largest stock exchange and assures investors about the business's health. Despite most of the competition floating on the NYSE, it is still an attractive exchange considering the amount of volume that flows through the exchange daily, which is why the competition should not affect the company's attractiveness much.

Three adjustments are made to the valuation to derive at an enterprise value of B + L in an IPO scenario. First, an IPO discount of 20.7% is assumed in line with the findings of Hauser et al.

(2006) that show the economic significance of IPO discounts through first-day returns. As underwriters are responsible for selling the IPO shares, they price them attractively for the clients they are selling. Therefore, underpricing of the IPO creates a discount for initial investors, and increases demand for the company stock (SEC - Office of Investor Education and Advocacy 2022, 4). Secondly, underwriting commissions estimated by PricewaterhouseCoopers for companies valued above $1.0 bn of 3.5% of the equity value are incurred (PricewaterhouseCoopers 2022). Lastly, the IPO valuation accounts for one-time floating costs through the average FTC of the two stock exchanges resulting in $206,370. It is important to note, that the model does not incorporate annual fees. Ultimately, accounting for all mentioned costs, yields a B + L equity value of $5,688 mn and $5,646 mn applying the terminal value multiple or Gordon growth approach, respectively.

9 Conclusion

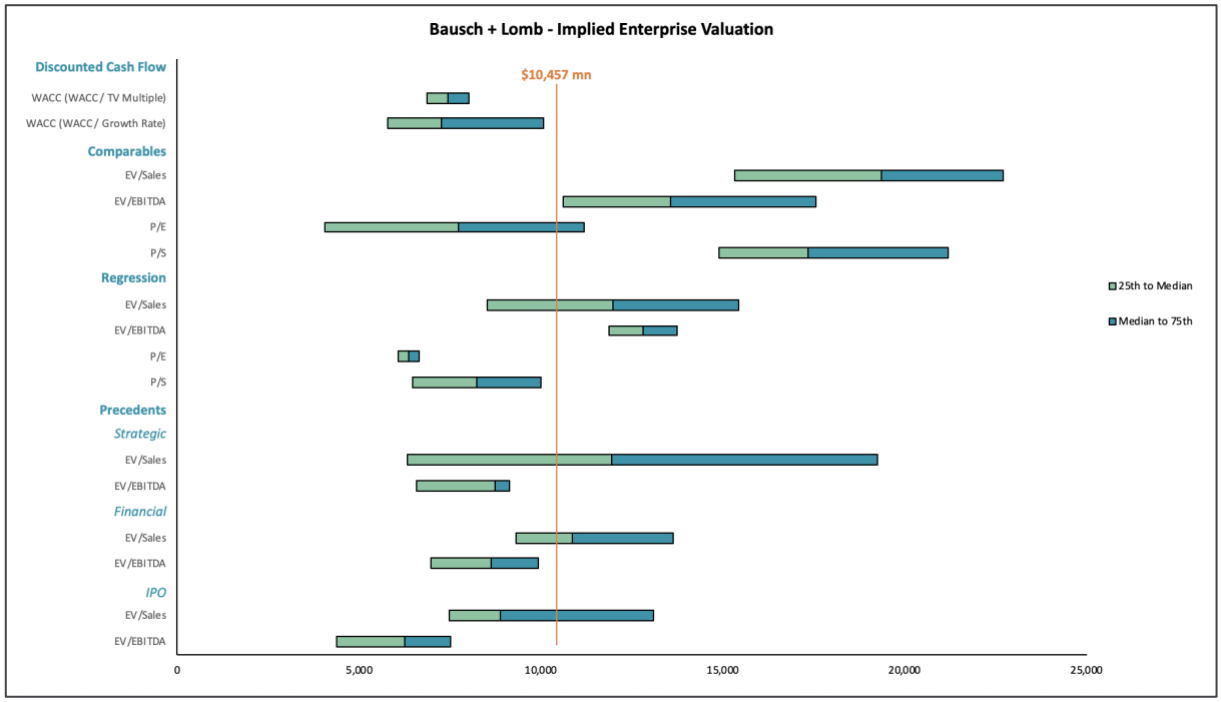
The aim of this work is to conduct a comprehensive valuation of Bausch + Lomb as of 31/12/2021 and exploit future exit options for the company. *Table 5* summarises ranges of enterprise values estimated through various valuation methods (excluding enterprise value adjustments for exit options). The average enterprise value for Bausch + Lomb as a stand-alone entity is $10,457 mn across all valuation methods.

This work assumes that the companies in the eye care industry share similar characteristics, growth, as well as risk factors. Following the lack of historical financials reported from Bausch + Lomb as a separate entity, this work assumes the company to operate in a similar manner as its competitors. Therefore, Bausch + Lomb's financial forecast is adjusted based on the analysis of competitors' historical performance. Including these adjustments, Bausch + Lomb's future operations are expected to move more in line with that of its established public competitors.

The estimation based on a multiple regression yields an enterprise value for Bausch + Lomb ranging from $6,905 mn to $12,807 mn. This estimation is based on Bausch + Lomb's financials as of 31/12/2020. Furthermore, this work exploits exit options comprising an acquisition by a strategic and financial buyer, as well as an IPO.

Assuming a historical premium paid by selected competitors of 27.6%, operational synergies with a present value of $2,039 mn are derived and yield an enterprise value for Bausch + Lomb of $9,427 mn, using the Gordon Growth Model. In addition, the financial buyer case assumes certain private equity-led initiatives that lead to an enterprise value at the end of the acquirer's holding period (2026) of $14,924 mn, yielding a money on invested capital (MOIC) of 1.79x and a corresponding IRR of 12.4%. Assuming the case of an initial public offering of Bausch + Lomb, the model derives at an equity value of $5,646 mn, after accounting for specific costs and factors typical for an initial stock listing. The above-mentioned results provide detailed information about the firm's enterprise value following common valuation approaches. Furthermore, this work provides the owners of the firm with a framework to showcase differences in the firm value based on each exit option.

Table 5: Summary of Implied Enterprise Value for Bausch + Lomb as of 31/12/2021 (own visualisation)



10 Regression (Individual part)

10.1 Regression overview

This work aims to perform a fair valuation of Bausch + Lomb (B + L) and exploit exit options in the near future. To conduct a proper valuation, it is crucial to examine which variables influence the company value and to what extent and which valuation multiples are suitable for the specific industry. By conducting a multiple regression analysis, the influence of an independent variable, e.g., eps growth, on a dependent variable, e.g., the Price-to earnings multiple (P/E), can be statistically shown and quantified. In the following chapter, a two-step regression model is conducted: The first regression type (TYPE I) uses value drivers such as sales and earnings as independent variables and regresses these on, e.g., the company's share price, to evaluate their accuracy for valuation purposes. The aim of TYPE I regressions is to identify accurate multiples for the healthcare industry, which in the next step are used for the relative valuation of B + L. The second regression type (TYPE II) aims to identify key value

drivers of specific multiples for the healthcare industry to understand industry characteristics better and conduct an overall more accurate valuation. Furthermore, valuation multiples for B + L are estimated based on TYPE II regressions using firm-specific company figures from 2020. This estimation is an addition to the comparable firm approach since it uses statistical methods and a larger number of peers. Generally, a broader overall valuation is obtained, and statistical statements can be made about industry factors and value drivers.

10.2 Related literature

The two types of regressions were discussed in several academic studies. Liu et al. (2002, 142–143) construct a multiple regression to explain stock prices by different fundamental value drivers, such as earnings and sales. The authors modify these value drivers to inverted multiples by dividing them by the respective share price to minimize the square of pricing errors and conclude that earnings explain share prices best, followed by the book value of equity and sales (Liu et al. 2002, 163). Whitbeck and Kisor (1963, 58) construct a regression model to explain and quantify the relationship between the normalized P/E and key value drivers such as earnings growth rate, the standard deviation of earnings and the dividend payout ratio. As expected, the growth rate and the dividend payout ratio both have positive coefficients in the regression. In contrast, the standard deviation has a negative coefficient, indicating that additional risk lowers the P/E multiple. Wilcox (1984, 65) uses a regression model to quantify the relationship between the Price-to-book multiple (P/B) and return on equity (ROE) and concludes that a higher ROE leads to a higher P/B multiple. Zarowin (1990, 453) regresses earnings growth and systematic risk on inversed P/E multiples and concludes that earnings growth is a significant value driver, however, systematic risk is not a suitable regressor for predicting P/E multiples. Damodaran (2002) analyses the impact of multiple value drivers on different multiples, such as P/E or EV/EBITDA. The author concludes that possible limitations of the regressions are a changing relationship between multiples and value drivers over time and multicollinearity

across the independent variables, which results in unreliable coefficients (Damodaran 2002, 38). Agnes Cheng and McNamara (2000, 367) regress P/E multiples, P/B multiples and a combination of these multiples on the share price. The authors conclude that a combination of both multiples lead to the highest accuracy, followed by the P/E ratio and the P/B ratio.

10.3 Derivation of key value drivers

The TYPE I regressions analyse the effects of earnings and sales on share prices, as well as the effects of EBITDA and sales on the enterprise values (EV). Musumeci and Peterson (2011, 1286) argue that using inverted multiples in regressions leads to a more precise regression. The following derivation is based on Baker and Ruback (1999, 6–7) and Liu et al. (2002, 142–144), and transforms value drivers into inverted multiples. The initial equation is stated as follows:

$$Share\ Price_i = \alpha_i + \beta_1 * earnings_i + \beta_2 * sales_i + \varepsilon_i \quad (1)$$

Dividing the right-hand side of the equation by the share price results in

$$1 = \alpha_i * \frac{1}{Share\ Price_i} + \beta_1 * \frac{earnings}{Share\ Price_i} + \beta_2 * \frac{sales}{Share\ Price_i} + \frac{\varepsilon_i}{Share\ Price_i}. \quad (2)$$

Dividing value drivers by the share price results in a proportional valuation error to the respective share price. From (2), inverted multiples of P/E & P/S and a proportional constant are obtained. Similar derivations apply to the regression of EBITDA and sales as value drivers on the enterprise value. However, the EV also depends on the company's capital structure. Hence, regression results might be misinterpreted since the capital structure is not considered. For TYPE II regressions, all significant multiples from TYPE I regressions are analysed for their value drivers. The TYPE II regressions orientate on the work of Damodaran (2007, 763)**.** Value drivers can be identified by breaking up the specific multiple equation. The derived formulas are stated in *Appendix 20*. The following key value drivers are derived from the equations: P/E: eps growth, beta, dividend payout ratio; P/S: eps growth, beta, dividend payout ratio, profit margin; EV/EBITDA: eps growth, beta, reinvestment rate, return on invested

capital, effective tax rate; EV/Sales: eps growth, beta, reinvestment rate, operating margin. The P/B ratio is not included in the regressions since the healthcare industry is driven by intangible assets such as patents, goodwill, or brands, which might not be valued correctly with their book value. Hence, the P/B multiple would mitigate the importance of intangibles and therefore would be not representative for the industry B + L operates in.

10.4 Research design & data

The data used for all the regressions is extracted from Bloomberg and covers the period 2016-2021. All regressions use the same raw data set. To incorporate company data from different countries, the following search on Bloomberg is performed: Using the EQS command, only data for actively traded companies is selected and only the primary ticker of each security. The search filters for the whole healthcare industry, not only the eye care industry, to observe a more extensive data set. Finally, only companies with a market capitalization larger than or equal to $100 mn. USD, EUR, or CHF are considered. The currency exchange ratios are around one (USD/EUR: 0.880, USD/CHF: 0.913 as of 31/12/2021). Hence, the companies all have a minimum market capitalization of around $100 mn. This search results in 806 companies. Additionally, four comparable companies of B + L (Santen Pharmaceutical CO LTD, Hoya Corporation, Pegavision Corporation and Menicon Co LTD), which denote their financial data in other currencies, are added to the data set. In total, the data sample includes 810 companies. Overall, 4050 data tuples are observed for 2016 - 2021. For TYPE I regressions, the following data is gathered: share price, enterprise value, P/E, P/S, EV/EBITDA, and EV/Sales. For TYPE II regressions, the following data is extracted: eps growth, beta (1-year, daily observations), dividend payout ratio, return on invested capital, operating margin, profit margin, effective tax rate and reinvestment rate (denoted as 1 - dividend payout ratio). Due to significant deviations in eps growth each year, a five-year earnings compound annual growth rate (CAGR) is used as a growth indicator. The process of preparing the data is similar in each regression. All data

tuples that miss one value for at least one required variable in the specific regressions are excluded from the raw data set. Consequently, the sample size differs across the regressions. Finally, to control for extreme values and outliers, all the variables from regression III-VII are winsorized at a 10% level.

10.5 Characteristics of a multiple regression model

The standard multiple regression model is stated as follows:

$$y_i = \alpha_i + b_1 x_{i1} + b_2 x_{i2} + \ldots + b_p x_{ip} + \varepsilon_i \quad (3)$$

for $i = n$ observations. This regression aims to make a statement about the effect of the explanatory variable xip on the dependent variable yi. The multiple regression model is also known as a ceteris paribus analysis as it quantifies the effect of many independent variables on the dependent variable while keeping other factors constant (Wooldridge 2015, 60). This characteristic is suitable for analysing the effects of value drivers of multiples in a regression independently. A multiple regression method has various advantages over a common relative valuation approach. First, no companies are identical in their operations or risk, which makes it difficult to identify a suitable peer group (Damodaran 2007, 758). The peer group of a common relative valuation is usually relatively small compared to the peer group in a regression. Therefore, selecting the wrong peers has a significant impact on the valuation. Furthermore, a common multiple, such as P/E, assumes linearity, which does not need to hold. Multiple regression can incorporate non-linearity by using, e.g., the logarithm of a variable (Damodaran 2007, 762). Important to note is that because of the quality of data and potential multicollinearity between independent variables, results from the regressions need to be examined with caution, even if the coefficients of the variables are significant. To conduct reliable regressions, statements and assumptions regarding heteroskedasticity of the error terms and multicollinearity need to be made. When analyzing the residuals of our regressions, heteroskedasticity is observed. Heteroskedasticity implies that the variance of the residuals is

not constant for all data points (Wooldridge 2015, 82). Please refer to *Appendix 19* for an example scatter plot. Therefore, robust standard errors are used. If not incorporating heteroskedasticity, the t-statistic of the variables becomes faulty (Wooldridge 2015, 244). Since the variance in a heteroskedastic case is usually higher than in a homoscedastic scenario, standard errors increase, which reduces the t-statistic and lowers the probability of significance of p-values. Heteroskedastic standard errors are always valid in large samples, even in the case of homoskedasticity (Wooldridge 2015, 244). The regressions could suffer from multicollinearity, since from an academical point of view, variables such as risk and earnings should be somehow related. Therefore, the correlation between the regression's independent variables is analyzed to avoid potentially misinterpreting the results. If a regression suffers from multicollinearity, statements about ceteris paribus effects may not hold.

The data set used is structured as panel data. Panel data sets consist of cross-sectional data observed over multiple periods (Wooldridge 2015, 9). An advantage of working with panel data is observing dynamic effects and relationships between different variables (Bond 2002, 141). Also, working with panel data allows to incorporate fixed effects into the regression model. Fixed effects are unobserved effects factors that apply to a group of data tuples, e.g., an effect in one specific year or an event occurring in a specific industry. Two methods are common in academic research to incorporate these effects: A fixed effect estimation and a dummy variable regression. The fixed effect estimation transforms the variables by de-meaning them, hence removing the unobserved term, which is fixed over time (Wooldridge 2015, 435). However, this work uses the dummy variable regression. For a specific unobserved effect, a dummy variable is created. The regression uses dummy variables for each year (2017 - 2021), with 2020 as a base year. Using dummy variables for specific years allows to observe differences between years. Choosing 2020 as a base year allows to identify differences in valuation

multiples during the COVID-19 pandemic compared to prior years and 2021. Another dummy variable, dNorthamerica, is included, with non-North America as a base scenario. This variable measures the impact of the location of the companies on valuation multiples. The two groups are North America and the rest of the data sample. Since B + L is based in North America and would probably be listed there, it is interesting to observe whether valuation multiples differ across locations. The dummy variable regression is identical to the fixed effect estimator but more intuitive since it allows for multiple intercepts. However, since including dummy variables explains more variation, the R-squared will be higher than for the fixed effect estimator and might be overestimated (Wooldridge 2015, 438). Another crucial point when working with panel data is data lagging. Lagging the independent variables allows predicting multiples by using historical information. Hence, value drivers from 2020 are used to predict multiples in 2021. Therefore, the standard regression model (3) is modified, according to (Wooldridge 2015, 314). As an example, the P/E multiple in the regression is predicted by

$$P/E_{2021} = constant + ß_1 * EPS\_Growth_{2020} + ß_2 * Beta_{2020} + ß_3 * Dvd\ P/O_{2020} \quad (4)$$

The model would not have a predicting power if (3) is used in the regressions, and multiples for Bausch + Lomb (as of 31/12/2021) would not be predicted correctly. Due to a large number of observations, the deviation between the minimum and maximum values for variables is extreme. The range of, e.g., P/E multiples in regression III is 0.870x - 671.316x, as stated in *Appendix 15*. A possible explanation is that the distribution includes outliers. There are several ways to deal with these outliers. However, each method has its advantages and disadvantages. The outliers can be kept, winsorized or excluded in the data set. The last two methods might underestimate the outliers. Hence, the regression estimates will be biased. However, if outliers are not removed, they might skew the whole regression and coefficients could differ from the actual population mean (Ghosh and Vogt 2012, 3455). This work winsorizes each variable at a

10% level to adjust the data set for outliers. When winsorizing, e.g., the range of P/E multiples reduces to 12.998x - 65.231x. For all summary statistics, please refer to *Appendix 14*.

10.6 Hypotheses

Each regression is conducted because some correlation or explanatory power of the independent variable on the dependent variable is expected. This work states the following hypotheses:

H1: The beta is significant in each regression with a negative coefficient

H2: Earnings growth is significant and positive throughout the regressions

H3: Multicollinearity is observed across all regressions

H4: All inverted multiples from TYPE I are significant with a positive coefficient

H5: Both profit-and operating margins are significant with a large, positive coefficient since more profitable companies should be valued higher than less profitable companies

H6: The coefficient of dNorthamerica is positive and significant. Therefore, companies listed on North American stock exchanges have higher valuations than companies listed elsewhere

H7: Multiples for 2017 - 2019 and 2021 are higher than for 2020 due to the COVID-19 pandemic

10.7 Results and interpretation

This chapter interprets the regression results regarding the statistical significance of coefficients and estimates valuation multiples and EVs for B + L. Additionally, *Appendices 18 & 20* state the correlation coefficients and summary statistics for each regression. As a general remark, a significant constant can be interpreted as a variable that might be omitted in the regression and influence the dependent variable (Liu et al. 2002, 144). However, interpreting the constant might only sometimes be meaningful. Also, the F-test, which examines the overall significance of the regression, is analysed. The F-test is a joint test of the overall regression model. Its null hypothesis states that all coefficients of the independent variables are equal to zero, thus having

no explanatory power on the dependent variable (Woolridge 2015, 135): $H_0 = \beta_1 = \beta_2 = \ldots = \beta_k = 0$. Overall, all regressions have a significant p-value for the F-statistic, indicating that each regression shows at least some explanatory power. Also, confirming **H3**, multicollinearity between the independent variables is observed in each regression, as stated in the correlation matrix in *Appendix 16*. Hence, statements about ceteris paribus effects are hard to maintain.

The regression results for TYPE I regressions are stated in *Appendix 12*. Regression I covers 1,296 observations, and regression II 1,402. First to notice, I and II have a high explanatory power, observed by a higher R-squared (I: 0.728, II: 0.697). In I, the coefficient of the constant is significant, indicating that including additional independent variables might lead to more accurate regression. The regression coefficients would be biased when omitting the constant since they would capture the effect of the omitted variables on the share price. In I, both inverted multiples are highly significant. Earnings are the most important value driver in I since earnings per share price (E/P) has the largest coefficient (2.418). Positive coefficients for E/P and sales per share price (S/P) indicate that higher earnings and sales increase the share price. However, the variables E/P and S/P suffer from multicollinearity (0.309). The correlation between Sales/EV and EBITDA/EV in II is even higher (0.670). This multicollinearity seems intuitive since the item EBITDA is derived from sales. A similar argumentation applies to E/P and S/P. The dummy variable dNorthamerica is significant in I & II, indicating that companies listed on North American stock exchanges have higher share prices and EVs than companies listed on other stock exchanges. These results support **H6.** Regression II's R-squared, as previously mentioned, is relatively high, which indicates a "suitable" model. However, even if insignificant, the constant has the largest coefficient (6.485). Therefore, adding more variables in the regression might help explain variations in enterprise values. The coefficient of EBITDA is positive and significant. Therefore, EBITDA as a value driver has a positive effect on the EV

of a company (1.428). Surprisingly, the coefficient for Sales/EV is insignificant and negative (-0.024), meaning that the number of sales does not impact EVs. Therefore, **H4** is rejected. As already mentioned, this regression result should only be an indication since the EV is highly dependent on the individual capital structure of a firm. Overall, the results from TYPE I regressions are mixed. Alongside the other independent variables, Sales/EV was expected to be significant in explaining EVs. A possible explanation could be the high multicollinearity between the independent variables. Furthermore, sales figures vary across the data set. Comparing the median (0.290) and the average (0.628) of the variable Sales/EV in *Appendix 14* indicates that the median is much lower than the average. Consequently, many companies tend to have low sales, while a smaller group has large sales, which increases the average. Smaller companies do not generate many sales due to, e.g., regulatory requirements, years of testing, various testing stages and a competitive industry. This discrepancy in the number of sales might explain the surprising results.

Table 6: TYPE II Regression Output (own calculation)

	Regression III (P/E)	Regression IV (P/S)	Regression V (EV/EBITDA)	Regression VI (EV/Sales)
Variable	Coefficient			
Constant	**27.032*** (3.766)	**0.617** (0.467)	**13.401*** (2.047)	**0.203** (0.439)
EPS growth	**-6.298** (5.960)	**-0.061** (0.679)	**3.397** (2.883)	**0.050** (0.651)
Beta	**15.061*** (4.110)	**0.987*** (0.513)	**7.451*** (1.977)	**1.780*** (0.483)
Dvd P/O	**-7.067*** (2.313)	**-0.206** (0.256)	-	-
dNorthamerica	**-3.905*** (1.317)	**0.205** (0.167)	**1.176*** (0.658)	**0.224** (0.159)
Profit Margin	-	**21.110*** (0.991)	-	-
ROIC	-	-	**4.004** (5.629)	-
RR	-	-	**0.568** (1.085)	**-0.290** (0.247)
Eff. Tx. Rate	-	-	**-17.999*** (3.254)	
Operating Margin	-	-	-	**16.686*** (0.903)
d17	**-6.968*** (1.802)	**-0.658*** (0.199)	**-1.903*** (0.876)	**-0.924*** (0.196)
d18	**-7.469*** (1.799)	**-0.512*** (0.205)	**-0.626** (0.933)	**-0.718*** (0.198)
d19	**-1.989** (1.882)	**-0.231** (0.213)	**-0.316** (0.944)	**-0.174** (0.204)

d21	**-0.974** (2.055)	**0.247** (0.237)	**0.425** (0.998)	**0.164** (0.236)
R-squared	0.062	0.424	0.113	0.376
N. o. obs.	810	834	702	834
F-test	0.000	0.000	0.000	0.000

*Significant at a 10% level

Table 6 reports the results from the TYPE II regressions. Against the theory, the beta has a positive coefficient across all regressions, indicating that riskier companies have higher multiples. Therefore, **H1** is rejected. However, other literature observed similar results (Damodaran 2002, 35). eps growth is, against **H2,** and the fundamental nature of this driver, not significant in any regression. These results indicate that the growth of a firm (measured by earnings growth) does not impact its valuation. The coefficient for Dvd P/O is negative in III and IV, hence paying higher dividends decreases valuation multiples. However, the coefficient is only significant in III. Looking at the DDM in *Appendix 20* implies a positive coefficient: Discounting larger dividends results in a higher share price than discounting smaller dividends (holding everything else equal). In both V & VI, the reinvestment rate is insignificant and has small coefficients, hence has no explanatory power in these regressions. Comparing the overall explanatory power, P/S (0.424) has the highest R-squared, followed by EV/Sales (0.376). Both regressions have insignificant constants, which can be interpreted as a suitable choice of independent variables. P/E and EV/EBITDA have large and significant constants, indicating that the regressions omit variables which could explain more variation. Both operating margin (16.686) and profit margin (21.110) are significant and have by far the largest coefficients, making margins the key value drivers of their respective multiple, supporting **H5**. An explanation could be that investors prefer margins as an indicator of profitability over the other value drivers used. The regression states mixed results for the dummy variable dNorthamerica. A significant and negative coefficient of -3.905 in III indicates that North American companies are valued on average with lower P/E multiples than other companies (ceteris paribus). As an

example, assuming similar values for beta and Dvd P/O, if Pfizer (based in the US) is valued with a P/E multiple of 15x, Novartis (based in CH) is valued with a P/E multiple of 18.9x, based on equation (5). However, this difference in multiples by geography is not significant in all regressions, hence **H6** is rejected. No significant difference in locations is observed in IV & VI. In V, dNorthamerica is positive (1.176) and significant, implying that North American companies have higher multiples than other companies (ceteris paribus). The coefficient of the effective tax rate in V is significant and strongly negative (-17.999). As expected, a higher tax rate lowers the valuation multiple. However, the magnitude of the coefficient is surprising. The dummy variables d17 – d19 and d21 reveal mixed results. d17 and d18 are overall negative and significant (except d18 in V), implying that valuation multiples were higher in 2020 than in 2017 and 2018, ceteris paribus. However, the coefficients for 2019 and 2021 are not statistically significant. Consequently, valuation multiples in these years were not generally different during COVID-19, ceteris paribus. Hence, **H7** is rejected. A crucial point is that the multiples are observed at the end of each year. Most valuations rose significantly from the significant drop in March 2020 onwards until 31/12/2020. Therefore, an actual "COVID-19 effect" is hard to observe. The coefficients for d21 are insignificant but positive (for three out of four regressions). These results could indicate that valuation multiples are higher in 2021 than in 2020. As previously mentioned, a shortcoming of multiple regression is the possible multicollinearity between the independent variables. As already discussed, multicollinearity is observed across all regressions. Economically, most of the correlations between the independent variables cannot be denied. As an example, earnings growth is correlated with Dvd P/O by construction, and Dvd P/O with beta. Observed in regression III-VI, dNorthamerica is positively correlated with Beta, hence North American-based companies tend to have higher Betas than non-North American-based companies, thus, are riskier. Overall, the results for the second type of regression are mixed. eps growth is insignificant across the regressions,

contradicting related literature. Also, a positive coefficient for beta is not intuitive. Chapter 10.8 discusses possible explanations for these results. However, valuable solutions can be drawn. The financial metrics operating margin and profit margin are the most important value drivers in the healthcare industry. Also, risk, measured as beta, is an important value driver in the valuation of companies.

The regression TYPE I identifies P/E, P/S, and EV/EBITDA as suitable valuation multiples for the healthcare industry, while EV/Sales was (slightly) insignificant in II. However, the collinearity between EBITDA and sales is extremely high (0.670), limiting the interpretation. Since EV/Sales is a common valuation multiple and its insignificance is probably due to limitations of the regression method described earlier, the multiple estimations include this multiple. The TYPE II regressions identify value drivers of these multiples for the healthcare industry and are the fundament for predicting multiples for healthcare companies in this work. Using only significant variables stated in *Table 6* for the multiple estimation results in the following equations of multiple estimations:

III: $PE_t = 27.032 + 15.061 * Beta_{t-1} - 7.067 * Dvd\ P\ /\ O_{t-1} - 3.905 * dNorthamerica$ (5)

IV: $PS_t = 0.987 * Beta_{t-1} + 21.11 * Profit\ Margin_{t-1}$ (6)

V: $EV/EBITDA_t = 13.401 + 7.451 * Beta_{t-1} - 17.999 * Effective\ Tax\ Rate_{t-1} + 1.176 * dNorthamerica$ (7)

VI: $EV/Sales_t = 1.780 * Beta_{t-1} + 16.686 * Operating\ Margin_{t-1}$ (8)

For each regression TYPE II, *Appendix 13* states the median of the value drivers, the average across all regressions (industry average), and the respective numbers for B +L. Since the aim of this model is to estimate valuation multiples for B + L for 31/12/2021, financial numbers from 2020 are used for the estimation. However, B + L had a significant change in provisions

for income tax in 2020 (Bausch + Lomb Corporation 2022, 126), hence the data of 2020 is not representative. Therefore, the income statement is adjusted by the statutory tax rate, as stated in *Appendix 18*. Other value drivers, such as margins, are based on this adjustment. B + L-specific valuation multiples are estimated by multiplying its fundamental metrics from *Appendix 13* with the respective coefficients from equations (5) – (8). The resulting multiples are stated in *Appendix 11*. Furthermore, for each TYPE II regression, the two largest value drivers (identified by the largest & significant coefficients) are used in sensitivity analyses to quantify a range of estimates and analyse the sensitivity of the input parameters. Please refer to *Appendix 17* for the sensitivity analyses. The multiple estimation indicates that the P/E multiple for B + L is above the industry (36.1x vs. 35.2x). All other multiples value B + L lower than the industry, based on B + L's financials in 2020. The EV is derived by multiplying the multiples from *Appendix 11* and B + L's company figures in 2021. *Table 7* states the implied EVs, including an adjustment for the Net Debt ($62 mn in 2021) for equity multiples. Based on B + L's financial numbers in 2020, the range of EVs is between $6,905 mn (P/E) and $12,807 mn (EV/EBITDA). The industry average is a scenario in which B + L has identical numbers for value drivers as the industry over the years. The EV in this scenario ranges from $6,736 mn (P/E) to $14,752 mn (EV/Sales). The large difference between B + L's EV based on the EV/Sales multiple compared to the EV based on the industry ($10,297 mn vs. $14,752 mn) is mainly due to the low operating margin of B + L in 2020.

Table 7: Implied Enterprise Value for Bausch + Lomb as of 31/12/2021 (own calculation)

	P / E	P / S	EV / EBITDA	EV / Sales
Max	7,195	11,753	14,968	18,864
75th Percentile	6,650	9,991	13,735	15,414
Median	**6,359**	**8,228**	**12,807**	**11,963**
Industry Average*	**6,736**	**10,974**	**13,185**	**14,752**
B + L 2020 (adj.)	**6,905**	**8,228**	**12,807**	**10,297**
25th Percentile	6,068	6,466	11,879	8,513
Min	5,523	4,704	10,645	5,063

* Using the average value driver numbers for the industry

10.8 Limitations

There are several general limitations to mention when regressing key value drivers. First, the relationships between financial metrics, multiples, and macroeconomic conditions change over the years (Damodaran 2002, 38). Second, the regression assumes a normal distribution, which does not always need to hold (Adair and McGreal 1988, 60). The most critical point is that the regressors are likely to be correlated with each other. This multicollinearity leads to larger standard errors, resulting in potentially mislead p-values (Damodaran 2002, 38). A possible solution for multicollinearity would be to gather more data for the regression (Wooldridge 2015, 85). Regarding the regressions conducted in this work, there are notable limitations. The regressions aim to exploit fundamental value drivers of valuation multiples. Therefore, external/macroeconomic factors are not considered. However, in reality, valuations are also driven by macroeconomic factors such as inflation and interest rates, or as in 2021, the worldwide COVID-19 pandemic. These external factors create an unstable market sentiment, in which investors might not behave rationally, and market imperfections, e.g., herding, are more likely to occur. Events that occurred, in e.g., 2020, are captured in the financial metrics of firms over the year, but not in multiples since multiples are taken at the end of the year. Especially in 2020, value drivers incorporate COVID-19 effects, but multiples at the end of the

year might not. Due to these external effects, interpreting the effect of lagged variables might be misleading. Insignificant coefficients for earnings growth or positive beta coefficients might result from market imperfections and other non-fundamental drivers. Furthermore, some of the derived value drivers might not be applicable in the healthcare industry. For example, investors might focus more on R&D spending and the number of intangible assets rather than on earnings growth since many healthcare companies do not generate significant earnings at the beginning. As a consequence, Dvd P/O might have a negative coefficient since reinvested earnings can be a positive sign that the company is operating in the future, especially in R&D-intense industries. Also, a lack of suitable data can influence regression results. As a proxy for growth, the five-year eps CAGR is used. However, other measures for growth, such as forward-looking eps growth can be used. Additional factors, such as market capitalization or a number of patents could explain variations in valuation multiples. Lastly, the data contains extreme values, even after winsorizing each variable. Future literature can conduct regressions for the overall market or other industries to verify the model and use different time horizons and value drivers to further analyse the effect of value drivers on multiples.

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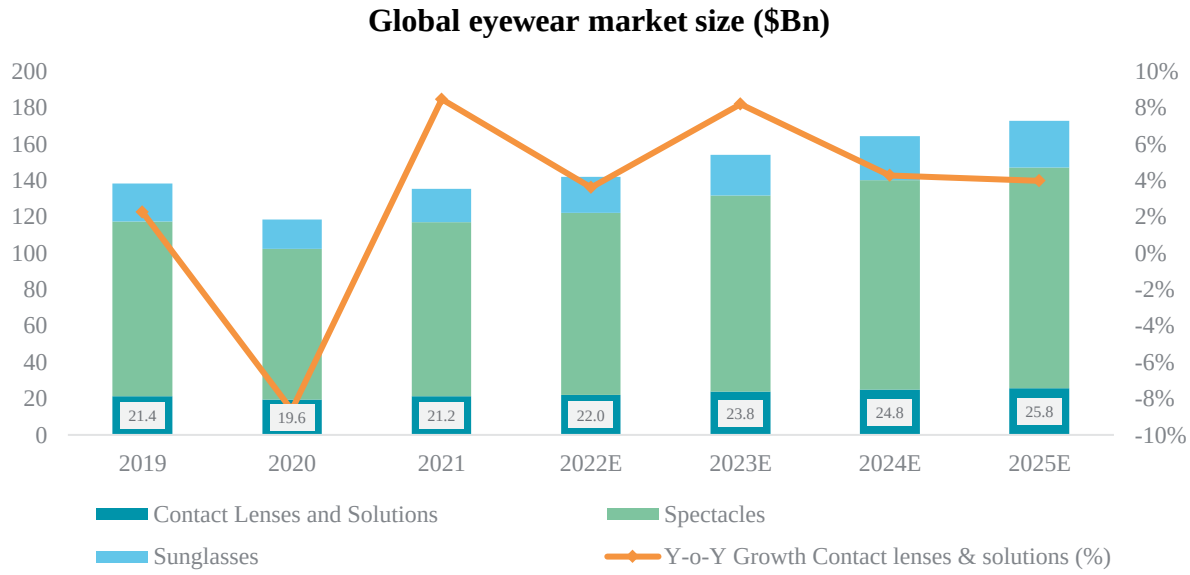
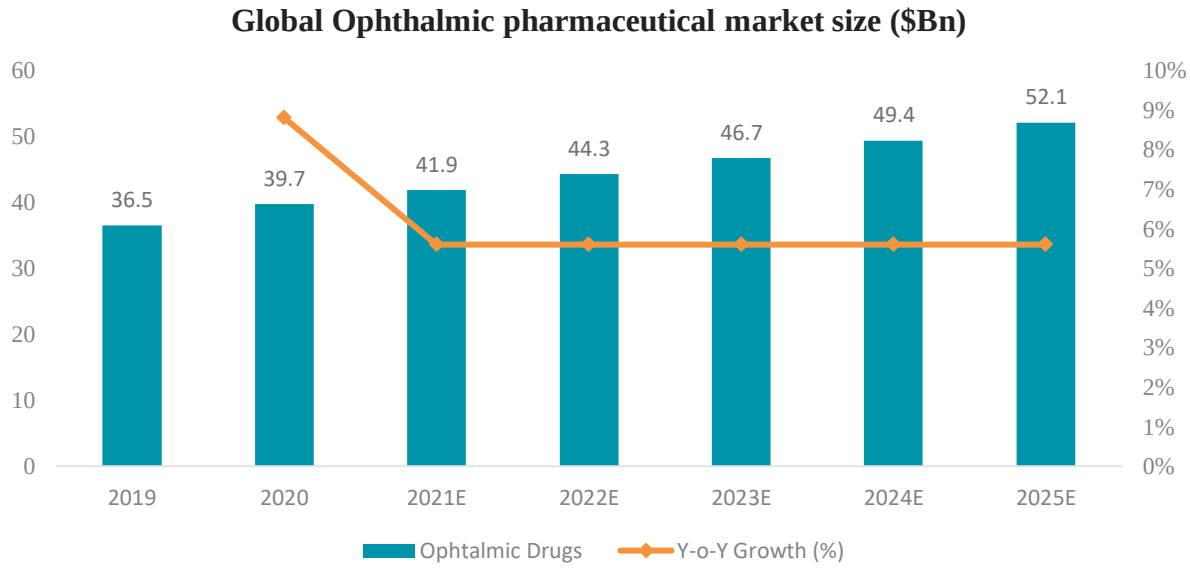
Appendix

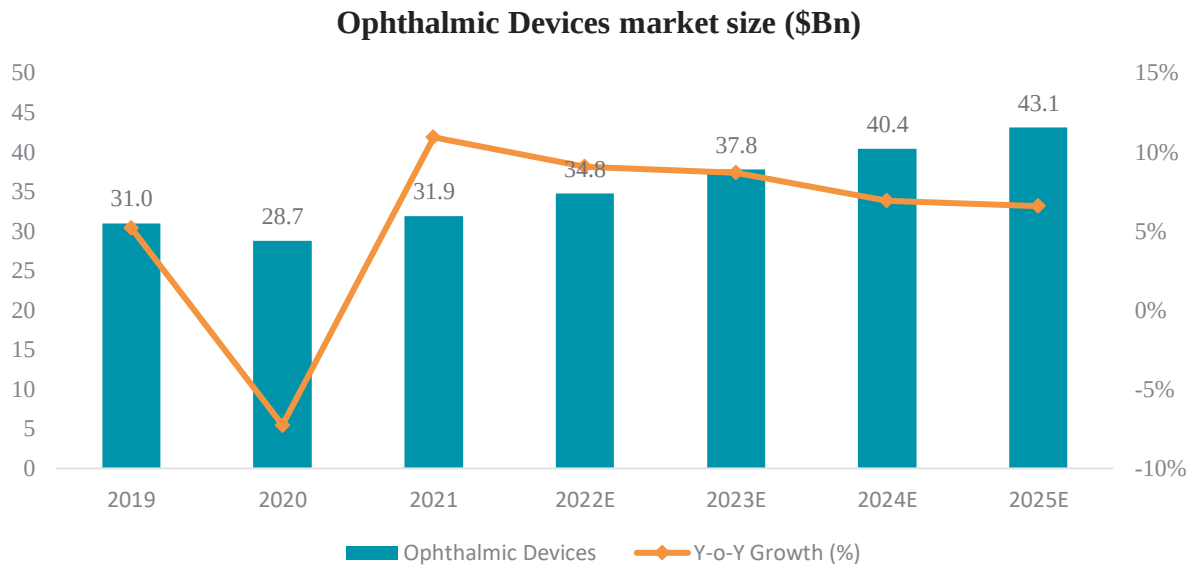
Appendix 1: Vision care industry market size (Euromonitor International 2021)



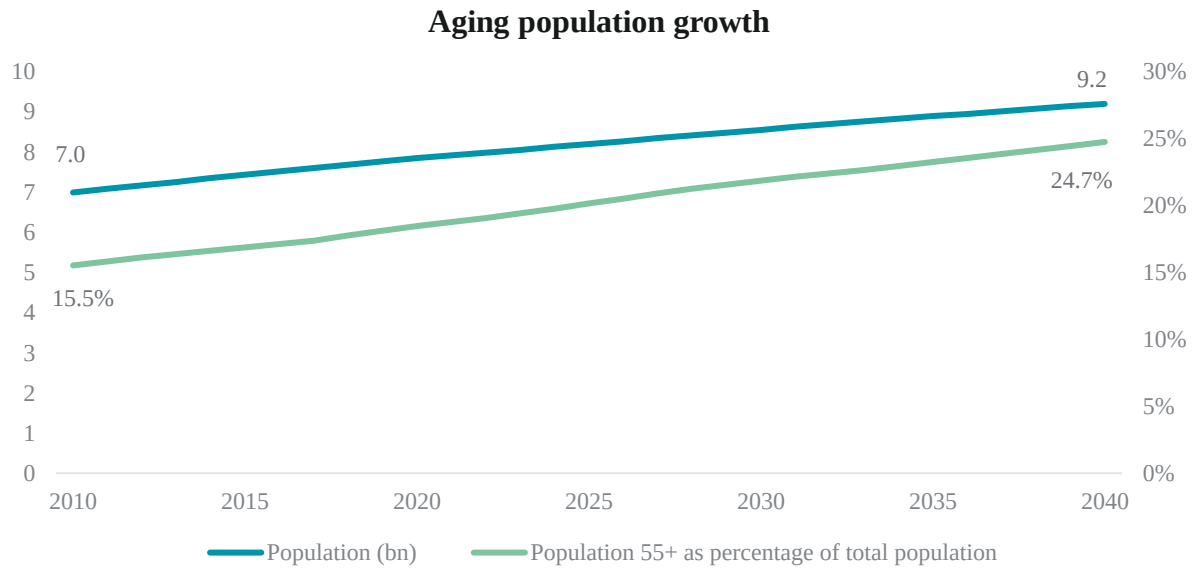
Appendix 2: Ophthalmic pharmaceutical industry market size (Kishor and Linu 2021)



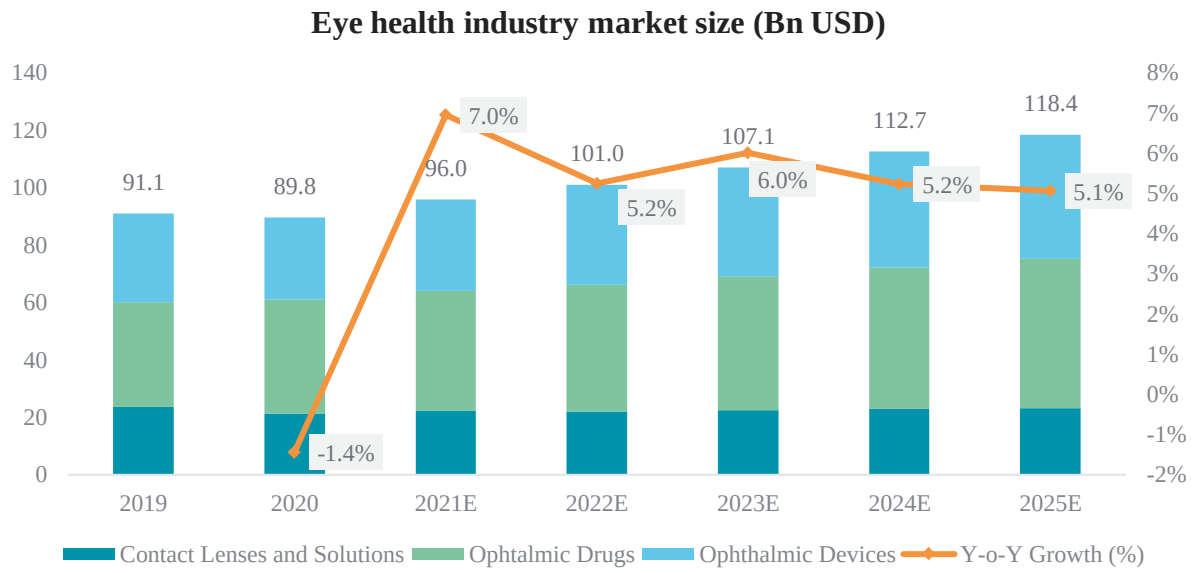
Appendix 3: Ophthalmic devices industry market size (Statista 2021)



Appendix 4: Aging population as a percentage of total population (United Nations - Department of Economic and Social Affairs 2022)



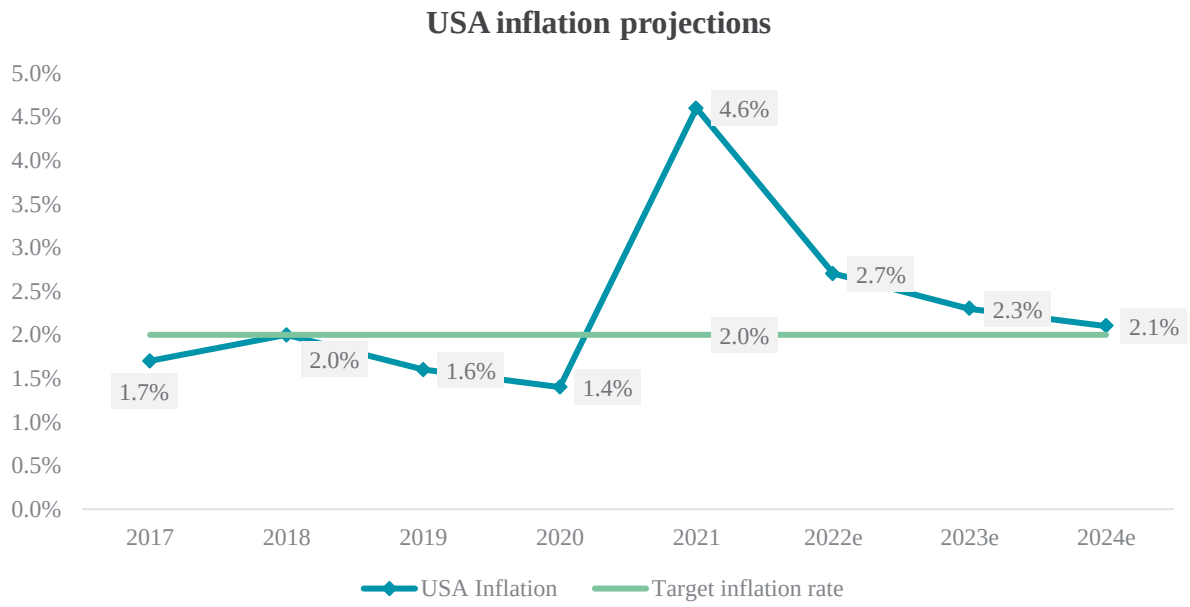
Appendix 5: Total eye care industry market size (Statista & Euromonitor International)



Appendix 6: GDP growth projections (OECD 2021, 13)

	2018	2019	2020e	2021f	2022f	2023f
Low-Income Country	4.7%	4.3%	0.7%	2.9%	4.7%	5.6%
Advanced economies	2.3%	1.6%	-4.7%	5.4%	4.0%	2.2%
United States	3.0%	2.2%	-3.5%	6.8%	4.2%	2.3%
Euro area	1.9%	1.3%	-6.6%	4.2%	4.4%	2.4%
East Asia and Pacific	6.5%	5.8%	1.2%	7.7%	5.3%	5.2%
Latin America	1.8%	0.9%	-6.5%	5.2%	2.9%	2.5%
Middle East and North Africa	0.6%	0.6%	-3.9%	2.4%	3.5%	3.2%
Sub-Saharan Africa	2.7%	2.5%	-2.4%	2.8%	3.3%	3.8%

Appendix 7: USA inflation projections (Federal Reserve 2021, 2)



Appendix 8: Equity risk premium calculation

	Equity Risk Premium	Revenue weight	Weighted ERP
U.S.	4.2%	43.0%	1.8%
China	4.9%	10.4%	0.5%
Japan	4.9%	6.0%	0.3%
France	4.7%	5.3%	0.3%
Germany	4.2%	4.0%	0.2%
Russia	6.4%	3.1%	0.2%
United Kingdom	4.8%	3.0%	0.1%
Canada	4.2%	2.7%	0.1%
Spain	5.8%	2.1%	0.1%
Italy	6.4%	2.0%	0.1%
Other	6.4%	18.6%	1.2%
B + L			**4.9%**

Appendix 9: Bausch + Lomb unlevered betas

ß_u 1 - Simple avg.	0.78
ß_u 2 - Unlevered comps ß	0.77

ß_u 3 - Market cap. weighted avg.	0.68
ß_u 4 - Unlevered market cap. weighted avg. ß	0.67
ß_u 5 - Segment weighted avg.	0.79
ß_u 6 - Unlevered segment weighted avg. ß	0.75

Appendix 10: Bausch + Lomb sensitivity analysis

Appendix 10.1 Terminal value multiple – Sensitivity analysis

Terminal Value Multiple	WACC								
7,443	4.3%	4.8%	5.3%	5.8%	6.3%	6.8%	7.3%	7.8%	8.3%
10.7	7,025	6,872	6,724	6,579	6,438	6,301	6,168	6,039	5,912
11.2	7,301	7,142	6,987	6,836	6,689	6,547	6,408	6,273	6,141
11.7	7,578	7,412	7,250	7,093	6,941	6,792	6,647	6,507	6,370
12.2	7,854	7,681	7,514	7,350	7,192	7,037	6,887	6,741	6,599
12.7	8,130	7,951	7,777	7,608	7,443	7,283	7,127	6,975	6,828
13.2	8,406	8,221	8,040	7,865	7,694	7,528	7,367	7,209	7,056
13.7	8,682	8,490	8,303	8,122	7,945	7,773	7,606	7,444	7,285
14.2	8,959	8,760	8,567	8,379	8,196	8,019	7,846	7,678	7,514
14.7	9,235	9,030	8,830	8,636	8,448	8,264	8,086	7,912	7,743

Appendix 10.2 Terminal value multiple – Long term growth rate

Long-term growth rate	WACC								
7,325	4.3%	4.8%	5.3%	5.8%	6.3%	6.8%	7.3%	7.8%	8.3%
1.0%	10,058	8,698	7,654	6,827	6,156	5,601	5,135	4,738	4,396
1.3%	10,781	9,227	8,054	7,139	6,405	5,804	5,302	4,878	4,514
1.5%	11,632	9,834	8,507	7,487	6,680	6,025	5,484	5,029	4,641
1.8%	12,647	10,540	9,022	7,878	6,985	6,269	5,682	5,192	4,778
2.0%	13,879	11,370	9,616	8,320	7,325	6,538	5,899	5,370	4,926
2.3%	15,407	12,361	10,305	8,824	7,707	6,836	6,136	5,564	5,086
2.5%	17,352	13,564	11,116	9,403	8,139	7,168	6,399	5,775	5,259
2.8%	19,910	15,056	12,083	10,076	8,631	7,541	6,690	6,008	5,448
3.0%	23,427	16,955	13,258	10,868	9,197	7,963	7,015	6,264	5,655

Appendix 10.3 Terminal value multiple – Unlevered free cash flow

UFCF 2027	WACC								
7,325	4.3%	4.8%	5.3%	5.8%	6.3%	6.8%	7.3%	7.8%	8.3%
332	12,646	10,378	8,792	7,621	6,721	6,008	5,430	4,952	4,549
341	12,954	10,626	8,998	7,796	6,872	6,141	5,547	5,056	4,643
350	13,262	10,874	9,204	7,971	7,023	6,273	5,664	5,161	4,738
359*	13,571	11,122	9,410	8,145	7,174	6,405	5,781	5,265	4,832
368*	13,879	11,370	9,616	8,320	7,325	6,538	5,899	5,370	4,926
377	14,188	11,618	9,821	8,495	7,476	6,670	6,016	5,475	5,020
385	14,496	11,866	10,027	8,670	7,628	6,802	6,133	5,579	5,114
394	14,804	12,114	10,233	8,845	7,779	6,934	6,250	5,684	5,208
403	15,113	12,362	10,439	9,020	7,930	7,067	6,367	5,789	5,303

*adjustment for long-term amortization
**excluding adjustment for long-term amortization

Appendix 10.4 Terminal value multiple – EBIT margin

EBIT-Margin \ WACC	15,821	4.3%	4.8%	5.3%	5.8%	6.3%	6.8%	7.3%	7.8%	8.3%
13.3%		17,525	14,486	12,359	10,788	9,580	8,623	7,846	7,202	6,661
15.3%		20,423	16,872	14,387	12,552	11,141	10,022	9,114	8,362	7,729
17.3%		23,322	19,259	16,416	14,315	12,701	11,421	10,382	9,521	8,797
19.3%		26,220	21,645	18,444	16,079	14,261	12,820	11,650	10,681	9,866
21.3%		29,119	24,032	20,472	17,842	15,821	14,218	12,917	11,840	10,934
23.3%		32,017	26,418	22,500	19,606	17,381	15,617	14,185	13,000	12,002
25.3%		34,916	28,804	24,528	21,369	18,941	17,016	15,453	14,159	13,070
27.3%		37,814	31,191	26,556	23,133	20,501	18,415	16,721	15,319	14,139
29.3%		40,713	33,577	28,585	24,896	22,061	19,813	17,989	16,478	15,207

Appendix 11: Estimated Valuation Multiples for Bausch + Lomb (31/12/2021) based on average value drivers for Industry as well as on Bausch + Lomb's value drivers of 2020 (adj.)

	Multiples			
	P / E	P / S	EV / EBITDA	EV / Sales
Max	37.6x	3.2x	20.1x	5.0x
75th Percentile	34.8x	2.7x	18.5x	4.1x
Median	**33.3x**	**2.2x**	**17.2x**	**3.2x**
Industry Average*	**35.2x**	**3.0x**	**17.7x**	**3.9x**
B + L 2020 (adj.)	**36.1x**	**2.2x**	**17.2x**	**2.8x**
25th Percentile	31.8x	1.7x	16.0x	2.3x
Min	28.9x	1.3x	14.3x	1.4x

* Using the average value driver for industry from *Appendix131*

Appendix 12: Regression output TYPE I

Regression I		Regression II	
Variable	Coefficient	Variable	Coefficient
Constant	**0.654*** (0.086)	Constant	**6.485** (5.767)
E/P	**2.418*** (0.677)	Sales/EV	**-0.024** (0.024)
S/P	**0.035*** (0.020)	EBITDA/EV	**1.428*** (0.747)
dNorthamerica	**0.829*** (0.034)	dNorthamerica	**0.897*** (0.033)
R-squared	0.728	R-squared	0.697
N. o. obs.	1,296	N. o. obs.	1,402
F-test	0.000	F-test	0.000

*Significance at a 10% level

Appendix 13: Median of value drivers per regression, Industry Average and Bausch + Lomb's value drivers for 2020 (adj.)

	Value drivers								
Regression	EPS Growth	Beta	Dvd P/O	Profit Margin	Reinvestment rate	ROIC	Effective Tax Rate	Operating Margin	dNorth-america
III	10.4%	0.898	20.1%						
IV	10.3%	0.898	19.5%	9.8%					
V	10.1%	0.891			76.4%	10.0%	22.1%		
VI	10.3%	0.898			80.5%			14.1%	
Industry Average	10.3%	0.896	19.8%	9.8%	78.5%	10.0%	22.1%	14.1%	1
B + L 2020 (adj.)	**-19.9%***	**0.861**	**0.0%**	**6.5%**	**100.0%**	**2.4%**	**21.0%**	**7.3%**	**1**

* EPS growth CAGR (2019-2021) used instead of 5y CAGR due to lack of data

Appendix 14: Summary Statistics for winsorized data (10% level)

Regression I	**Price**	**Constant**	**EP**	**SP**	**dNorthamerica**
N	1296	1296	1296	1296	1296
Mean	1.000	0.074	0.048	0.724	0.650
p50	1.000	0.018	0.035	0.300	1.000
Min	1.000	0.001	0.000	0.001	0.000
Max	1.000	2.915	1.149	29.412	1.000
SD	0.000	0.234	0.064	1.663	0.477

Regression II	**Enterprise value**	**Constant**	**EBITDA/EV**	**Sales/EV**	**dNorthamerica**
N	1402	1402	1402	1402	1402
Mean	1.000	0.002	0.080	0.628	0.652
p50	1.000	0.000	0.058	0.290	1.000
Min	1.000	0.000	0.000	0.004	0.000
Max	1.000	0.115	3.269	111.111	1.000
SD	0.000	0.007	0.147	3.094	0.477

Regression III	**P/E**	**Eps Growth**	**Beta**	**Dvd P/O**	**dNorthamerica**	**d17**	**d18**	**d19**	**d20**	**d21**
N	810	810	810	810	810	810	810	810	810	810
Mean	32.075	0.112	0.894	0.264	0.614	0.191	0.204	0.205	0.199	0.201
p50	27.319	0.104	0.898	0.201	1.000	0.000	0.000	0.000	0.000	0.000
Min	12.998	-0.062	0.612	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Max	65.231	0.310	1.151	0.800	1.000	1.000	1.000	1.000	1.000	1.000
SD	16.601	0.115	0.169	0.277	0.487	0.394	0.403	0.404	0.399	0.401

Regression IV	**P/S**	**Eps Growth**	**Beta**	**Dvd P/O**	**Profit Margin**	**dNorthamerica**	**d17**	**d18**	**d19**	**d20**	**d21**
N	834	834	834	834	834	834	834	834	834	834	834
Mean	3.718	0.110	0.896	0.260	0.113	0.614	0.191	0.200	0.203	0.209	0.198
p50	3.287	0.103	0.898	0.195	0.098	1.000	0.000	0.000	0.000	0.000	0.000
Min	0.679	-0.071	0.612	0.000	0.019	0.000	0.000	0.000	0.000	0.000	0.000
Max	8.715	0.310	1.167	0.801	0.245	1.000	1.000	1.000	1.000	1.000	1.000
SD	2.542	0.118	0.173	0.277	0.075	0.487	0.393	0.400	0.402	0.407	0.399

Regression V	**EV/EBITDA**	**Eps Growth**	**Beta**	**RR**	**ROC**	**Eff. Tx rate**	**dNorthamerica**	**d17**	**d18**	**d19**	**d20**	**d21**
N	702	702	702	702	702	702	702	702	702	702	702	702
Mean	17.235	0.110	0.881	0.722	0.111	0.230	0.568	0.202	0.202	0.197	0.198	0.201

p50	15.694	0.101	0.891	0.764	0.100	0.221	1.000	0.000	0.000	0.000	0.000	0.000
Min	7.823	-0.059	0.604	0.196	0.041	0.108	0.000	0.000	0.000	0.000	0.000	0.000
Max	32.468	0.301	1.133	1.000	0.207	0.377	1.000	1.000	1.000	1.000	1.000	1.000
SD	7.801	0.111	0.170	0.276	0.054	0.086	0.496	0.402	0.402	0.398	0.399	0.401

Regression VI	**EV/Sales**	**Eps Growth**	**Beta**	**RR**	**Operating Margin**	**dNorthamerica**	**d17**	**d18**	**d19**	**d20**	**d21**
N	834	834	834	834	834	834	834	834	834	834	834
Mean	3.928	0.110	0.896	0.740	0.151	0.614	0.191	0.200	0.203	0.209	0.198
p50	3.584	0.103	0.898	0.805	0.141	1.000	0.000	0.000	0.000	0.000	0.000
Min	0.941	-0.071	0.612	0.199	0.044	0.000	0.000	0.000	0.000	0.000	0.000
Max	8.420	0.310	1.167	1.000	0.296	1.000	1.000	1.000	1.000	1.000	1.000
SD	2.367	0.118	0.173	0.277	0.081	0.487	0.393	0.400	0.402	0.407	0.399

Appendix 15: Summary Statistics Regression III (not winsorized)

Regression III	**PE**	**Eps Growth**	**Beta**	**Dvd P/O**	**dNorthamerica**	**d17**	**d18**	**d19**	**d20**	**d21**
N	810	810	810	810	810	810	810	810	810	810
Mean	37.750	0.123	0.895	0.466	0.614	0.191	0.204	0.205	0.199	0.201
p50	27.319	0.104	0.898	0.201	1.000	0.000	0.000	0.000	0.000	0.000
Min	0.870	-0.639	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Max	671.316	1.358	2.244	52.267	1.000	1.000	1.000	1.000	1.000	1.000
SD	42.896	0.191	0.228	2.395	0.487	0.394	0.403	0.404	0.399	0.401

Appendix 16: Correlation Matrix

Regression I	**Price**	**Constant**	**E/P**	**S/P**	**dNorthamerica**
Price	.				
Constant	.	1			
E/P	.	0.082*	1		
S/P	.	0.047	0.309*	1	
dNorthamerica	.	-0.207*	0.039	0.013	1

Regression II	**EV**	**Constant**	**EBITDA/EV**	**Sales/EV**	**dNorthamerica**
EV	.				
Constant	.	1			
EBITDA/EV	.	0.340*	1		
Sales/EV	.	0.109*	0.670*	1	
dNorthamerica	.	-0.068*	-0.042	0.005	1

Regression III	**P/E**	**Eps Growth**	**Beta**	**Dvd P/O**	**dNorthamerica**	**d17**	**d18**	**d19**	**d20**	**d21**
P/E	1									
Eps Growth	0.024	1								
Beta	0.106*	0.107*	1							
Dvd P/O	-0.105*	-0.298*	-0.202*	1						
dNorthamerica	-0.013	0.014	0.439*	-0.318*	1					
d17	-0.105*	-0.061	-0.014	0.023	-0.001	1				
d18	-0.105*	-0.055	0.118*	0.008	0.017	-0.246*	1			

d19	0.043	0.027	0.012	0.015	0.007	-0.247*	-0.257*	1			
d20	0.104*	0.065	0.005	-0.024	0.008	-0.242*	-0.252*	-0.253*	1		
d21	0.062	0.023	-0.123*	-0.023	-0.032	-0.244*	-0.254*	-0.255*	-0.250*	1	

Regression IV	**PS**	**Eps Growth**	**Beta**	**Dvd P/O**	**Profit Margin**	**dNorthamerica**	**d17**	**d18**	**d19**	**d20**	**d21**
P/S	1										
Eps Growth	0.179*	1									
Beta	0.101*	0.111*	1								
Dvd P/O	-0.042	-0.272*	-0.196*	1							
Profit Margin	0.632*	0.255*	0.040	0.017	1						
dNorthamerica	0.103*	0.015	0.435*	-0.321*	0.047	1					
d17	-0.103*	-0.061	-0.018	0.021	-0.031	-0.004	1				
d18	-0.071*	-0.049	0.108*	0.017	-0.035	0.009	-0.243*	1			
d19	0.017	0.046	0.014	0.015	0.028	0.008	-0.245*	-0.252*	1		
d20	0.057	0.042	0.020	-0.033	0.014	0.019	-0.249*	-0.257*	-0.259*	1	
d21	0.098*	0.021	-0.125*	-0.019	0.023	-0.033	-0.241*	-0.249*	-0.250*	-0.255*	1

Regress-ion V	**EV/EBITDA**	**Eps Growth**	**Beta**	**RR**	**ROC**	**Eff. Tx rate**	**dNorthamerica**	**d17**	**d18**	**d19**	**d20**	**d21**
EV/EBITDA	1											
Eps Growth	0.108*	1										
Beta	0.198*	0.093*	1									
RR	0.081*	0.295*	0.199*	1								
ROC	0.102*	0.374*	0.041	0.052	1							
Eff. Tx rate	-0.229*	-0.074	0.006	0.075*	-0.221*	1						
dNorthamerica	0.156*	0.018	0.451*	0.312*	0.076*	-0.012	1					
d17	-0.130*	-0.098*	-0.012	-0.024	0.004	0.167*	0.024	1				
d18	-0.025	-0.055	0.122*	-0.016	-0.015	0.175*	0.024	-0.254*	1			
d19	0.034	0.037	0.039	-0.029	0.015	-0.081*	-0.010	-0.249*	-0.249*	1		
d20	0.060	0.071	-0.016	0.038	0.015	-0.138*	-0.007	-0.250*	-0.250*	-0.246*	1	
d21	0.062	0.046	-0.133*	0.031	-0.018	-0.125*	-0.030	-0.253*	-0.253*	-0.248*	-0.249*	1

Regression VI	EV/ Sales	Eps Growth	Beta	RR	Operating Margin	dNorth america	d17	d18	d19	d20	d21
EV/Sales	1										
Eps Growth	0.166*	1									
Beta	0.129*	0.111*	1								
RR	0.017	0.272*	0.196*	1							
Operating Margin	0.571*	0.251*	-0.002	0.007	1						
dNorth america	0.113*	0.015	0.435*	0.321*	0.040	1					
d17	-0.116*	-0.061	-0.018	-0.021	0.017	-0.004	1				
d18	-0.073*	-0.049	0.108*	-0.017	-0.007	0.009	-0.243*	1			
d19	0.030	0.046	0.014	-0.015	-0.008	0.008	-0.245*	-0.252*	1		
d20	0.058	0.042	0.020	0.033	-0.025	0.019	-0.249*	-0.257*	-0.259*	1	
d21	0.098*	0.021	-0.125*	0.0190	0.024	-0.033	-0.241*	-0.249*	-0.250*	-0.255*	1

Appendix 17: Sensitivity Analysis

P / E	36.1	0.76	0.79	0.81	0.84	0.86	0.89	0.91	0.94	0.96
Dvd P/O	0.0%	34.6x	35.0x	35.3x	35.7x	**36.1x**	36.5x	36.8x	37.2x	37.6x
	10.0%	33.9x	34.3x	34.6x	35.0x	35.4x	35.8x	36.1x	36.5x	36.9x
	20.0%	33.2x	33.6x	33.9x	34.3x	34.7x	35.1x	35.4x	35.8x	36.2x
	30.0%	32.5x	32.8x	33.2x	33.6x	34.0x	34.4x	34.7x	35.1x	35.5x
	40.0%	31.8x	32.1x	32.5x	32.9x	33.3x	33.6x	34.0x	34.4x	34.8x
	50.0%	31.1x	31.4x	31.8x	32.2x	32.6x	32.9x	33.3x	33.7x	34.1x
	60.0%	30.3x	30.7x	31.1x	31.5x	31.9x	32.2x	32.6x	33.0x	33.4x
	70.0%	29.6x	30.0x	30.4x	30.8x	31.1x	31.5x	31.9x	32.3x	32.7x
	80.0%	28.9x	29.3x	29.7x	30.1x	30.4x	30.8x	31.2x	31.6x	31.9x

P / S	2.2	0.76	0.79	0.81	0.84	0.86	0.89	0.91	0.94	0.96
Profit Margin	2.5%	1.3x	1.3x	1.3x	1.3x	1.4x	1.4x	1.4x	1.4x	1.5x
	3.5%	1.5x	1.5x	1.5x	1.6x	1.6x	1.6x	1.6x	1.7x	1.7x
	4.5%	1.7x	1.7x	1.7x	1.8x	1.8x	1.8x	1.8x	1.9x	1.9x
	5.5%	1.9x	1.9x	2.0x	2.0x	2.0x	2.0x	2.1x	2.1x	2.1x
	6.5%	2.1x	2.1x	2.2x	2.2x	**2.2x**	2.2x	2.3x	2.3x	2.3x
	7.5%	2.3x	2.4x	2.4x	2.4x	2.4x	2.5x	2.5x	2.5x	2.5x
	8.5%	2.5x	2.6x	2.6x	2.6x	2.6x	2.7x	2.7x	2.7x	2.7x
	9.5%	2.8x	2.8x	2.8x	2.8x	2.9x	2.9x	2.9x	2.9x	3.0x
	10.5%	3.0x	3.0x	3.0x	3.0x	3.1x	3.1x	3.1x	3.1x	3.2x

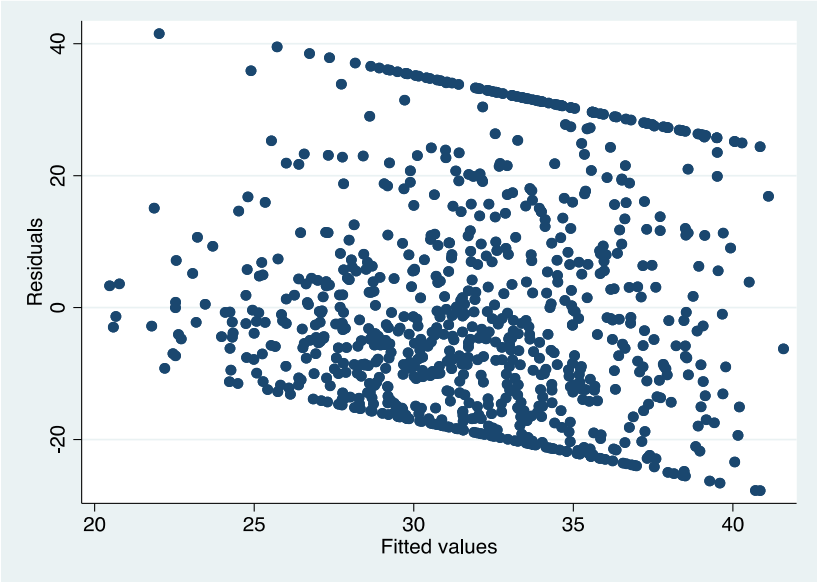
		Beta								
EV / EBITDA	17.2	0.76	0.79	0.81	0.84	0.86	0.89	0.91	0.94	0.96
Effective Tax Rate	9.0%	18.6x	18.8x	19.0x	19.2x	19.4x	19.6x	19.7x	19.9x	20.1x
	12.0%	18.1x	18.3x	18.5x	18.6x	18.8x	19.0x	19.2x	19.4x	19.6x
	15.0%	17.5x	17.7x	17.9x	18.1x	18.3x	18.5x	18.7x	18.9x	19.0x
	18.0%	17.0x	17.2x	17.4x	17.6x	17.8x	17.9x	18.1x	18.3x	18.5x
	21.0%	16.5x	16.7x	16.8x	17.0x	**17.2x**	17.4x	17.6x	17.8x	18.0x
	24.0%	15.9x	16.1x	16.3x	16.5x	16.7x	16.9x	17.0x	17.2x	17.4x
	27.0%	15.4x	15.6x	15.8x	15.9x	16.1x	16.3x	16.5x	16.7x	16.9x
	30.0%	14.8x	15.0x	15.2x	15.4x	15.6x	15.8x	16.0x	16.2x	16.3x
	33.0%	14.3x	14.5x	14.7x	14.9x	15.1x	15.2x	15.4x	15.6x	15.8x

		Beta								
EV / Sales	2.8	0.76	0.79	0.81	0.84	0.86	0.89	0.91	0.94	0.96
Operating Margin	0.0%	1.4x	1.4x	1.4x	1.5x	1.5x	1.6x	1.6x	1.7x	1.7x
	2.5%	1.8x	1.8x	1.9x	1.9x	1.9x	2.0x	2.0x	2.1x	2.1x
	5.0%	2.2x	2.2x	2.3x	2.3x	2.4x	2.4x	2.5x	2.5x	2.5x
	7.5%	2.6x	2.7x	2.7x	2.7x	**2.8x**	2.8x	2.9x	2.9x	3.0x
	10.0%	3.0x	3.1x	3.1x	3.2x	3.2x	3.2x	3.3x	3.3x	3.4x
	12.5%	3.4x	3.5x	3.5x	3.6x	3.6x	3.7x	3.7x	3.8x	3.8x
	15.0%	3.9x	3.9x	3.9x	4.0x	4.0x	4.1x	4.1x	4.2x	4.2x
	17.5%	4.3x	4.3x	4.4x	4.4x	4.5x	4.5x	4.5x	4.6x	4.6x
	20.0%	4.7x	4.7x	4.8x	4.8x	4.9x	4.9x	5.0x	5.0x	5.0x

Appendix 18: Income Statement Adjusted (for Income Tax)

Total Revenue	3,412
COGS	(1,269)
Gross Profit	2,143
Operating Expenses	(1,893)
EBIT	250
Foreign Exchange	27
Interest Income	3
EBT	280
Income Tax Expense	**59**
Net Income Available for Common	**221**

Appendix 19: Scatter plot of fitted values vs. residuals (Regression III, winsorized data)



Appendix 20: Derivation of value drivers

DDM: $P_0 = \frac{DPS_1}{r-g_n}$ with DPS = Dividend per share

PE: $\frac{P_0}{EPS_0} = \frac{Payout\ Ratio*(1+g_n)}{r-g_n}$ (derived from DDM)

PS: $\frac{P_0}{Sales} = \frac{Net\ Profit\ Margin*Payout\ Ratio*(1+g_n)}{r-g_n}$ (derived from DDM)

DCF: $V_0 = \frac{FCFF_1}{WACC-g}$

with $FCFF = EBITDA*(1-t) + Depr.*t - Capex - \Delta Working\ Capital$

EV/EBITDA: $EV = \frac{EBITDA*(1-t)+Depr.*t-Capex-\Delta\ Working\ Capital}{WACC-g}$

divided by EBITDA results in

$\frac{EV}{EBITDA} = \frac{(1-t)}{WACC-g} + \frac{Depr.*t/EBITDA}{WACC-g} + \frac{Capex/EBITDA}{WACC-g} - \frac{\Delta\ Working\ Capital/EBITDA}{WACC-g}$ (derived from DCF)

EV/Sales: $\frac{EV}{Sales_0} = After-tax\ operating\ margin * [\frac{(1-RR_{growth})*(1+g)*\left(1-\frac{(1+g)^n}{(1+WACC)^n}\right)}{WACC-g} +$

$\frac{(1+RR_{stable})*(1+g)^n*(1+g_n)}{(WACC-g_n)*(1+WACC)^n}$] with $FCFF = EBIT * (1-t) * (1-RIR)$, g = growth rate in after-tax operating income for the first n years, g_n = growth rate in after-tax operating income after n years forever (stable growth rate) and $RR_{growth,stable}$ = reinvestment rate in high growth and stable periods (derived from DCF).

Appendix 21: NYSE and TSX Group stock exchange characteristics

	NYSE	**TSX Group**
Country	USA	Canada
Currency	USD	CAD
Market cap ($Tn)	24.1	2.8
Number of 2021 IPOs	108	47
2021 IPO proceeds ($Bn)	58.2	5.9
20/21 Index Performance	22.6%	24.1%
FTC	Initial: < $295.000 Annual: min. $74.000	Initial: < $117.740 Annual: < $94.000