Equity Valuation of PUMA SE

Fabian Arndt

Dissertation written under the supervision of
Professor José Carlos Tudela Martins

Dissertation submitted in partial fulfilment of requirements for the MSc in
Finance, at the Universidade Católica Portuguesa, June 6th 2019.

| Company: PUMA SE
Industry: Sportswear
Listed: Frankfurt Stock Exchange
Bloomberg: PUM GR
Reuters: PUMG.DE | Recommendation: HOLD
Target Share Price: €505,91
Current Share Price: €481,50
(as of 13 February 2019)
Potential: +5,07% | Value Indicators:
DCF: 511,99
EV/Sales: €634 \| EV/EBITDA: €432
EV/EBIT: €478 \| P/E: €485 |

Investment Summary

14 February 2019

Summary:

The management guidance of Feb 18 for sales growth of 10% was outperformed with 17.6%, ending up in a strong EBIT of €337m. Given a strong global brand recognition momentum across various product lines and a full order book for Q1/19 we expect PUMA to continue its trend on sales growth with 10.4% in FY19 and 10.0% in FY20. We predict the EBIT margin to decrease slightly from 7.3% in FY18 to 7,1% in FY19 and 7.2% in FY20 due to increasing OPEX mainly triggered by a higher level of marketing expenses. CAPEX is expected to increase significantly from €138m in FY18 to €205m in FY19, in line with management guidance (€200m). PUMA transformed its business over the past years by identifying new sport style trends and transforming them into fashionable and high performance products that leverage sales. Furthermore, its marketing strategy to sign high profile celebrities (Rihanna, Selena Gomez, Jay-Z) seems to be paying off well.

World Economy, Industry, Competitors:

The European market is challenging due to Brexit uncertainties and high competition. Opportunities can be seen in the fastest growing region of Asia, where conditions are more favorable.

Despite the strong upwind, PUMA still lacks in market share and brand heat compared to its major competitors Adidas and Nike which results in scale disadvantages when signing sport stars for marketing purpose.

Valuation Summary:

The values obtained by the DCF model and multiples are weighted and a price recommendation of €505.91 is issued. Compared to the share price of €481.50 it demonstrates a 12-month upside potential of 5.07%. Overall, this leads to a HOLD recommendation for PUMA shares.

Valuation Notes:

Two different valuation approaches were applied to receive a fair value share price of PUMA. On the one hand, the DCF valuation yields a price of €511.99, representing an upside potential of 6.33%. On the other hand, the 1-year forward multiple approach including EV/Sales, EV/EBITDA, EV/EBIT and P/E result in a median indicated price of €633.10, €431.71, €477.28 and €484.86, respectively.

3-Year Indexed Weekly Performance
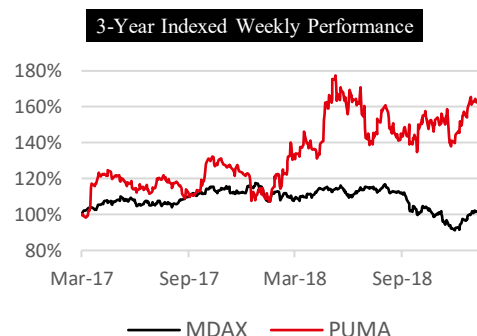
Stock Performance			
	1W	1M	3M
Absolute	0.21%	4.79%	6.88%
Relative (vs. MDAX)	-0.03%	-0.86%	7.66%
Current Share Price	13 February 2019		481.50 €
52-Week High	05 June 2018		525.00 €
52-Week Low	14 February 2018		317.00 €

Valuation Metrics		
	2018	2019
DCF		
WACC	5.85%	
Tax Rate	26.57%	
Revenue CAGR FY19-FY27	7.48%	
Terminal Growth Rate	2.20%	
Multiples		
EV/Sales		1.9x
EV/EBITDA		14.7x
EV/EBIT		20.2x
P/E		30.8x

Key Ratios (Historical)			
	2016	2017	2018
Gross Margin	45.7%	47.3%	48.4%
EBITDA Margin	5.2%	7.6%	9.0%
EBIT Margin	3.5%	5.9%	7.3%
Pretax ROE	7.2%	13.9%	18.8%
Current Ratio	1.05	1.78	1.83
x Interest Earned	9.50	13.70	22.40
Cash Cycle (Days)	76	67	75
D / E Ratio	2.4%	3.7%	11.8%
Net Debt / Equity	-16.7%	-21.8%	-15.4%

in €m	Summary Financials Historical					Summary Financials Forecast									
	2014	2015	2016	2017	2018	2019E	2020E	2021E	2022E	2023E	2024E	2025E	2026E	2027E	TV
Revenues	2,972	3,387	3,627	4,136	4,648	5,131	5,644	6,187	6,842	7,453	7,992	8,416	8,703	8,894	9,090
Change Sales Y-o-Y	*-0.4%*	*14.0%*	*7.1%*	*14.0%*	*12.4%*	*10.4%*	*10.0%*	*9.6%*	*10.6%*	*8.9%*	*7.2%*	*5.3%*	*3.4%*	*2.2%*	*2.2%*
EBIT	128	96	128	245	337	363	409	453	492	520	532	559	578	590	603
EBIT Margin	*4.3%*	*2.8%*	*3.5%*	*5.9%*	*7.3%*	*7.1%*	*7.2%*	*7.3%*	*7.2%*	*7.0%*	*6.7%*	*6.6%*	*6.6%*	*6.6%*	*6.6%*
EBITDA	186	154	188	315	419	454	507	559	609	647	669	704	727	743	759
EBITDA Margin	6.3%	4.5%	5.2%	7.6%	9.0%	8.8%	9.0%	9.0%	8.9%	8.7%	8.4%	8.4%	8.4%	8.4%	8.3%
Net Income	64	37	62	136	187	235	264	293	319	337	347	367	380	391	401
NOPAT					254	266	300	332	361	382	391	411	424	433	443
FCFF					87	32	104	124	121	158	192	256	319	363	407
# Shares Outstanding	*14.95*	*14.95*	*14.95*	*14.95*	*14.95*	*14.95*	*14.95*	*14.95*	*14.95*	*14.95*	*14.95*	*14.95*	*14.95*	*14.95*	*14.95*
EPS (€)	4.29	2.48	4.18	9.08	12.53	15.73	17.69	19.58	21.31	22.58	23.25	24.52	25.45	26.14	26.84
Dividend per Share (€)	0.50	0.50	0.75	12.50	3.50	3.93	4.42	4.90	5.33	5.64	5.81	6.13	6.36	6.53	6.71
Cash & Cash Equivalents	402	339	327	415	464	385	408	443	467	523	612	761	972	1226	1487
Net Debt	-381	-318	-285	-355	-263	-165	-167	-179	-178	-207	-268	-388	-569	-792	-1021

List of Contents

List of Figures

List of Tables

List of Abbreviations

$ .... Dollar (Currency)

% .... Percentage

& .... And

€ .... Euro (Currency)

AG .... Aktiengesellschaft

APV .... Adjusted Present Value

Bn .... Billion

CAGR .... Compound Annual Growth Rate

CAPEX .... Capital Expenditures

CAPM .... Capital Asset Pricing Model

CCC .... Cash Conversion Cycle

CEO .... Chief Executive Officer

CF .... Cash Flow

COGS.......................... Cost of Goods Sold

Corp .... Corporation

DAX .... Deutscher Aktienindex

DCF .... Discounted Cash Flow

DDM .... Dividend Discount Model

DIO .... Days Inventory Outstanding

DPO .... Days Payable Outstanding

DSO .... Days Sales Outstanding

DPS .... Dividend per Share

E.g. .... exempli gratia (for example)

EPS.............................. Earnings per Share

FCF .... Free Cash Flow

E .... Equity

EBIT .... Earnings before Interest and Taxes

EBITDA...................... Earnings before Interest Taxes Depreciation & Amortization

ECB............................. European Central Bank

EV .... Enterprise Value

WACC .... Weighted Average Cost of Capital

WC .... Working Capital

Y .... Year

Y-o-Y .... Year-over-Year

YTM............................ Yield-to-Maturity

List of Formulas

Abstract

The purpose of the dissertation is to determine a target price per share for the sportswear producer PUMA SE that is listed on the German MDAX. Based on this value and relative to the current market price, a buy, hold or sell recommendation is provided. Hence, the underlying research question of this dissertation is: *"What is the fair value per share for PUMA SE on 31 December 2018 and the implied investment recommendation on 13 February 2019?"*. The obtained share price is based on a combination of two valuation methods: The discounted cash flow model and a relative valuation approach based on multiples that result in a price per share of €505.91. The valuation is an outcome of a comprehensive market, industry and company analysis. By comparing the computed share price with the current market price of €481.50 as of 13 February 2019, a hold recommendation with upside potential of 5.07% is issued. Finally, selected assumptions and results are compared with the equity report of PUMA SE from Warburg Research. All information and data in this publication stem from publicly available sources.

Author: Fabian Arndt
Title: Equity Valuation of PUMA SE
Key words: Equity Valuation, Corporate Finance, Share Price, DCF, Multiples, PUMA SE

Resumo

A dissertação tem como propósito determinar o preço intrínseco por ação da marca desportiva PUMA SE, cotada na bolsa alemã MDAX. Com base nesta avaliação é recomendada uma estratégia de compra, venda ou neutral face ao preço de mercado atual. Deste modo, esta dissertação pretende responder à seguinte pergunta: *"Qual era o valor intrínseco por ação da PUMA SA a 31 de dezembro de 2018 e qual a estratégia de investimento recomendada a 13 de fevereiro de 2019?"* Tendo em conta a análise do mercado e da indústria em que a PUMA SE se insere, o valor intrínseco por ação da empresa é de €505.91 Esta avaliação baseou-se essencialmente em dois métodos de avaliação: *cash flows* descontados e múltiplos prospetivos, utilizando múltiplos de mercado. Comparando o valor intrínseco da empresa com o preço de mercado registado a 13 de fevereiro de 2019, recomenda-se uma estratégia de neutral, com um ganho potencial de 5,07% caso o preço de mercado iguale o valor intrínseco da empresa. Por último, toda a informação necessária para esta análsie foi recolhida em fontes públicas e todos os resultados e assunções presentes foram comparados com o previsão sobre Puma SE do Warburg Research".

Autor: Fabian Arndt
Título: Equity Valuation of PUMA SE
Palavras-chave: Equity Valuation, Corporate Finance, Share Price, DCF, Multiples, PUMA SE

Acknowledgement

The steps towards my master dissertation were the most formative of my lifetime. It was an eventful path that made me grow personally and academically. All my achievements and experiences wouldn't be possible without the support of my personal surroundings for what reason I want to share my sincere appreciation, at least with a few words.

A special thanks goes to my parents and my sister who always believed in me and gave support beyond my needs.

Moreover, I want to thank my childhood friends, Michael and Richard, Jonas and many others; even though I wasn't there for a long time, our friendship never weakened.

During my masters at Católica, my colleagues became friends who always brought me joy during this intense program. Thank you, Peter, Roman, Tom and all the others that brought life at Católica and outside the classroom not just one level up. Thank you, Gregor and Nicolas, for making my exchange semester in Rio de Janeiro an unforgettable adventure. Thank you, Marta, for this wonderful experience during my stay in Lisbon. Thank you, Martin and Denis, for our insightful discussions and your great support for my thesis.

Finally, I would like to thank Professor Tudela Martins for the excellent support and guidance for this dissertation.

1 Introduction

The valuation of a company serves to determine the theoretical price for a company. The value of a company may differ for buyers, sellers or other parties (Fernández 2002).

The objective of this dissertation is to provide a rational and reliable valuation of PUMA SE, a sportswear producer and distributer, publicly listed on the German MDAX. The fair value share price is estimated based on the company´s results as of 31 December 2018 and subsequently compared with the market price on 13 February 2019, the day before the publication of PUMA's annual report for fiscal year 2018. This comparison of prices enables potential investors an adequate basis for a buy, hold or sell decision. Thus, the research question for this dissertation is formulated as follows:

What is the fair value per share for PUMA SE on 31 December 2018 and the implied investment recommendation on 13 February 2019?

This evaluation is based on publicly available information from PUMA as well as other public market information. The paper is organized as follows: The second section provides an overview of general company valuation literature and is contextualized by means of PUMA's characteristics. The third section gives an overview of the current situation of the world economy in the context of PUMA´s exposure. In section four, the sports apparel industry is analyzed to discover opportunities and risks in this sector and to identify relevant forecast indicators. The fifth section is a detailed company analysis based on financial, operational and strategic factors. The DCF valuation is explained in chapter six, followed by an illustration of the relative valuation in chapter seven. Chapter eight summarizes the results of the conducted valuation approaches, including a buy, hold or sell recommendation. In chapter nine, the obtained results are compared with an equity research report of PUMA by Warburg Research. Chapter 10 concludes all valuation results.

2 Literature Review

The term value is endowed with a variety of definitions, but for the purpose of this work it is the result of calculating the equity of a firm, or shareholder value, which is the part of a company that belongs to its shareholders. This value can be obtained by three distinct methods: First, the intrinsic valuation methods which are based on future cash flow projections. Second, the real options approach, where option pricing techniques help to determine the value of the company. Third, the relative valuation methods that use similar companies with a known market value to estimate the value of the underlying company's shares (Pereiro 2002).

The most prevailing methods for analysts to estimate the value of a company are discounted cash flow models and relative approaches according to Demirakos et al. (2004). Other methods are the asset-based valuation and the real option valuation. The following valuation models are selected based on the characteristics of PUMA SE.

2.1 Fundamentals of Intrinsic Valuation Methods

Intrinsic valuation models measure the value of a company based on the present value of its projected cash flows at a risk-adjusted discount rate (Reilly and Brown 2011). Specific company characteristics are the crucial components in order to identify the intrinsic values of its assets. A general formula for estimating the value of a firm by discounting expected cash flows can be described as follows (Rosenbaum and Pearl 2009).

$$V_i = \sum_{t=1}^{n} \frac{CF_t}{(1+k)^t} \tag{1}$$

Where:
$V_i = Value\ of\ stock\ i$
$CF_t = Cash\ flow\ at\ period\ t$
$k = Discount\ rate$
$n = Count\ of\ years\ of\ the\ lifetime\ of\ asset\ i$

Formula 1: Discounted cash flow model

To understand the concepts of discounting cash flow models, it is essential to master the fundamentals of discount rates. For that reason, the principles of this methodology are explained in the following chapters.

2.1.1 Discount Rate

The discount rate determines the present value of future cash flows and is a function of the riskiness of forecast cash flows (Damodaran 2012). Depending on the valuation approach, the

discount factor consists of the components cost of equity or a combination of cost of equity and cost of debt.

2.1.2 Cost of Equity

The cost of equity can be estimated using the capital asset pricing model (CAPM), based on the portfolio theory of Markowitz (1952) and is independently developed by Sharpe (1964), Lintner (1965) and Mossin (1966). Until today it is the most widely used model in valuation practice to determine the expected return of an investment. The CAPM is based on a one-period model with equilibrium in the capital markets under specific assumptions.[1] The fundamental equation of the CAPM describes the relationship between the expected return of an investment on the capital market and its risk (Ross 1977).

$$E(R_i) = r_f + \left(E(R_m) - r_f\right) \times \beta_i \qquad (2)$$

Where:
$E(R_i) = Expected\ return\ of\ investment\ i$
$r_f = Risk\text{-}free\ rate$
$E(R_m) = Expected\ return\ of\ the\ market$
$\beta_i = Beta\ (systematic\ risk)$

Formula 2: Cost of equity

The core thesis states that in a capital market equilibrium, the expected return of any risky investment $E(R_i)$ equals a risk-free return r_f plus a risk premium. This risk premium results from the multiplication of the market risk premium (MRP) with the systematic risk β_i. The MRP measures to the price that investors demand for the risk of the investment and is described by $(E(R_m) - r_f)$ (Koller et al. 2015). The expected return is equivalent to the cost of equity. It is explained as the required return by investors to invest in this company rather than in an alternative investment. In other words, the cost of equity corresponds to opportunity costs for the equity holder (Frykman and Tolleryd 2003). Alternatively to the CAPM, the Fama and French 3-Factor model proposed by Fama, E. F./French, K. R. (1993) can be applied. Due to its practicability, the CAPM is preferred by analysts and is consequently applied for the valuation of PUMA.

---

[1] For further information, see for example Copeland and Weston 2000).

2.1.2.1 Risk-free Rate

The risk-free rate corresponds to an investment with riskless characteristics (Koller et al. 2015). The investment is risk-free if there is no deviation from its expected return, so that the actual return is equal to the expected return. According to the literature, sovereign bonds are preferred to replicate this riskless investment. Damodaran (2008) and other authors suggest a 10-year AAA-rated government bond to comply with the period of the forecasted cash flows of the company. Beyond that, the bond must be traded and denominated in the same currency in which the company operates (Koller et al. 2015; Damodaran 2008).

2.1.2.2 Beta

The beta factor measures the systematic risk that cannot be eliminated by diversifying a portfolio of securities. The unsystematic risk reflects the investment-specific risk, for example due to management errors or credit risk. This risk can be remedied by diversifying the portfolio (Copeland et al. 2007).

Common sources like Bloomberg or Reuters provide beta estimations but are often imprecise. It is suggested to use a set of peer group betas from the same industry on a levered basis and modify it for a firms' financial leverage to obtain the unlevered beta (Koller et al. 2015).

$$\beta_u = \frac{\beta_l}{1 + (1 - t) * \left(\frac{D}{E}\right)} \tag{3}$$

Where:
$\beta_u = Unlevered\ beta$
$\beta_l = Levered\ beta$
$t = Corporate\ tax\ rate$
$D = Debt$
$E = Equity$

Formula 3: Unlevered beta

Another method is a regression by dividing the covariance of the historical returns of the investment i and the return of the market portfolio m divided by the variance of the market portfolio's returns. The market portfolio can be a national market index or an international index such as the MSCI World Index (Koller et al. 2015).

$$\beta_i = \frac{\sigma(R_i, R_m)}{\sigma_m^2} \tag{4}$$

Where:
$\beta_i = Beta\ of\ investment\ i$
$\sigma(R_i, R_m) = Covariance\ of\ investment\ i\ und\ market\ portfolio\ m$
$\sigma_m^2 = Variance\ of\ the\ market\ portfolio\ m$

Formula 4: Levered Beta

There is evidence that by using regressions the forecasted betas are closer to one than the determined values calculated from historical data. For this reason, Blume (1979) suggests the following adjustment which is also applied for the DCF valuation of PUMA.

$$Adjusted\ \beta_i = \frac{2}{3} * raw\ \beta_i + \frac{1}{3} * raw\ \beta_m \tag{5}$$

Where:
$\beta_i = Beta\ of\ investment\ i$
$\beta_m = Beta\ of\ the\ market\ portfolio = 1$

Formula 5: Blume adjustment

2.1.2.3 Market Risk Premium

The market risk premium (MRP) is defined as the difference between the expected return of the market portfolio and the risk-free return. The MRP corresponds to the additional return required for investments in a diversified portfolio of risky assets above the risk-free interest rate. There are various models for assessing the MRP (Damodaran 2006). However, the adequate value is highly discussed among academics. Koller et al. (2015) proposes a MRP of approximately 5%, Frykman and Tolleryd (2003) suggest a rate between 5% and 6% and KPMG in its recommendation of 7% in its latest quarterly issued publication (KPMG 2018a). In Germany, the Institute of Public Auditors in Germany (IDW) recommends a range between 5.5%-7%. A value within this range is used for assessing the CAPM for PUMA.

2.1.3 Cost of Debt

The cost of debt describes the funding costs of a company's borrowings. If the entity has frequently traded debt, the calculation is relatively simple. In this case, the after-tax yield to maturity (YTM) on the long-term debt is used as a proxy. The after-tax YTMs include the tax shield in the WACC. Scholars argue that the low default probability of these companies makes possible noise negligible (Koller et al. 2015). Without bonds, reliable independent credit ratings provide comparable values from peer companies with outstanding bonds. If there is no rating

7

assigned, the creation of synthetic ratings can help with an approximation (Damodaran 2012). As PUMA has negative net debt in its target capital structure, the calculation of the cost of debt is negligible for the discount rate that is described in the following chapter.

2.1.4 Weighted Average Cost of Capital

The weighted average cost of capital (WACC) is the discount rate that represents the weighted average costs of a company's equity and debt. It reflects the risk of the projected free cash flows. The cost of debt is reduced by the corresponding tax rate to reflect the arising interest tax shields (Damodaran 2011).

$$WACC = k_d * (1 - t) * \frac{D}{D + E} + k_e * \frac{E}{D + E} \qquad (6)$$

Where:
$WACC = Weighted\ average\ cost\ of\ capital$
$D = Market\ value\ of\ debt$
$E = Market\ value\ of\ equity$
$k_d = Cost\ of\ debt = required\ rate\ of\ return\ by\ debt\ holders$
$k_e = Cost\ of\ equity = required\ rate\ of\ return\ by\ equity\ holders$
$t = Tax\ rate$

Formula 6: Weighted average cost of capital

Higher discount rates imply riskier cash flows. The riskiness is defined as the likelihood of default as well as the variation of the actual returns around the expected returns (Damodaran 2011). An important prerequisite for an appropriate use of the WACC is to define a target debt ratio or a constant leverage ratio (Fernandez 2006; Booth 2002).

There is a wide discussion about a suitable tax rate. Damodaran (2012) prefers the effective tax rate for early forecasts and the marginal tax rate in perpetuity. He argues that it is dangerous to assume that taxes can be deferred forever. Other authors argue to apply the effective tax rate. Fernandez (2006) relies on the application of the effective tax rate for international operating companies due to taxation differences in each country. On this basis, PUMA's valuation model is based on the average effective tax rate of the last three years.

2.2 Valuation Approaches

There exist several discounted cash flow methods that can be applied to determine the value of the asset. In the following, three widely used models are evaluated.

2.2.1 Dividend Discount Model

The dividend discount model (DDM) is the longest existing present value model. By applying this approach, dividends represent an appropriate definition of future cash flows (Pinto et al. 2015). Hereinafter, the value of an ordinary stock is hereinafter the present value of future dividends (Reilly and Brown 2011; Williams 1938).

$$V_0 = \sum_{t=1}^{n} \frac{D_t}{(1 + k_e)^t} \tag{7}$$

Where:
V_0 = Stock value at time 0
D_t = Expected dividend per share in year t (end of year pay-out)
k_e = Discount rate at the required rate of return on equity

Formula 7: Dividend discount model

The implied problems arise with the impossibility of an infinite dividend forecast. A simplification such as the Gordon Growth Model (GGM), which assumes constant growth rates for the dividends in an indefinite time horizon must be applied (Gordon and Shapiro 1956).

$$V_0 = \frac{D_{t-1} * (1 + g)}{k_e - g} \; or \; V_0 = \frac{D_t}{k_e - g} \tag{8}$$

Where:
V_0 = Stock value at time 0
D_t = Expected dividend per share at time t (end of year pay-out)
k_e = Discount rate at the required rate of return on equity
g = Expected constant growth rate

Formula 8: Gordon growth model

If the growth rate is expected to be higher than the cost of equity, a two-stage DDM for an n-period investment horizon should be applied (Pinto et al. 2015).

$$V_0 = \sum_{t=1}^{\infty} \frac{D_t}{(1 + k_e)^t} + \frac{V_n}{(1 + k_e)^n} \tag{9}$$

Where:
V_0 = Stock value at time 0
D_t = Expected dividend per share in year t (end of year pay-out)
k_e = Discount rate at the required rate of return on equity
V_n = Terminal price per share in period n

Formula 9: Two-stage dividend discount model

2.2.2 Discounted Free Cash Flow Model

The DCF Model is the most popular approach among practitioners to estimate the firm value (Mukherjee et al. 2005). Two variations are defined in the following chapters.

2.2.2.1 Free Cash Flow to the Firm

The free cash flow to the firm (FCFF) is the available cash flow to the company's suppliers of capital after paying all operating expenses (including taxes), as well as investing in all necessary working and fixed capital (Pinto et al. 2015). It can be directly derived by summing the following items to the net income.

$$
\begin{array}{ll}
\textbf{\textit{Earnings before interest and tax (EBIT)}} & (10) \\
\textit{(-) Tax on EBIT} & \\
\hline
\textbf{\textit{= Net operating profit after taxes (NOPAT)}} & \\
\textit{(+) Depreciation} & \\
\textit{(+) Provisions} & \\
\textit{(+) Other non-cash charges} & \\
\textit{(-) Investments in net working capital} & \\
\textit{(-) Capital expenditures} & \\
\hline
\textbf{\textit{= Free cash flow from operations}} & \\
\textit{(+/-) Cash flow from non-operating activities} & \\
\hline
\textbf{\textit{= Free cash flow to the firm (FCFF)}} & \\
\hline
\end{array}
$$

Formula 10: Free Cash Flow to the Firm

The value of the firm can be calculated by discounting the free cash flows with the WACC (Pinto et al. 2015).

$$
Enterprise\ Value = \sum_{t=1}^{\infty} \frac{FCFF_t}{(1 + WACC)^t} \qquad (11)
$$

Where:
$FCFF_t = Free\ cash\ flow\ to\ the\ firm\ in\ period\ t$
$WACC = Weighted\ average\ cost\ of\ capital$

Formula 11: Discounted free cash flow to the firm

The FCFF has been established as the most widely used model in valuation practice. However, problems arise with changes in a firm's capital structure or exceptional investments where the APV (as explained in 2.2.3) shows its advantages (Luehrman 1997).

2.2.2.2 Free Cash Flow to Equity

The free cash flow to equity (FCFE) is the free cash flow available to equity holder after repaying all operating expenses, interest, and principal payments to all other capital suppliers and after investing in all necessary working and fixed capital. A way to calculate the FCFE is (Pinto et al. 2015).

(12)

Free Cash Flow to the Firm (FCFF)

(+) New debt issued

(-) Debt repayments

(+) Interest expenses ∗ (1 - tax rate)

= Free Cash Flow to Equity (FCFE)

Formula 12: Free cash flow to equity

In contrast to the FCFF approach, the value from an equity-holder's perspective can be derived by discounting the free cash flows with the cost of equity (Pinto et al. 2015).

$$Equity\ Value = \sum_{t=1}^{\infty} \frac{FCFE_t}{(1 + k_e)^t}$$

(13)

Where:
$FCFE_t = Free\ cash\ flow\ to\ equity\text{-}holders\ in\ period\ t$
$k_e = Discount\ rate$ at the required rate of return on equity

Formula 13: Discounted FCFE

Using the same assumptions, the FCFF approach (after deducting the non-equity claims) and the FCFE approach should result in the same equity value (Damodaran 2006).

However, the FCFF is the more common valuation method (Pinto 2015). Due to the fact, that PUMA's management does not signal any change in the capital structure, the FCFF is applied.

2.2.3 Adjusted Present Value

The adjusted present value model (APV) calculates the enterprise value as if the company is all-equity financed and adds the present value of tax shields (Myers 1974).

To compute the value of the unlevered firm, the expected FCFFs must be discounted by the unlevered cost of equity by using the unlevered beta, as explained in subsection 2.1.2.2. Under the assumption of a constant growth rate in perpetuity, the equation is the following (Damodaran 2011).

$$Value\ of\ unlevered\ firm = \frac{FCFF_0(1+g)}{k_e - g}$$

(14)

Where:
$FCFF_0 = Free\ cash\ flow\ to\ the\ firm$
$g = Expected\ growth\ rate$ of the firm
$k_e = Unlevered\ cost\ of\ equity$

Formula 14: Adjusted present value

The value of expected tax benefits is computed by the discounted value of a function of the tax rate, the cost of debt and the given level of debt. The discount rate equals the cost of debt (Koller et al. 2015). Other scholars suggest using the cost of assets as discount rate (Damodaran 2006). The tax shield is a benefit for the company due to the deduction of interest payments from the taxable income. Supposing that tax savings are a perpetuity, the value of the tax benefits is (Damodaran 2011).

$$Value\ of\ tax\ benefits = \frac{t_c * k_d * D}{k_d} = t_c * D$$

(15)

Where:
$t_c = Tax\ rate\ of\ company$
$k_d = Cost\ of\ debt$
$D = Market\ value\ of\ debt$

Formula 15: Value of tax benefits

It is not trivial to obtain the present value of expected bankruptcy costs, the product of probability of bankruptcy and bankruptcy costs. Damodaran (2011) prefers to estimate the probability of default by using bond ratings or a statistical approach based on company's observables. As a final step, the APV is calculated with the following formula.

$$APV = PV\ of\ unlevered\ firm + value\ of\ tax\ benefits \\ - PV\ of\ bankruptcy\ costs$$

(16)

Formula 16: APV - Sum of parts

The main drawback is the difficulty in estimating the average percentage of indirect bankruptcy costs on the value of the firm (Burgstahler et al. 1989). Even if the APV and the WACC are

different approaches to estimate the value of a firm by having a steady state, the results under the same assumptions should be equal. In an expanding company or when the debt to equity ratio changes, both approaches tend to have inconsistent results (Massari et al. 2008). Jaime (2008) points out which model should be applied. Using WACC is a more appropriate way, when valuing larger corporations in industrialized economies with a stable debt-to-equity ratio. The APV approach shows its advantages for smaller companies with a varying debt-to-equity ratio as well as for firms in countries with high economic uncertainties or a more complex tax legislation (Luehrman 1997). However, the DCF Model is the most popular approach among practitioners to estimate the firm value (Jaime 2008). Therefore, and because there are no signs for a change in capital structure of PUMA SE, the APV approach is not considered for the valuation.

2.2.4 Terminal Growth Rate and Terminal Value

The terminal growth rate is an important input factor for the terminal value that explains a major part of the estimated value (Pinto et al. 2015). For that reason, it is highly important to conclude an accurate forecast for the terminal growth rate. The growth of a company is projected until it ends up in a stable growth rate in perpetuity where the company is in a "steady state". A way to obtain the terminal value for the DCF model is the perpetuity growth model. The following equation represents the terminal value (Damodaran 2012).

$$Terminal\ Value = FCF_n * \frac{1 + g}{(r - g)} \tag{17}$$

Where:
$FCF_n = Unlevered\ free\ cash\ flow$
$n = Terminal\ year\ of\ the\ projection\ period$
$g = Growth\ rate$
$r = Discount\ rate$

Formula 17: Terminal value

Note that it is impractical to determine a terminal growth rate higher than the nominal gross domestic product (GDP). Due to its utmost importance, it is recommended to conduct model validations in the form of peer multiple valuations (Pinto et al. 2015).

2.2.5 Option Pricing Model (Real Options)

A contingent claim is a security of an asset that derives its value from another asset or an uncertain event. Real options are option based contingent claims computed by an option pricing tool such as the Black & Scholes model (Damodaran 2012; Paddock et al. 1988). It is therefore not necessary to forecast future cash flows including its discount rate. Real option valuation is mainly applicable to capital-intensive infrastructure investments (energy and power industry), research and development oriented companies, natural resource exploration and information technology projects (Kumar 2016). Since other valuation methods are more favorable for PUMA in practice, the option pricing model is not further described and is also not implemented for its equity valuation.

2.2.6 Asset-based valuation

The asset-based valuation obtains the net assets of a company by deducting the companies' liabilities from assets, based on their market values (Damodaran 2012). This method is often used in case of financial distress of companies. Because PUMA is in a stable condition, this method is not further specified.

2.2.7 Multiples / Relative Approach

The use of multiples in valuation is an indirect, marked-based valuation approach. The value of an asset is derived from a comparable asset or a synthetic peer group, which is priced and standardized using key statistics such as sales, EBIT, book value among others (Damodaran 2012). Multiples can be the basis of a company valuation or help to precise or validate the result of an intrinsic valuation method (Koller et al. 2005). The first and most critical step is to define an appropriate peer group that has similar characteristics in terms of a companies' business profile and financial profile. The greater the degree of similarity, the higher the precision of the provided results (Eberhart 2001). In efficient markets, results should be aligned with those of the DCF approach (Damodaran 2006). The second step is to scale the market price to an average key statistic to get a standardized price, as the scale or units may diverge. The third step is to modify certain standardized characteristics between the related assets. For example, companies with higher growth rates normally trade at higher multiple values than companies with lower growth rates (Damodaran 2006; Benninga and Sarig 1997). The most widely used multiples are price multiples and enterprise multiples, as shown below (Fernandez 2001).

Selection of the most commonly used multiples

P/E	Price-Earnings-ratio	**EV/EBITDA**	Enterprise value-to-EBITDA
P/CE	Price-to-Cash earnings	**EV/S**	Enterprise value-to-Sales
P/S	Price-to-Sales	**EV/FCF**	Enterprise value-to-Unlevered FCF
P/LFCF	Price-to-Levered free cash flow	**EV/BV**	Enterprise value-to-Book value
P/BV	Price-to-Book value	**EV/EG**	Enterprise value-to-EBITDA growth
P/AV	Price-to-Asset value		
PEG	Price earnings (PER) to growth		

Table 1: Overview of frequently used multiples

Price multiples are ratios of a share price in the market against the fundamental value per share of a comparable company. Enterprise value multiples include the total market value of all units of a firm's capital to the measure of the fundamental value of the company as a whole (Pinto et al. 2015). Advantages are, compared to other intrinsic valuation methods, that multiples are faster to apply and less assumptions must be undermined (Damodaran 2006). In addition, multiples are easier to understand and thus, more practical to present to customers (DeAngelo 1990). However, the simplicity itself can be a disadvantage when markets are mispriced. Furthermore, finding comparable companies with a similar business profile and financial profile may be an issue. But even with the same characteristics, different accounting policies can result in misinterpretation (Rosenbaum and Pearl 2009). The evidence for the accuracy of estimating the stock prices using multiples is contradicted, but a form of relative valuation is still used in almost 90 percent of equity valuations (Damodaran 2006). For the valuation of PUMA, the most commonly used multiples P/E, EV/Sales, EV/EBITDA and EV/EBIT are applied.

3 Global Economy Overview

PUMA is exposed to macroeconomic developments due to its global presence. The company's performance outcomes are dependent on external factors which are analyzed in this chapter.

In the second half of 2018, the global economy weakened noticeably. China changed its regulatory obstacles for shadow banks and trade tensions began to emerge with the US. The escalation of this trade dispute inhibits exposed emerging and developed economies. In Europe, uncertainties such as the Brexit negotiations harmed trade and consumption, new environmental regulations ceased the German automotive industry and rising sovereign spreads in Italy hampered investments. The effects of these events are carried into H1 2019 and should normalize in H2 2019. Trade tensions between the US and China are expected to ease, temporary problems in the Euro zone can be tackled and emerging markets, particularly Turkey and Argentina, are expected to stabilize. Moreover, lower taxes in the US and expanding public investments counterbalance instabilities. Nevertheless, economists expect the global economy to grow at a slightly lower pace, down from 3.6% in 2018 to 3.3% in 2019. The trend towards stabilization in H2 2019 is anticipated to continue, leading to a global growth of 3.6% in 2020 and around 3.5% beyond, as shown in *Figure* 1. (IMF 2019)
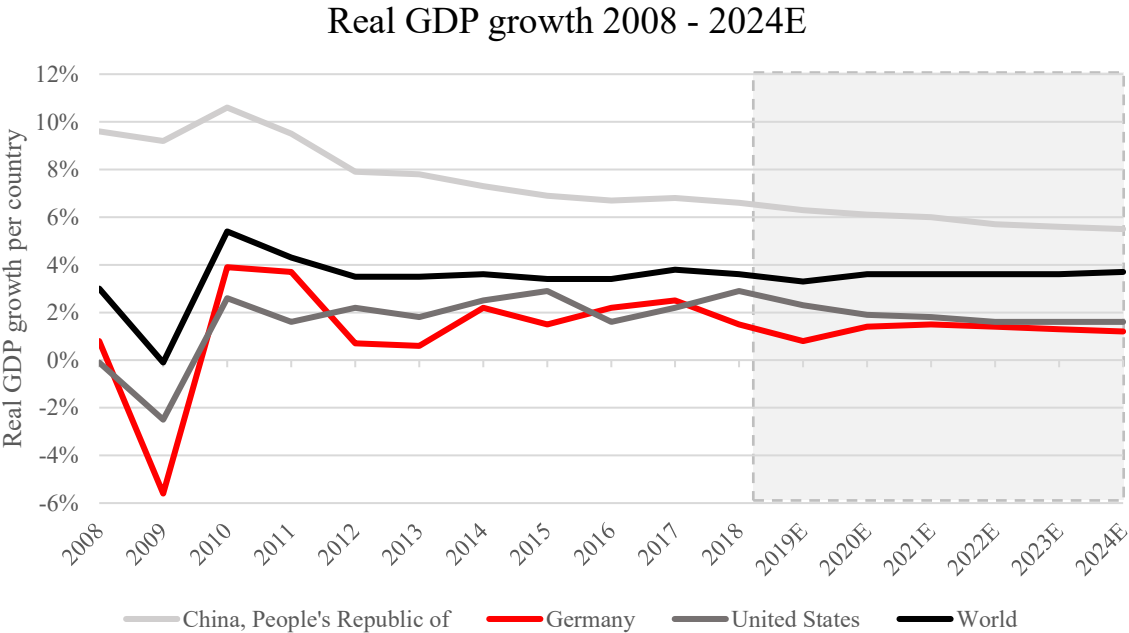
Figure 1: Real GDP growth 2008 - 2024E

World inflation rates are expected to remain constant with a trend to decrease slightly. Within a geographical breakdown, these inflation rates are used to calculate and predict the growth forecast based on nominal GDP developments.

Inflation rates 2008 - 2024E
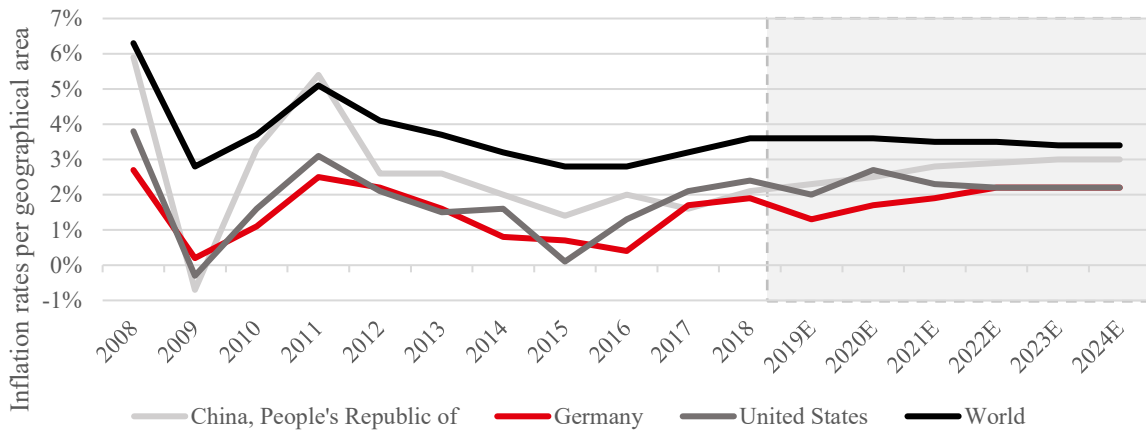
Figure 2: Inflation rates 2008 - 2024E

PUMA is exposed to currency fluctuations due to its worldwide sales and purchasing (97% of all products are sourced in Asia, where contracts are settled in USD). Since US and German inflation rates are expected to converge to a level of 2.2% in the long run, there is no need for exceptional adjustments for exchange rate risks, assuming that exchange differences are mainly explained by inflation. Beyond that, PUMA is hedging its exchange rate risks with currency forward contracts, accounted under the effective cash flow hedging principle of IAS 39 within the transition phase of IFRS 9.

Future risks are unpredictable consequences of trade tensions mentioned above, the uncertain Brexit result and sovereign yields in Italy that could spread to other European countries. After an upward trend in Q3 2016 the 10-year sovereign bond yields were decreasing again until Q2019, as presented in *Figure 3* (Federal Reserve Bank of St. Louis 2019).

10-Year sovereign bond yield average
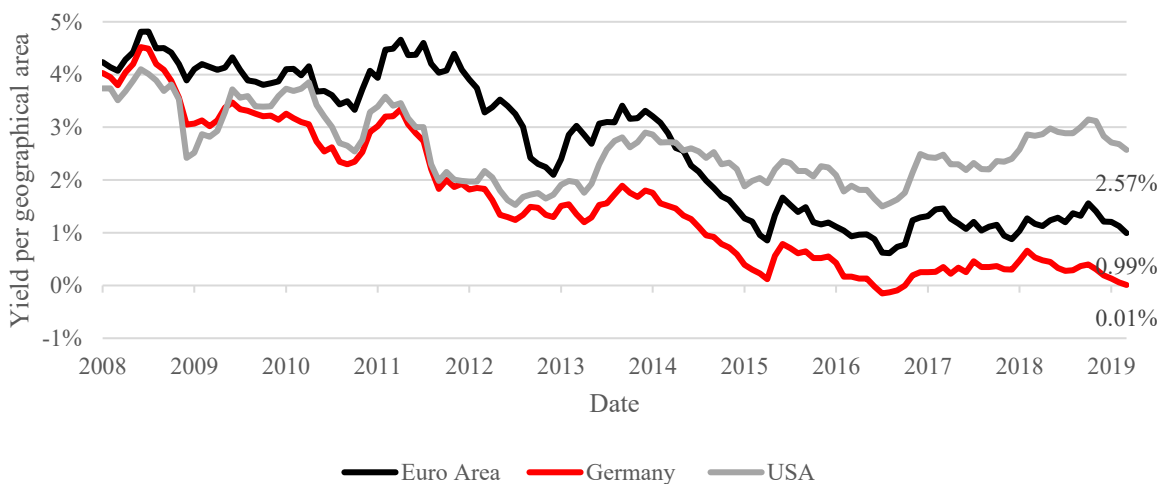
Figure 3: 10-Year sovereign bond yield average

Compared to past years, interest rates are at a low level with rising yields in the US. The US Federal Reserve signaled to stop interest rate increases for 2019. Other central banks such as ECB, Bank of Japan and Bank of England already moved to a more accommodative monetary police while China's central bank acts more expansionary due to the trade restrictions. A trend can be seen for the long-term interest rate estimation by the OECD, where US rates are rising significantly (IMF 2019; OECD 2019).
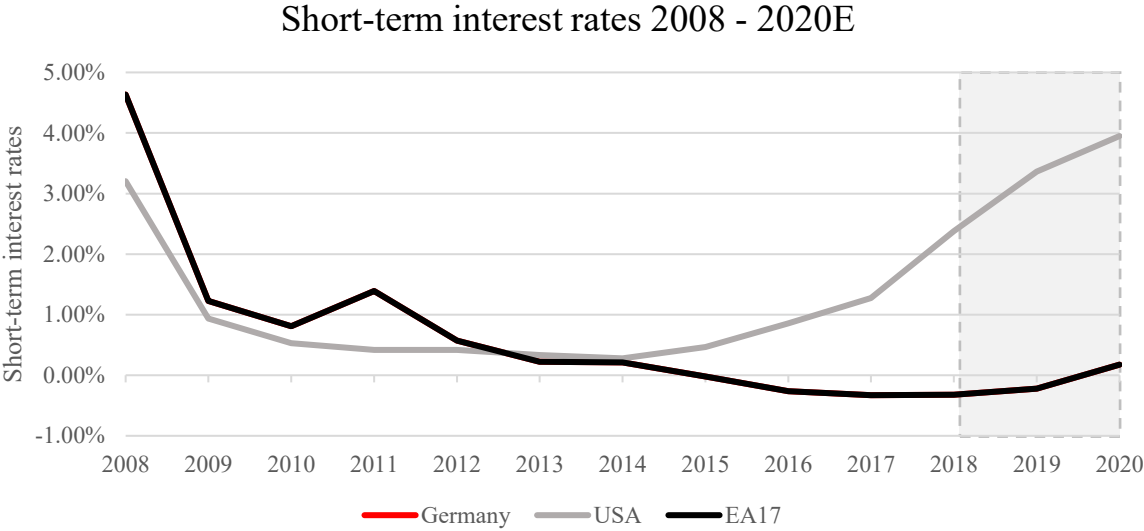
Figure 4: Short-term interest rates 2008 - 2020E

Figure 5: Long-term interest rates 2008 - 2020E

4 Industry Overview

As a producer and seller of sports footwear, apparel and accessories, PUMA's defined industry is the sportswear and sports equipment market.

The ten major players in the market include Nike, Inc., Adidas AG, VF Corporation, Puma SE, Under Armour Inc., Columbia Sportswear, Amer Sports Corporation, New Balance Inc., and ASICS Corporation. Among these competitors, Puma has a market share of 5.31%, as illustrated in below. A split of shares in the market is presented in the chart below (Thomson Reuters Eikon 2019).

Share of the largest sportswear and sports equipment producers by sales in 2018
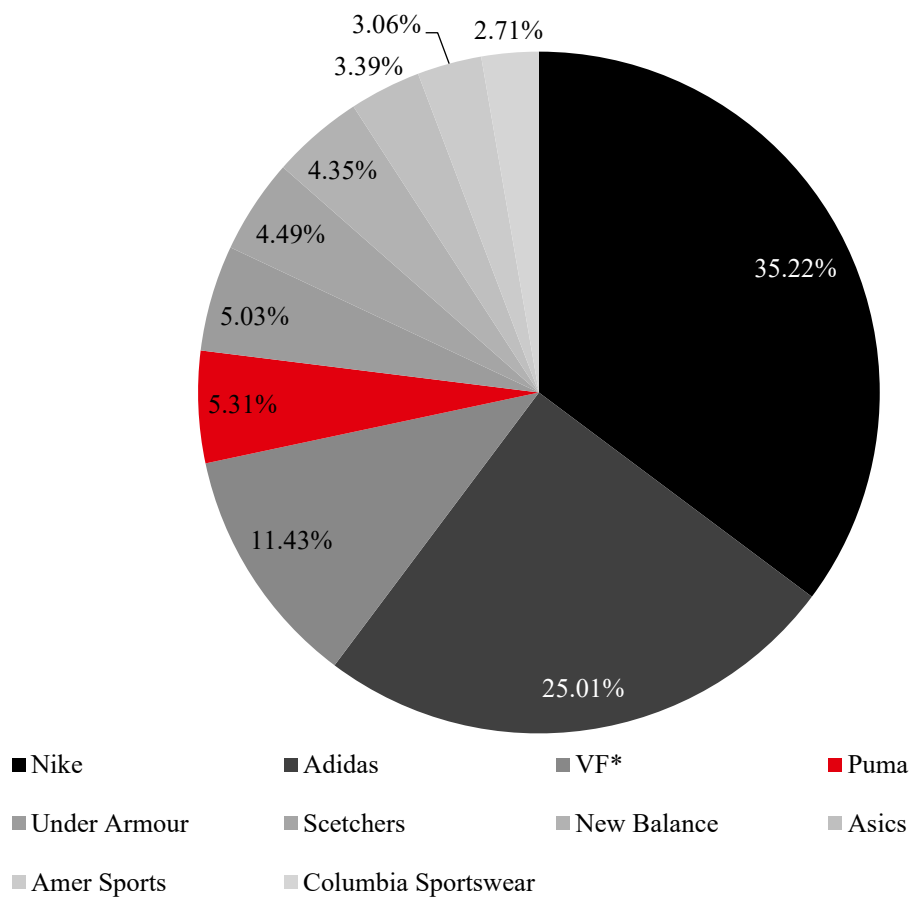
Figure 6: Market Share of the largest sportswear producers

Market share development among the 10 largest sportswear producers (Soruce: Reuters Eikon)							
Year	2012	2013	2014	2015	2016	2017	2018
Nike	32.8%	34.0%	34.7%	36.6%	36.4%	35.5%	35.2%
Adidas	26.9%	25.3%	24.1%	22.5%	23.0%	24.7%	25.0%
VF	15.3%	15.3%	14.8%	13.2%	12.4%	12.2%	11.4%
Puma	5.91%	5.32%	4.92%	4.50%	4.51%	4.82%	5.31%
Under Armour	2.6%	3.1%	3.9%	4.7%	5.4%	5.2%	5.0%
Skechers	2.2%	2.5%	3.0%	3.8%	4.0%	4.3%	4.5%
New Balance*	3.8%	4.0%	4.1%	4.3%	4.3%	4.0%	4.4%
Asics	4.4%	4.4%	4.1%	4.2%	4.1%	3.7%	3.4%
Amer Sports	3.7%	3.8%	3.7%	3.4%	3.3%	3.0%	3.1%
Columbia Sportswear	2.3%	2.3%	2.6%	2.8%	2.7%	2.5%	2.7%
TOTAL (in €m)	71.093	74.543	80.026	83.508	88.991	96.744	103.337

*Estimates (private company)

Table 2: Market share development among the 10 largest sportswear producers

The sporting industry is rapidly evolving due to emerging sports technologies and changing trends among the society. Sporting items are discretionary goods. Main growth factor is an increasing health awareness among the population resulting in higher mass sports activities. Large sports events such as the 2018 FIFA World Cup or the Olympic Games are drivers for the sports market success. Public institutions allocating funds for healthcare initiatives, improving the sports infrastructure and organizing sport events to spark awareness of the importance of exercise. Trends to use sportswear as casual fashion boost the sportswear market heavily. Moreover, advanced material manufacturing leads to higher adoption rates for customers. More convenient e-commerce and m-commerce distribution channels enhance the willingness to buy sportswear. Additionally, increasing wealth standards in emerging markets enabled people to spend more on leisure activities (Grand View Research 2018, 2018).

However, increased distribution and predilection for indoor activities, such as video games, virtual reality, movies or smartphone usage restrains market growth. (Allied Market Research 2018). Additionally, increasing prices for products have negative impacts on sales. Lastly, counterfeit products harm the sales for brands (Marketline 2019, 2019).

Buyer`s power is moderate in the sports equipment market, especially for strong brands that can sell their products exclusively in their stores. In this case, switching costs are not negligible unless the buyer is satisfied with a substitute product (Marketline 2019). Supplier power varies

in the sports equipment market, especially for strong brands. Here, retailers cannot afford to stock up their products (Marketline 2019). The size of the sportswear market is estimated at $300.2bn in 2017, divided into various subcategories (Euromonitor International 2018).

Market size and segment overview in 2018
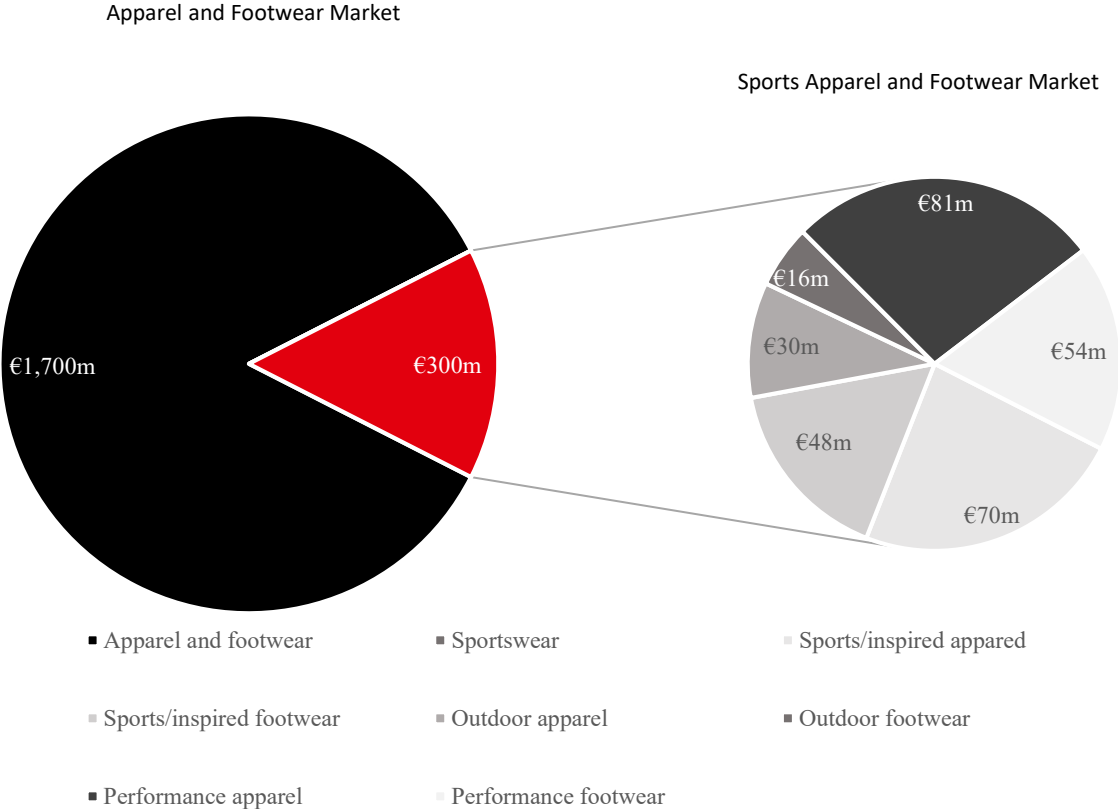
Source: Euromonitor, 2018

Figure 7: Market size and segment overview

Outlook and Trends

The largest market is currently in North America, accounting for about 35.5% whereas the Asian Pacific market is the fastest growing market, with an expected 8.4% compound annual growth rate (CAGR) due to increasing wealth and health awareness. The following graph illustrates the regional historical and expected growth rates for sports market industry (Euromonitor International 2018).

Market growth by region

Source: Euromonitor, 2018 ■ CAGR (2017-2012) ■ CAGR (2022-2017)
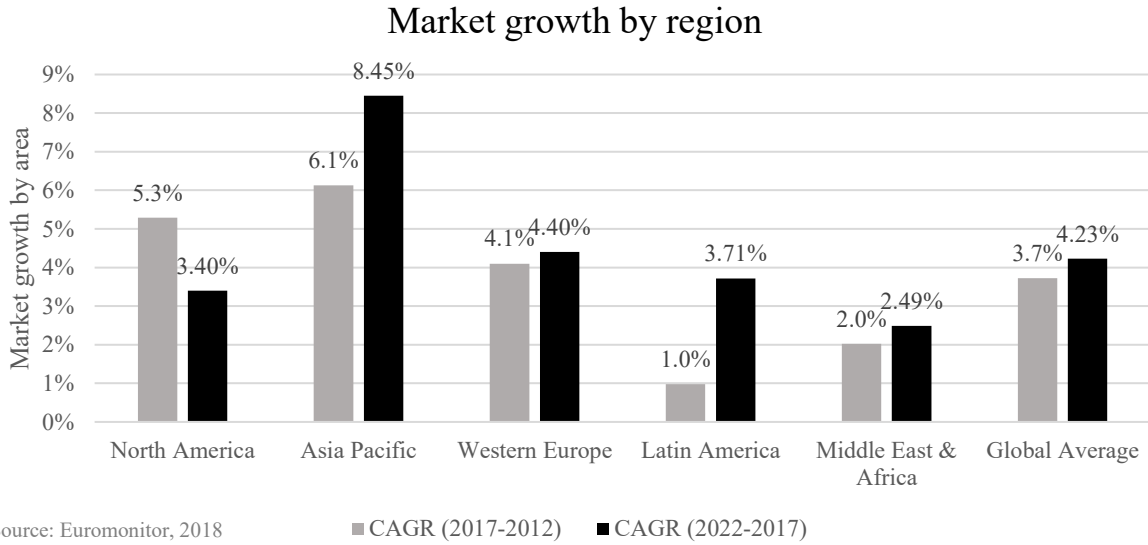
Figure 9: Market growth by region

Global sportswear market vs. real GDP, %Y-o-Y change

■ Sportswear growth ■ real GDP growth — Multiplier
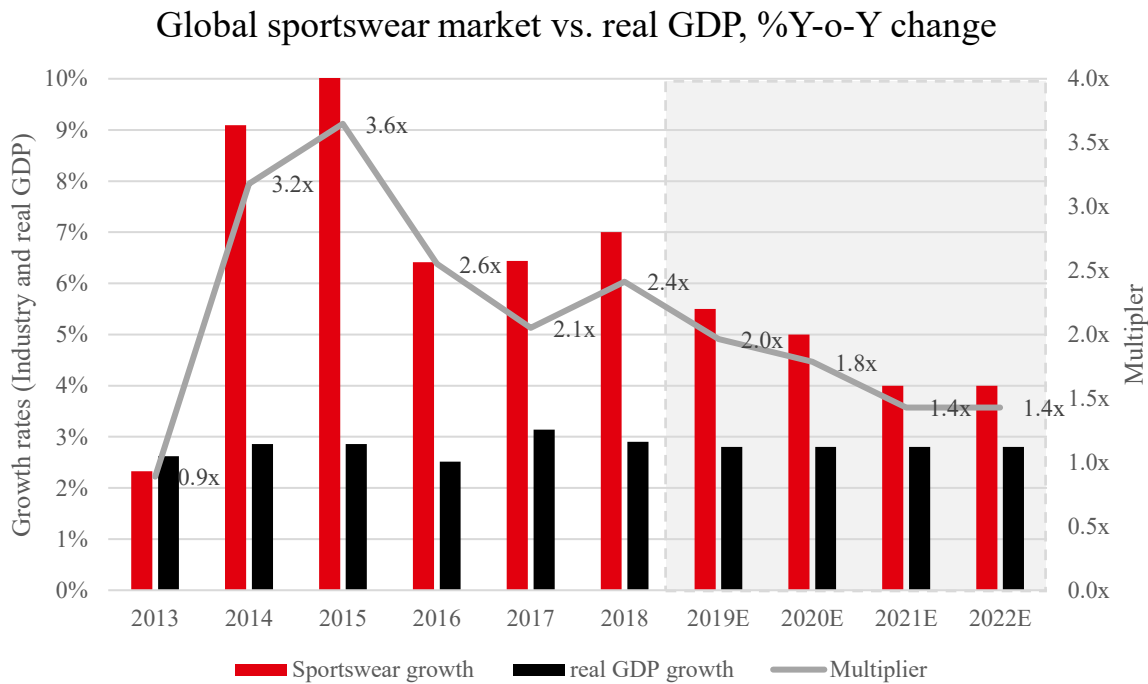
Figure 8: Global sportswear market

Industry experts estimate the segment ball games including football or basketball to post the highest growth until 2025. In China, Badminton and basketball are the most popular sports (Euromonitor International 2018; Research and Markets 2018). In the last five years, the sportswear market demonstrate on average growth rates of more than twice than the global real GDP (Euromonitor International 2018; The World Bank 2019).

The expected CAGR for the global sportswear market is forecasted at 4% until 2022, compared with 2% for the wider fashion industry. While the US is still the main driver for the market with a value growth of $19bn over 2017-2022, the rising key markets are China and India accounting for a combined value growth of $23bn. The sports market is rapidly adapting new technologies such as big data, wearables or sensors for health measurements. New market entries in the sports equipment market is only possible for niche markets focusing on e-retailing to compete against the large players. Another trend is the sustainable fashion through environmental friendly re-sources and production (Euromonitor International 2018; PUMA SE 2019b).

5   Company Overview

PUMA at a Glance[2]

PUMA was founded in 1948 and has its headquarters in Herzogenaurach, Germany. The company is listed on the German MDAX and operates as a European Corporation (SE) under the chief executive officer (CEO) Bjørn Gulden. The company is involved in designing, developing, and distributing the segments footwear, apparel and accessories in the sports industry.

Product Line

PUMA´s product line includes sports performance and sportstyle products across six business units: Teamsport, Running, Training, Golf, Motorsport, Sportstyle and Licensing. PUMA distinguishes between Footwear, Apparel and Accessories. The following figures show the contribution of each segment to total revenues and the development of revenues per product segment.

Revenue split by segments in FY18

Figure 10: Revenue split by segment

Revenues across segments
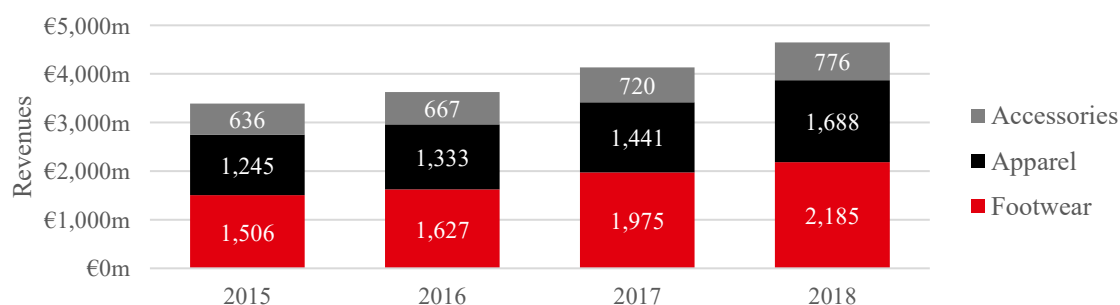
Figure 11: Sales across segments

While footwear represents the largest share in terms of sales, the highest growth segment is apparels with 17.1% compared to footwear and accessories with 10.6% and 7.8%, respectively.

Geographic Mix

PUMA reports its sales as groups of EMEA (39%), Americas (35%) and Asia/Pacific (APAC) (26%). While in 2018 EMEA and Americas have the largest market shares, the Asia/Pacific area has the highest growth rate with 24.2% compared to 9.4% in EMEA and 7.9% in Americas, measured in reporting currency. Figure 12 – Figure 14 give an overview of the sales by geography.
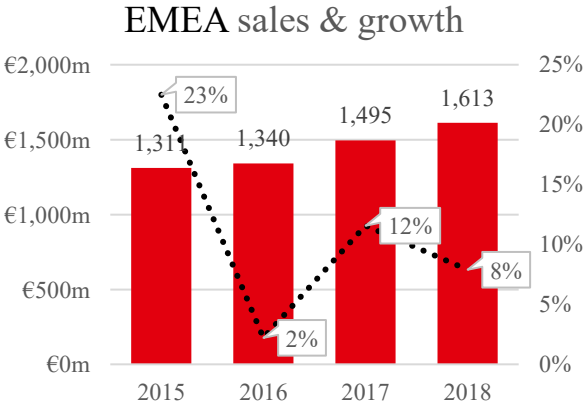
Figure 12: EMEA sales & growth
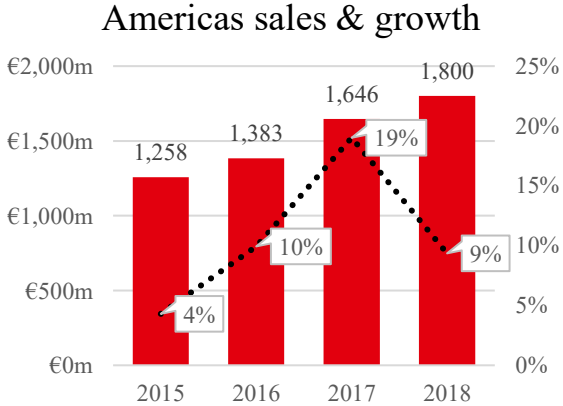
Figure 13: Americas sales & growth
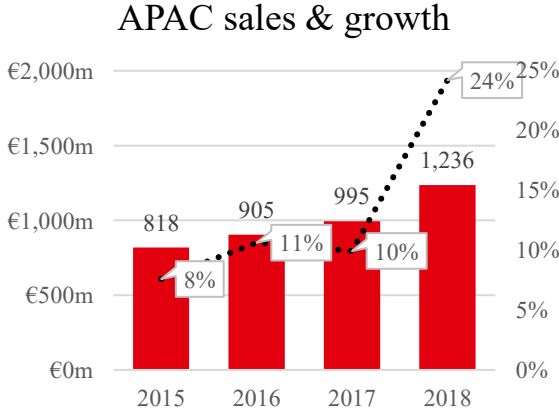
Figure 14: APAC sales & growth

Distribution Channels

The distribution channels of its brands PUMA and COBRA Golf are operated through whole-sale (76%) and direct sales (24%) in its own retail stores and online stores.

Distribution channel mix by revenue in FY18

24% growth in direct sales FY18

24%

76%

16% growth in wholesale FY18

■ Wholesale ■ Direct sales
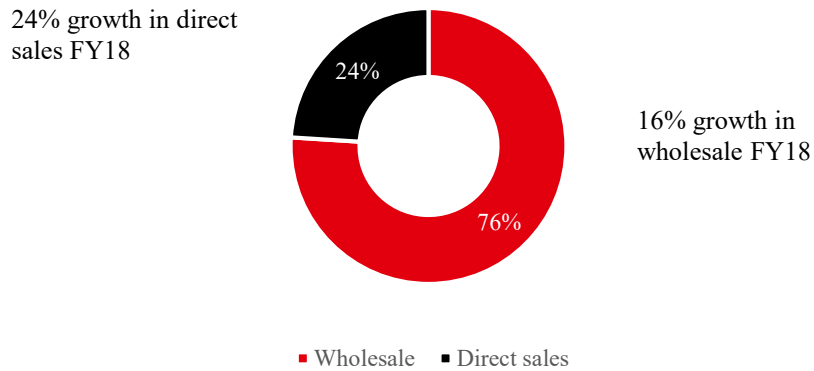
Figure 15: Distribution channel mix

Around 120 countries are within PUMA`s distribution scope. The sourcing organization col-laborates with a worldwide network of independent manufacturers. PUMA's major sourcing area from production and transport to distribution is based in Asia.

Sourcing regions of PUMA in % of unit production

EMEA
3%

Americas
3%

Asia/Pacific
94%

■ Asia/Pacific ■ EMEA ■ Americas

Powered by Bing
© GeoNames, HERE, MSFT, Microsoft, NavInfo, Thinkware Extract, Wikipedia
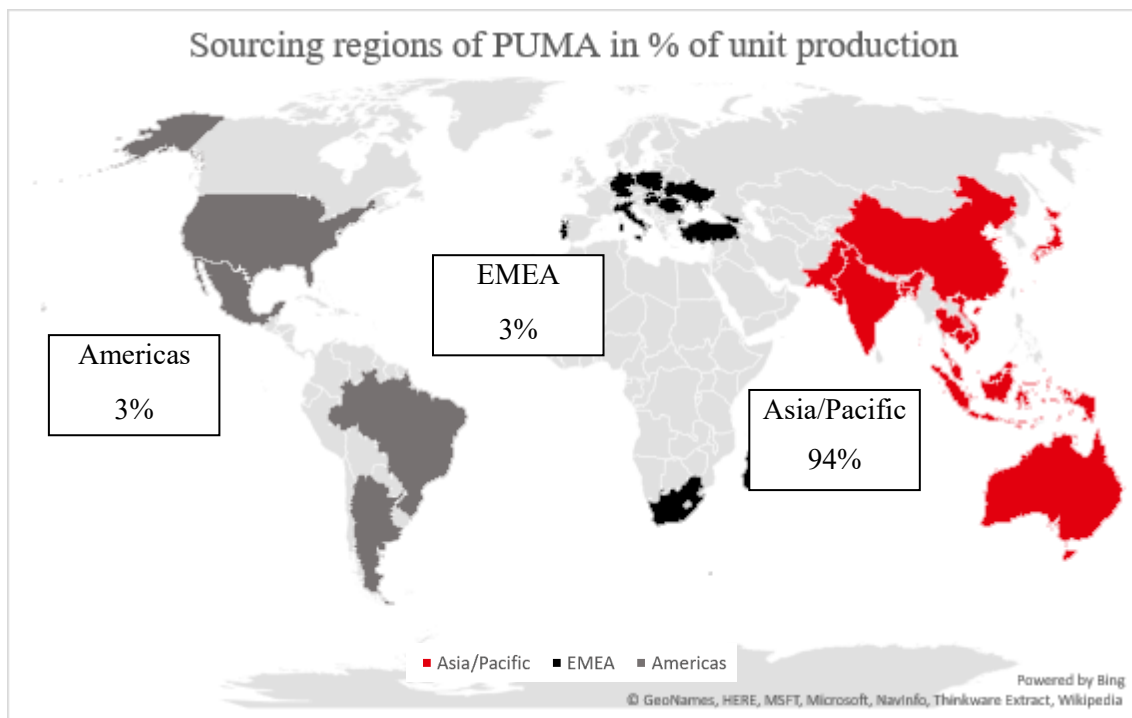
Figure 16: Sourcing regions of PUMA in % of unit production in FY18.

Due to this concentration of sourcing, various factors like third party manufacturers, exchange rate, fluctuations, tax changes, trade restrictions or political instability represents a risk.

However, PUMA's management is confident to be prepared for potential negative developments through global diversification and alternative scenario planning in case of occurring events. Cross-currency risks of the large exposure of contracts denominated in US Dollar through its product sourcing in Asia are hedged with forward contracts.

Strategy

PUMA's mission statement "Forever Faster" from 2014 was created to become the "world's fastest sports brand" and to enable full potential for athletes while expressing their personality and style. Beyond that, the philosophy is valid for the whole product cycle from fast-decision making to production to distribution while ensuring a quick adaption of market trends. The most famous strategic partner to follow these goals is the world record sprinter Usain Bolt. The year 2014 was the year of change and the company followed a strong financial development and a great improvement of their brand awareness. For fiscal year 2019 (FY19) to fiscal year 2021 (FY21), PUMA`s main strategic goals are building a comprehensive offer for women and reentering and establishing the basketball market.

Sponsorships

The sponsorship of sports teams and professional athletes is essential for sportswear distributers like PUMA to create a strong brand positioning. PUMA has a mix of sponsoring for athletes, entertainers and professional sports teams. The most famous brand ambassadors are Usain Bolt, Lewis Hamilton, Antoine Griezmann, Rihanna, Selena Gomez and the football teams Arsenal London, Borussia Dortmund, AC Milan and the National Team of Italy, as illustrated below.
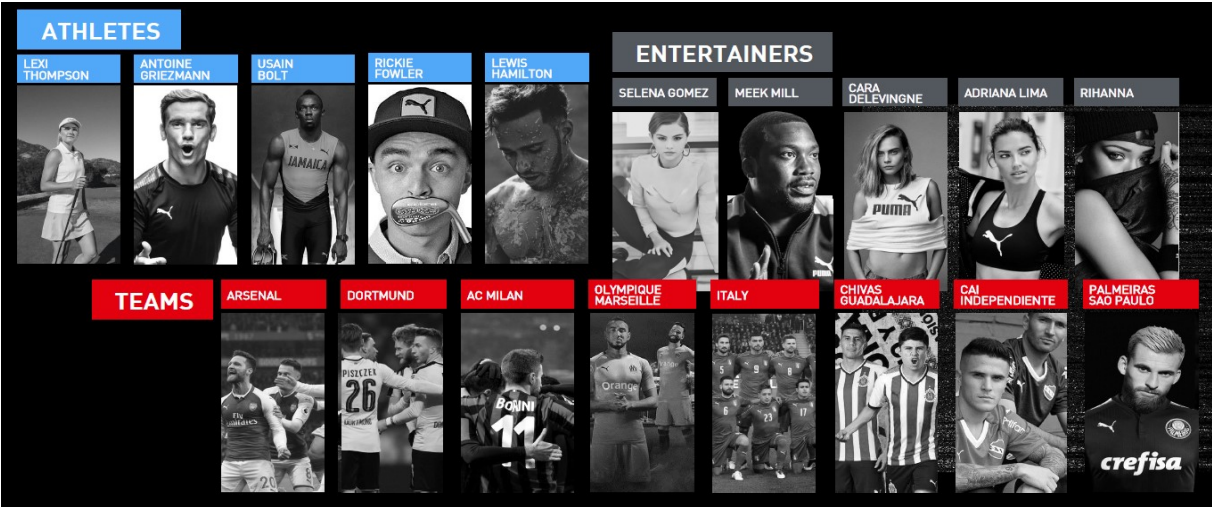
Figure 17: Sponsorships (a)

Figure 18: Sponsorships (b)

Sustainability

Sustainability gains importance in todays' global society. PUMA has set goals for 10 of the 20 United Nations sustainable development goals:

Figure 19: Sustainability goals

In March 2019, PUMA announced the launch of a sustainable sportswear collection in collaboration with *First Mile* by using yearn from recycled plastic bottles (PUMA SE 2019a). In April 2019, PUMA finalized its ambitious goals to use 90% sustainable down feathers, leather, cotton and polyester by 2020 with a cooperation of *Responsible Down Standards, Leather Working Group*, *Better Cotton Initiative* and *bluesign* (PUMA SE 2019c). PUMA

proclaimed that it reached its previous target of 50% sustainability two years ahead of schedule (PUMA SE 4/23/2019).

Social Media

Social media presence is gaining importance as a key driver of growing brand heat through influencer and ambassadors and thus, to create demand for its products (Aral et al. 2013). Puma has 9.6m Instagram followers with a significant growth of 51% since 1 January 2018 and 20.1m follower on Facebook with a growth of 6% (Trackalytics 2019).
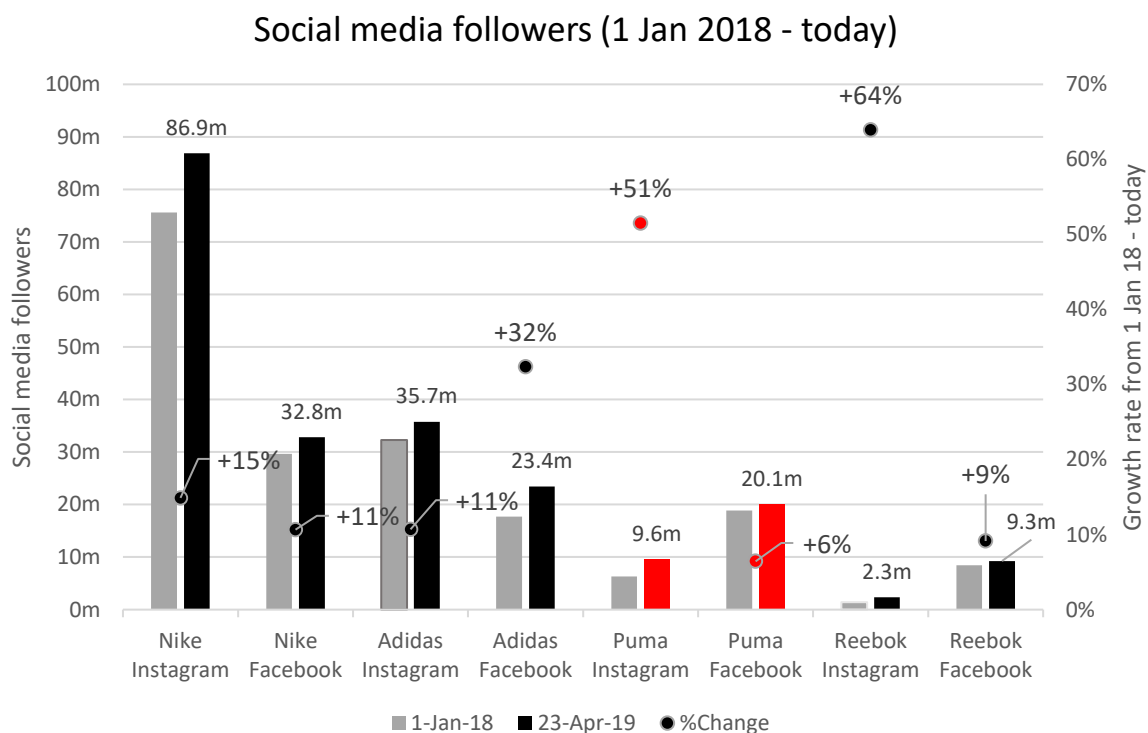
Figure 20: Social media followers

This comparison demonstrates a competitive disadvantage against its main competitors Nike and Adidas in terms of social media awareness and advertising power. Against its smaller competitor Reebok that belongs to Nike, PUMA is superior. In recent years, Puma has become a skillful player on social media, generating brand awareness and product demand through its marketing campaigns.

Key Financials

in € m	2014	2015	2016	2017	2018	Trend
Sales	2972.0	3387.4	3626.7	4135.9	4648.3	
% growth	*3.30%*	*14.0%*	*7.1%*	*14.0%*	*12.4%*	
Gross Profit	1,385.4	1,540.2	1,656.4	1,954.4	2,249.3	
% sales	*46.6%*	*45.5%*	*45.7%*	*47.3%*	*48.4%*	
EBITDA	185.8	153.7	187.5	314.9	419.3	
% sales	*6.3%*	*4.5%*	*5.2%*	*7.6%*	*9.0%*	
EBIT	128.0	96.2	127.6	244.6	337.2	
% sales	*4.3%*	*2.8%*	*3.5%*	*5.9%*	*7.3%*	
Net Income	64.1	37.1	62.4	135.7	187.3	
% sales	*2.2%*	*1.1%*	*1.7%*	*3.3%*	*4.0%*	

Table 3: Key financial figures

In 2018, PUMA generated a currency adjusted sales increase of 12.4% to €4,648m (17.6% organic growth). The gross profit margin improved by 110 basis points to 48.4%. Its operating expenses increased by 11.8% to €1,928m while the cost-to-sales ratio improved from 41.7% to 41.5%. 75% of the marketing budget was spent for sports and 25% for lifestyle.[3] Net earnings increased by 38% from €135.8m to €187.4m with earnings per share from €9.09 to €12.54. The operating margin improved from 5.9% (€245m) in FY17 to 7.3% (€337m) in FY18.
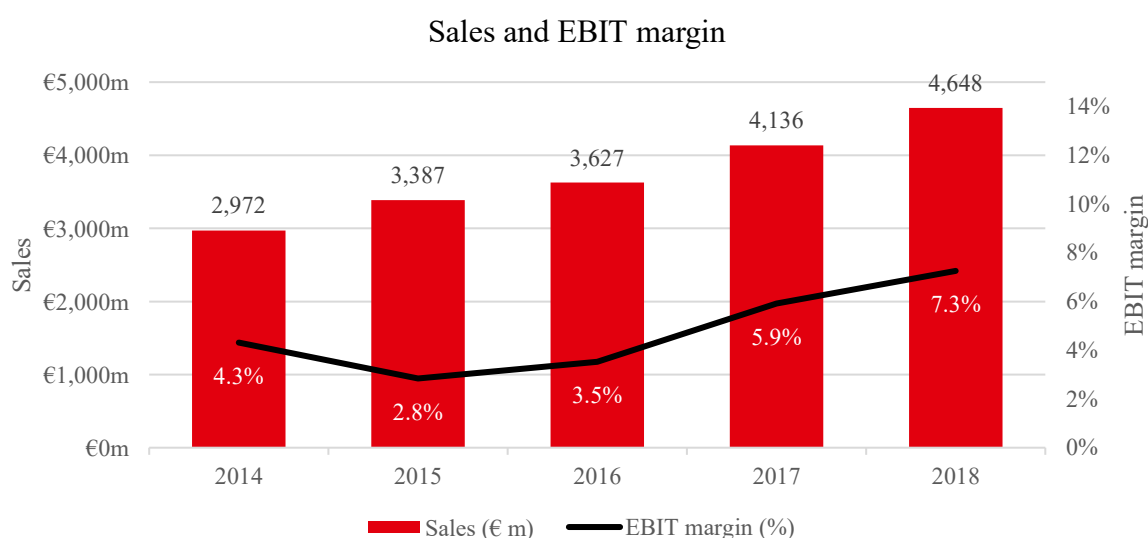
Figure 21: Sales and EBIT margin

---

[3] Information provided by PUMA's investor conference in February 2019.

Employees

The company employed in FY18 on average 12,192 people compared to 11,389 in FY17, mainly due to the increased number of retail stores. The productivity per employee increased, measured relation of EBIT/FTE and Sales/FTE in the past years.
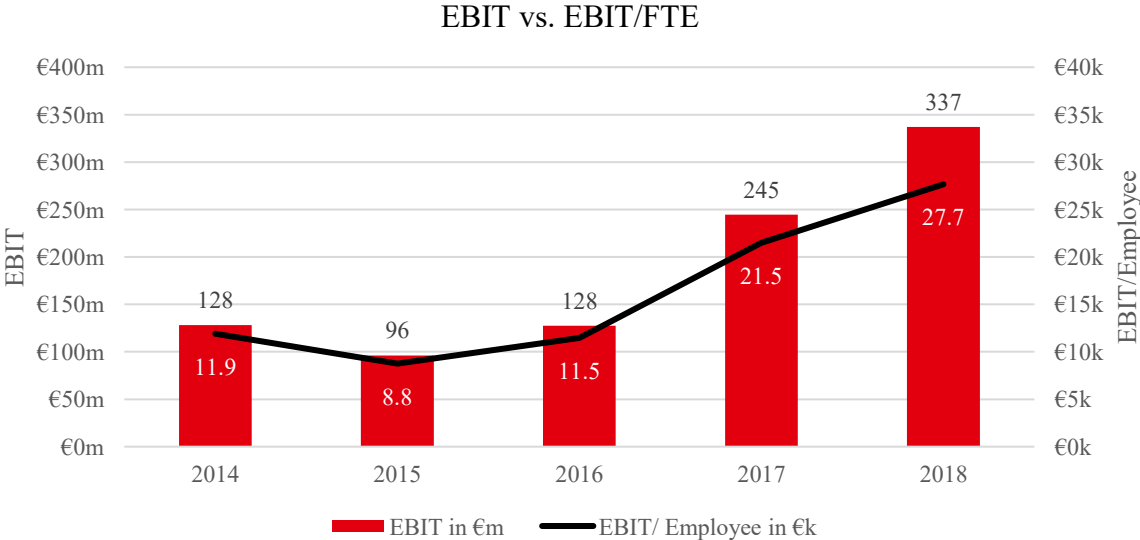
Figure 22: EBIT vs. EBIT/FTE
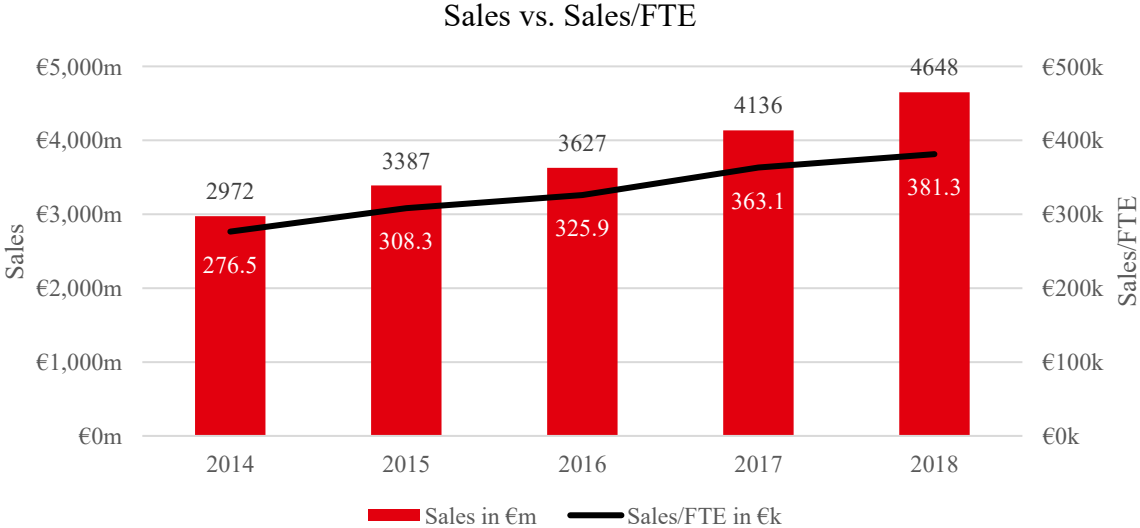
Figure 23: Sales vs. Sales/FTE

PUMA Shares

As of 31 December 2018, Puma has a market capitalization of €6.4bn. The share price development of the last 5 years is visualized below with a current share price of €544.50 on 18 April 2019 and €427.00 on 31 December 2018. The 5-year high is €544.50 (current) and 5-year low was at €142.45. In the past 5 years, PUMA outperformed its index, the MDAX. By looking at the last 3 years, PUMA's share outperformed the MDAX as well as its main competitors Adidas and Nike. The following graphs illustrate the share price development of PUMA and comparing the quote history with competitors and the index MDAX.
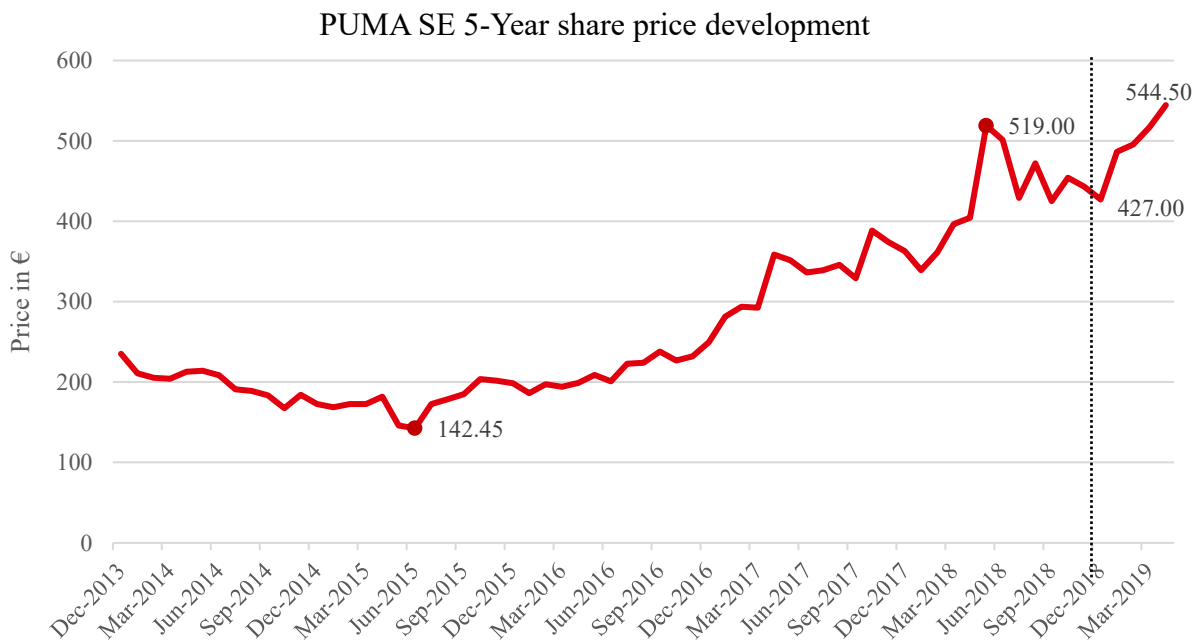
Figure 24: PUMA SE 5-year share price development

The following graphs demonstrate the strong performance of PUMA during the past years. In the last 5 years, PUMA was only outperformed by Adidas. In the last 3 years, PUMA´s stock outperformed Adidas, Nike and the MDAX almost constantly.

PUMA SE 5-Year share price development compared to index
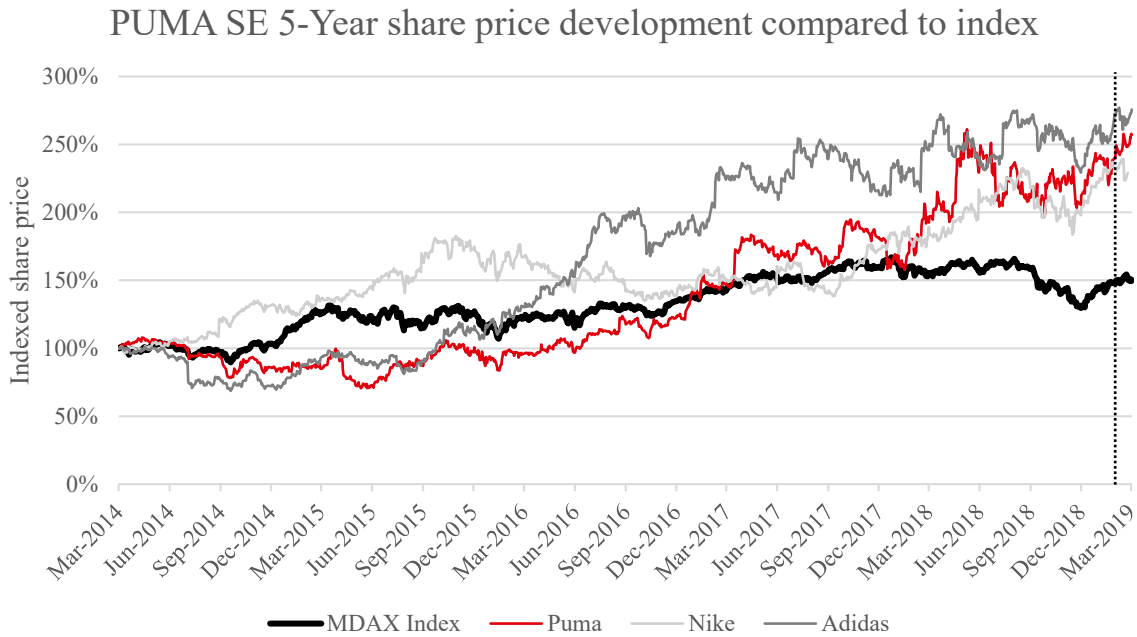
Figure 25: PUMA SE 5-year share price development compared to the MDAX index

PUMA SE 3-year share price development compared to index
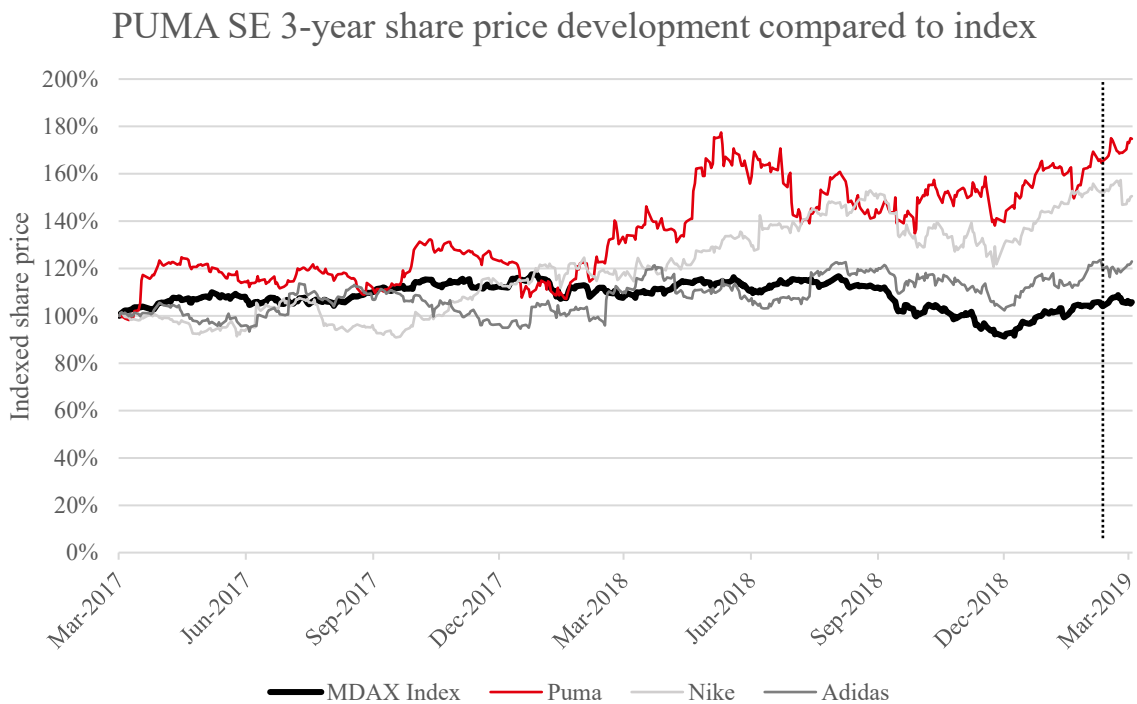
Figure 26: PUMA SE 3-year share price development compared to the MDAX index

In the annual general meeting, the management proposed a dividend of € 3.50 per share for 2018, which is equal to a payout ratio of 27.9%. For 2017, a one-time special dividend was paid as a result of business improvements and to value Kerings' collaborative effort (PUMA SE 2018).
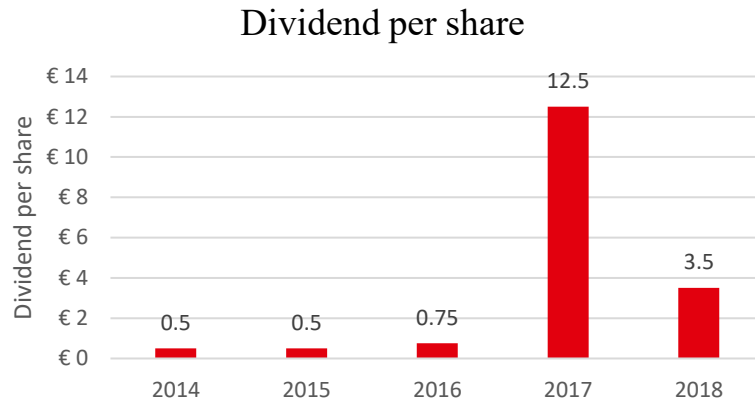
Dividend per share

Figure 27: Dividend per share

Ownership structure

In May 2018, PUMA's majority shareholder, Kering S.A., reduced its share from 86% to 16% as dividend in kind to its shareholders. The reason behind this strategical decision was to fully focus on luxury brands and to offset its "imbalance" and "to avoid a drawn-out disposal of Puma to a third party", according to Kering's management (Reuters 2018a). For CEO Gulden, this deal was the "best option" Reuters (2018b). Artemis, holder of 40.9% of Kering's shares becomes strategic shareholder with 28.54% ownership. As a result, the public float increased from 13% to 55%. With this new ownership structure, PUMA returned to the German MDAX in June 2018.

Ownership structure in FY18
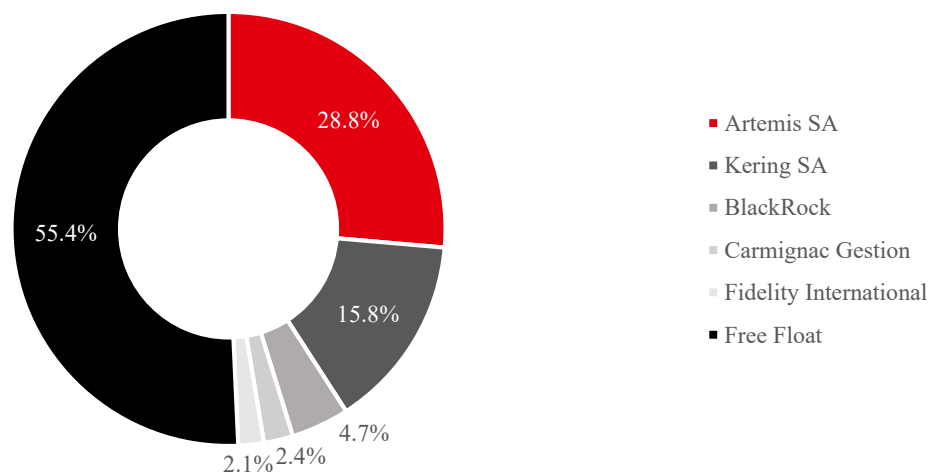
Figure 28: Ownership structure

6   DCF Valuation

The DCF valuation is the most appropriate intrinsic valuation method for PUMA. There is no need for applying the APV model because the company structure is expected to maintain constant and no exceptional projects are planned. The DCF is computed with the FCFF approach for PUMA SE by the date of 31 December 2018 on basis of the annual report as of 13 February 2019. The explicit period for the financial forecast ranges until FY27 where the company is expected to be in steady state. Thus, the terminal value is expressed in FY28.

6.1   Financial Forecast - Income Statement

Revenues

In the last five periods, PUMA´s growth outpaced the sports apparel market as well as the global nominal GDP. This trend is expected to continue by gaining market shares and expanding to emerging markets, mainly in Asia. The revenue is forecasted by means of the sportswear market and PUMA´s historical performance within this market. Data from historical and expected growth rates for the sportswear market are provided by Statista (2017). From historical growth rates in the sportswear market with a CAGR of 3.87% (FY14-FY18), compared to PUMA's revenue growth rates, a multiplier as proxy for the future growth rates is created. The results of the turnaround started to take effect in FY15 and thus, given a floor level of zero in year FY14 due to the negative growth. The estimated market growth for the industry with CAGR of 3.93% is then used to forecast PUMA's sales growth until FY22 to receive a feasible estimate. From FY23 to FY27, it is assumed that PUMA's growth converges with the industry, ending up in a perpetuity growth rate of 2.20% in FY27 as explained in subchapter 6.4. As a result, PUMA is expected to grow with a CAGR in FY18-FY23 at 9.9% and a CAGR FY18-27 at 7.52%.
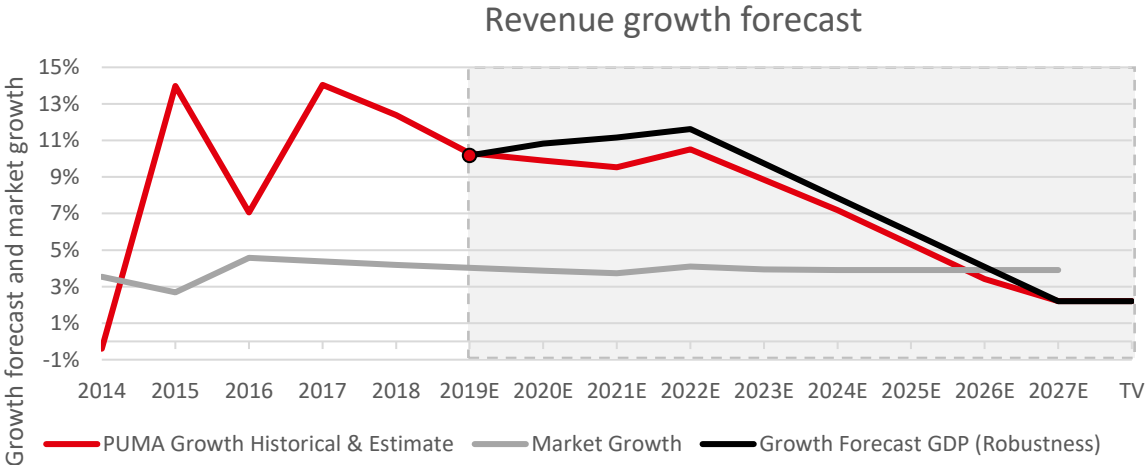
Figure 29: Revenue growth forecast

Forecast Summary	Historical					Forecast										Multiplier
	2014	2015	2016	2017	2018	2019E	2020E	2021E	2022E	2023E	2024E	2025E	2026E	2027E	TV	
PUMA Growth Historical & Estimat	-0.40%	13.98%	7.06%	14.04%	12.39%	10.39%	9.99%	9.62%	10.60%	8.92%	7.24%	5.30%	3.41%	2.20%	2.20%	
Market Growth	3.55%	2.68%	4.58%	4.38%	4.19%	4.02%	3.87%	3.72%	4.10%	3.94%	3.90%	3.90%				
Multiplier	*0.00*	*5.21*	*1.54*	*3.21*	*2.96*	*2.58*	*2.58*	*2.58*	*2.58*							2.58
Growth Forecast Industry	*-0.40%*	*13.98%*	*7.06%*	*14.04%*	*12.39%*	**10.39%**	**9.99%**	**9.62%**	**10.60%**	**8.92%**	**7.24%**	**5.30%**	**3.41%**	**2.20%**	**2.20%**	
Robustness Check																
Nominal GDP	3.52%	3.37%	2.88%	4.37%	4.59%	4.41%	4.69%	4.83%	5.03%	5.01%						
Multiplier GDP	0.00	4.14	2.46	3.21	2.70	2.50	2.50	2.50	2.50	2.50						2.50
Growth Forecast GDP (Robustness)						11.03%	11.74%	12.10%	12.60%	10.52%	8.44%	6.36%	4.28%	2.20%	2.20%	
Management Case						10.0%	10.0%	10.0%	10.0%							

Table 4: Revenue growth forecast summary

To check validity, and to proof if the forecast is reasonable, the historical performance was tested against the historical weighted nominal GDP data. Revenues are then forecasted with the same methodology, resulting in a 1.3 percentage points higher CAGR estimation from FY19-FY27, proofing a justifiable result. The calculation of the nominal GDP forecast is stated in Appendix 6. PUMA takes momentum from its ongoing success of the past years based on wide-ranging strategic changes in FY14. This is reflected by means of regaining market share, where PUMA dominates with 11% and 13% in FY17 and FY18, respectively. Additional gains in market share in the mid-term are expected. PUMA´s management, which is known for conservative estimations, expects a CAGR from FY19 to FY21/22 at around 10%. Furthermore, consensus estimates CAGR until FY21 at a 10% level. The following graph summarizes the estimation metrics.

The forecasts for FX adjusted revenues and growth rates are summarized in the graph below:

Sales development and growth rates
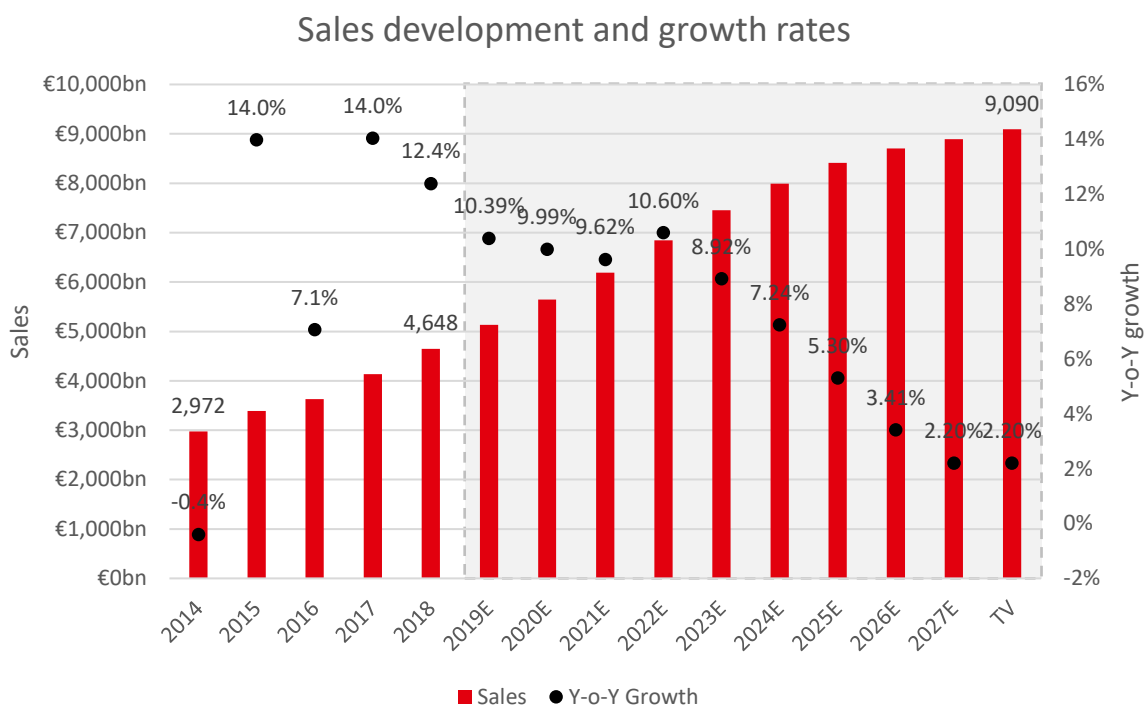
Figure 30: Sales development and growth rates

Cost Structure

Costs are split up in costs of sales and operating expenses. To improve its gross margin, PUMA applied changes in sourcing, which led to improvements in the cost of sales. Even under the pressure of higher labor costs in Asian markets, where 94% of all products are sourced, there is a chance to further improve its cost ratio considering a higher efficiency of sourcing, product costs and product return claims. Coming from a high cost of sales / sales ratio, the best proxy is to forecast with the last year cost of sales / sales ratio at 51.6% with adjusted rates until FY21, normalizing until FY24 with returning to the constant ratio of FY18. Adjustments are a result of management information and validated by a stronger performance of competitors.

Main drivers for operating expenses are sales and distribution expenses which sums up in SG&A. Even though a higher efficiency in distribution networks was achieved due to improving e-commerce systems, operating expenses are expected to grow along with the ratio of sales. Main drivers are marketing expenses that are associated with the sponsorship of sports teams and celebrities to maintain and increase PUMA's brand recognition. For those reasons, an average ratio of sales for all SG&A items of the last three years were utilized to forecast SG&A and other operating expenses.

Under the same principle, R&D expenses are forecasted. Other operating income is kept constant due to eventual non-recurring events in the past. As a result, this leads to a constant ratio to revenues. The cost structure in relation to sales is illustrated in the following graph:[4]

---

[4] Royalty & other revenues as well as D&A are not included in the total operating income and expenses that are not presented in the table.
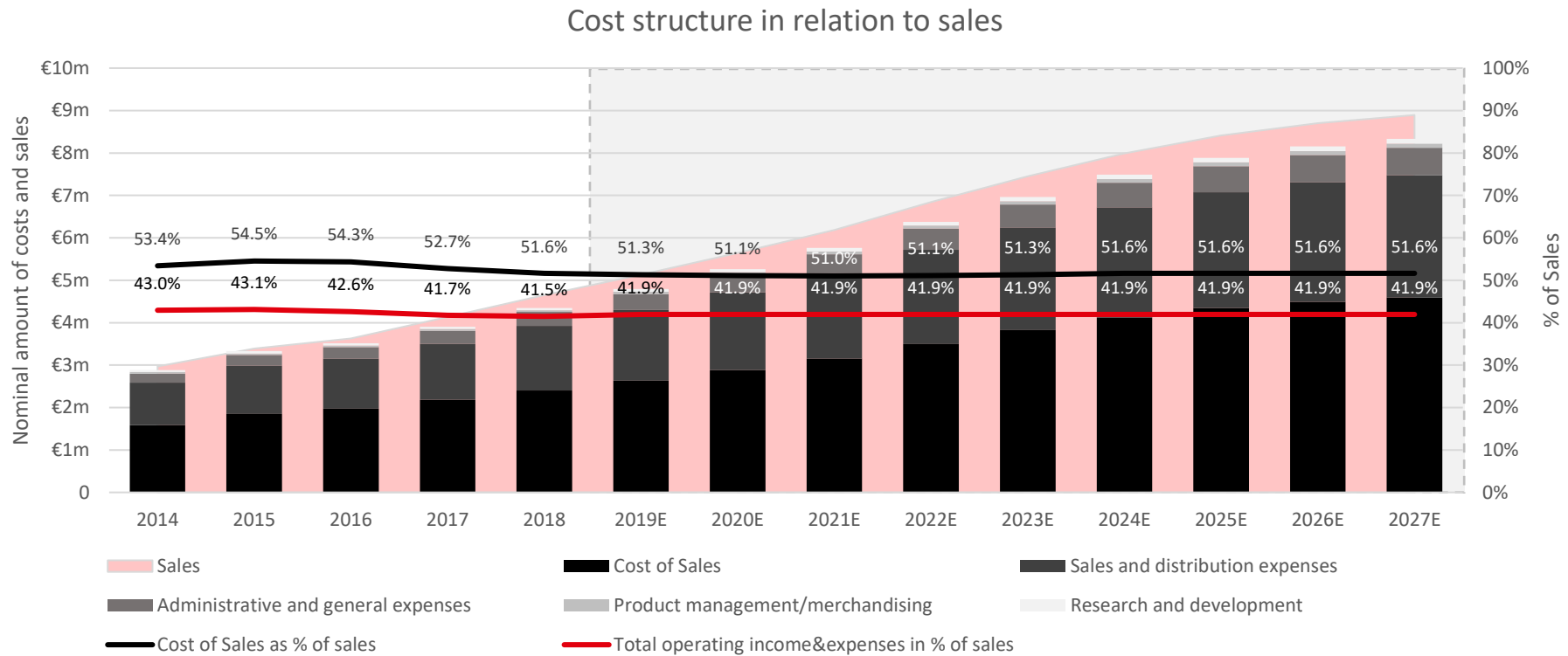
Figure 31: Cost structure in relation to sales

Remark: Longtime historical financial information may provide useful information. However, it often does no longer represent the current state of the company. According to (Rosenbaum and Pearl 2009), the three year historical average or ratios are good indicators for a company's' future financial performance. In the case of PUMA, a significant turnaround was achieved in recent years. For this reason, the metrics from the last three years are basis for several forecasts in this valuation.

EBIT and EBIT Margin

EBIT is calculated by subtracting operating costs from sales and reflects the operating result of PUMA. From a historical perspective, strong EBIT results from FY14 to FY18 were accomplished. From FY19, EBIT is estimated to grow with a CAGR of 9.03% until FY23 and normalizing as the company reaches a critical size within its market. The EBIT margin also evolved positively from FY14 to FY18 and a constant level is expected until FY23 when reaching a constant margin of 6.6%. Even though the management expects a higher EBIT margin, this level is assumed for the reason of increasing labor costs in the sourcing countries, higher marketing expenses for sport sponsorships and the costly re-entry to the basketball market in the US. PUMA's biggest competitors have advantages in scale, reflecting a lower marketing-expense ratio compared to PUMA. Adidas shows an EBIT margin of 10.8% and Nike of 12.2%. A summary of PUMA's operating result is illustrated below.
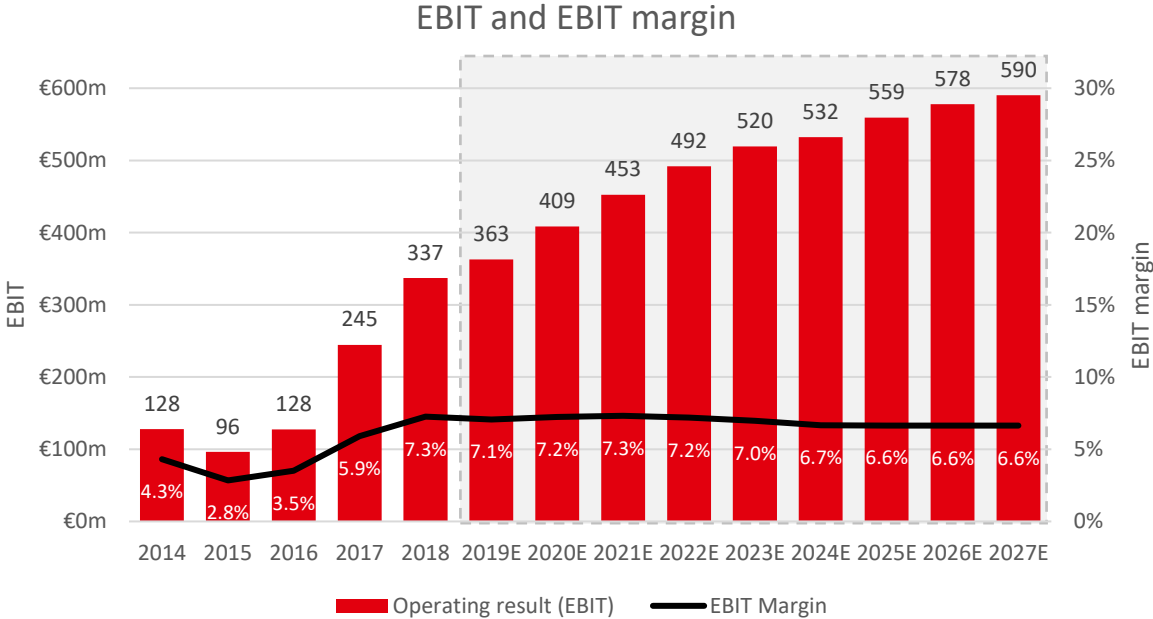
Figure 32: EBIT and EBIT margin

Financial Expenses

The EBT is computed by deducting financial expenses from the EBIT. Financial expenses are subdivided between interest expenses, interest accrued on liabilities from acquisitions, valuation of pension plans, currency-conversion expenses, and others. Puma has a conservative financing approach and thus, interest expenses remain low. However, the company issued a promissory note loan, totaling €160m in account of the special dividend from FY17 amounting to €186.8m and paid in FY18. Therefore, interest expenses are expected to increase and forecasted as a 3years-average of financial liabilities. Fees are paid for syndicated credit lines of 350m, which are not utilized. An overview of the structure and development of financial expenses is illustrated below.
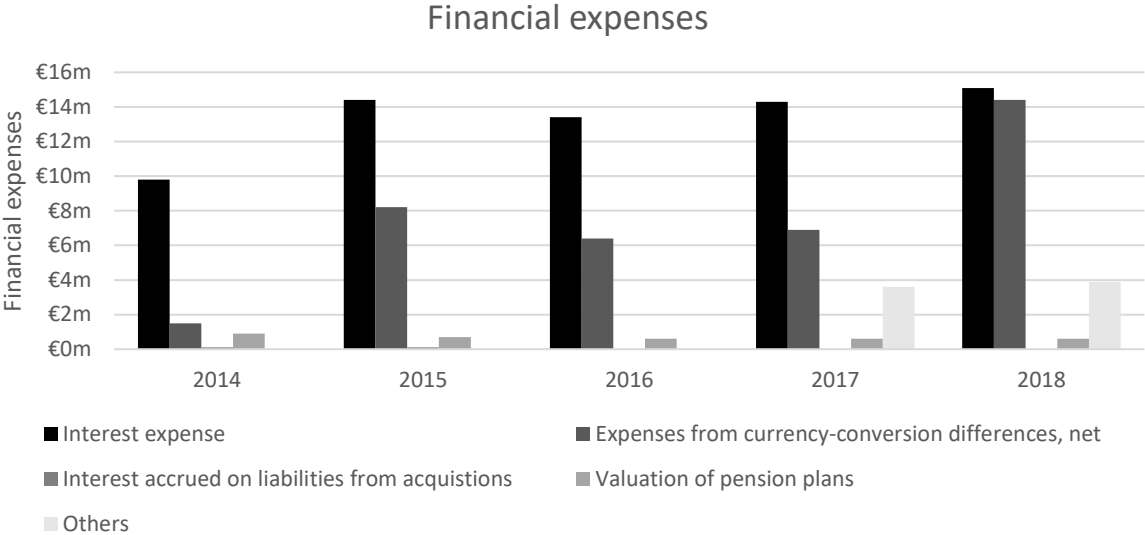
Figure 33: Financial expenses

Tax rate

There is no consensus among academics and practitioners about an appropriate tax rate, as discussed in the literature review chapter 2.1.4. International exposure let several subsidiaries distorting the marginal tax rate of Germany or more precisely the tax rate of the state Bavaria. PUMA splits its income taxes between Germany and "other", where the larger proportion belongs to "other". For the vague disclosure of information, the best proxy is an average of the past 3 years of the effective tax rate, taking the changes of new tax laws in the US and other countries into account. This results in an expected constant tax rate of 26.57%.

Consolidated net earnings

EBT is the basis for taxation. By subtracting taxes from EBT, the consolidated net earnings are calculated. PUMA holds majority stake in companies in the North American market, namely Janed, PUMA Kids Apparel and PUMA Accessories North America. In these companies, PUMA is the economic owner, and thus, fully included in its consolidated financial statements. Therefore, non-controlling interests are deducted from the consolidated net earnings to obtain the net income. For the forecast, a ratio of minority interest to consolidated net earnings is kept constant on basis of FY18 because no further information about majority stakes are provided by the management. An overview of the net income and net income margin as well as the income margin bridge for FY18 is presented below. The income statement is attached in Appendix 2.
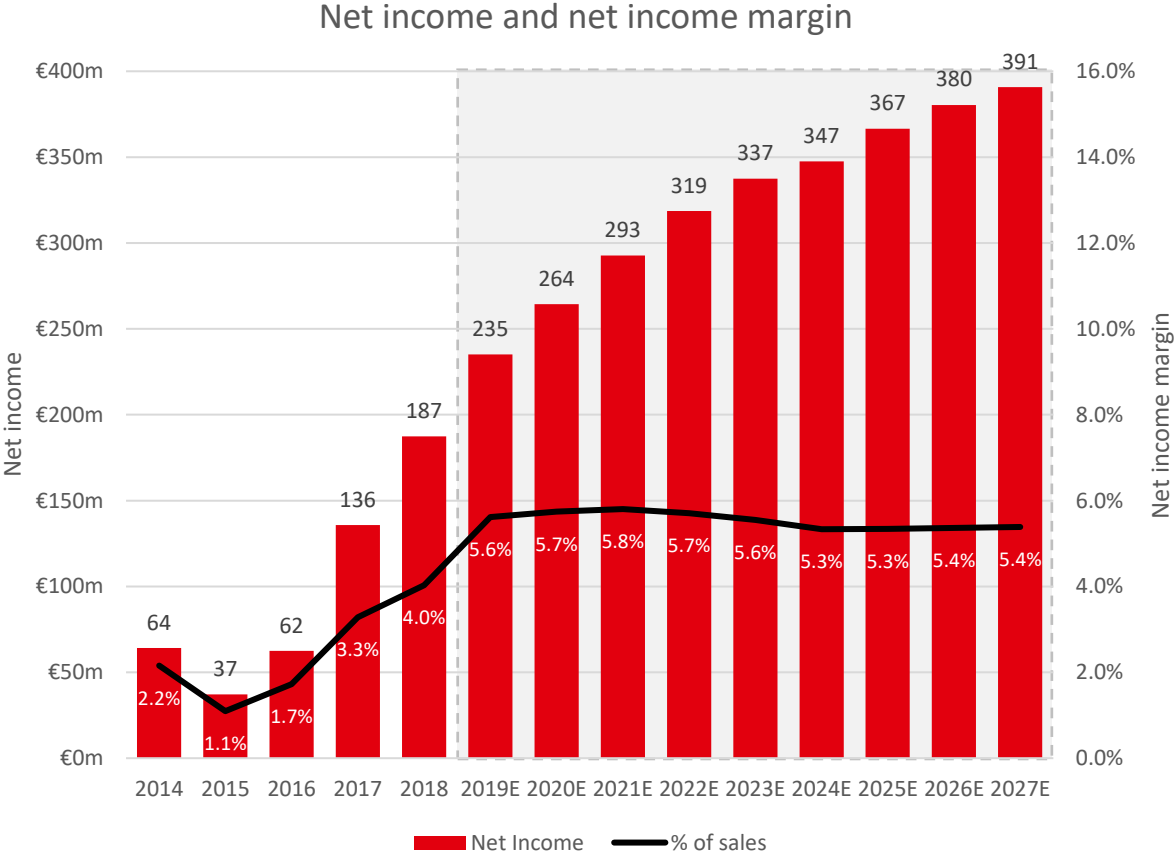
Figure 34: Net income and net income margin
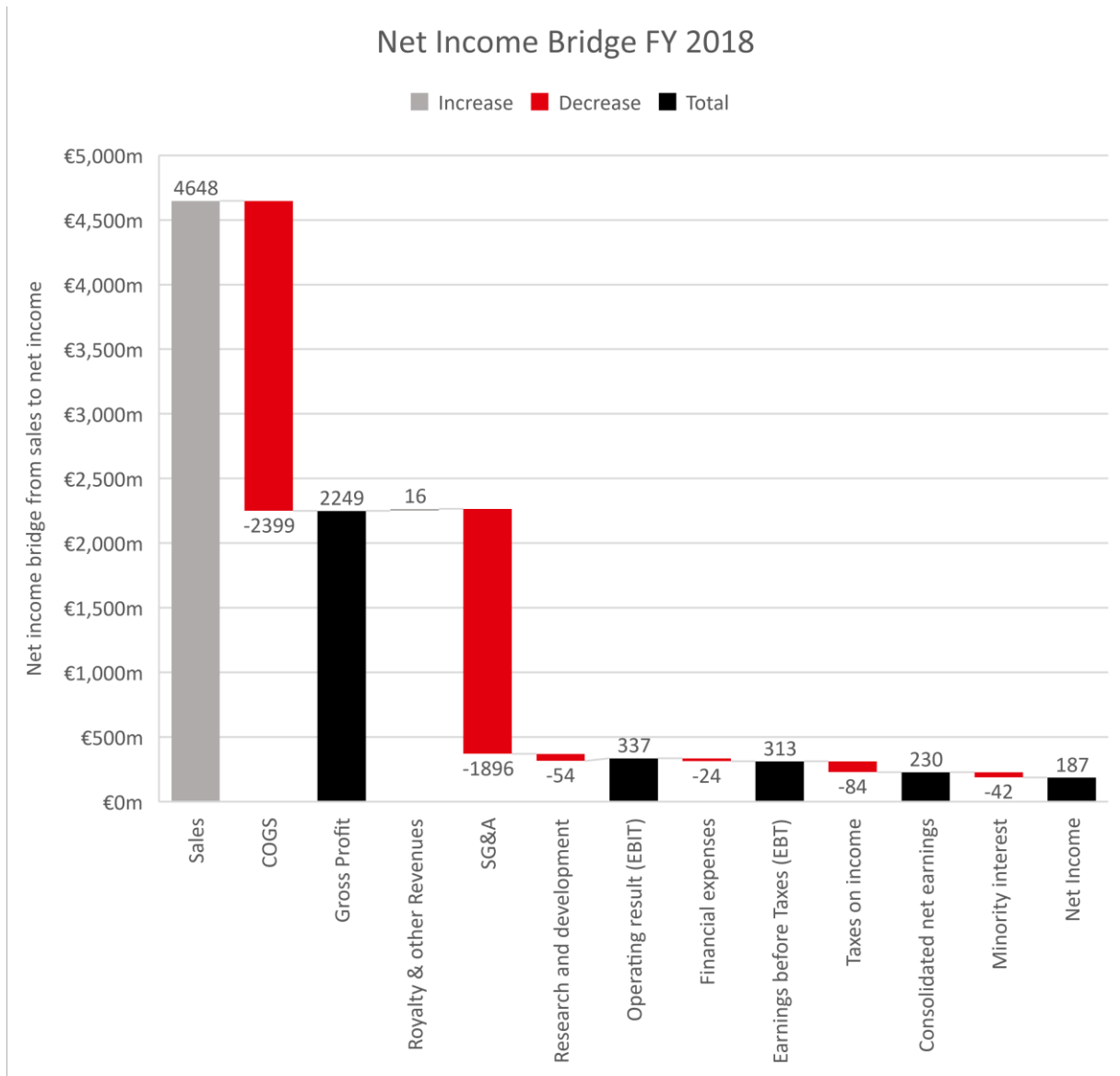
Figure 35: Net income bridge FY18

From PP&E and Intangibles to D&A to CAPEX

A skip-over to the balance sheet positions PP&E and intangibles is necessary to analyze and forecast the positions of CAPEX and D&A. As a best practice approach and in line with the literature of (Rosenbaum and Pearl 2009), PP&E and intangibles are forecasted as a function of sales, using the last 3-years average ratio for each item to be consistent. Hence, D&A is forecasted with the end-of-year ratio of PP&E and intangibles from FY16-FY18, as illustrated below:

PP&E + Intangibles and D&A ratio
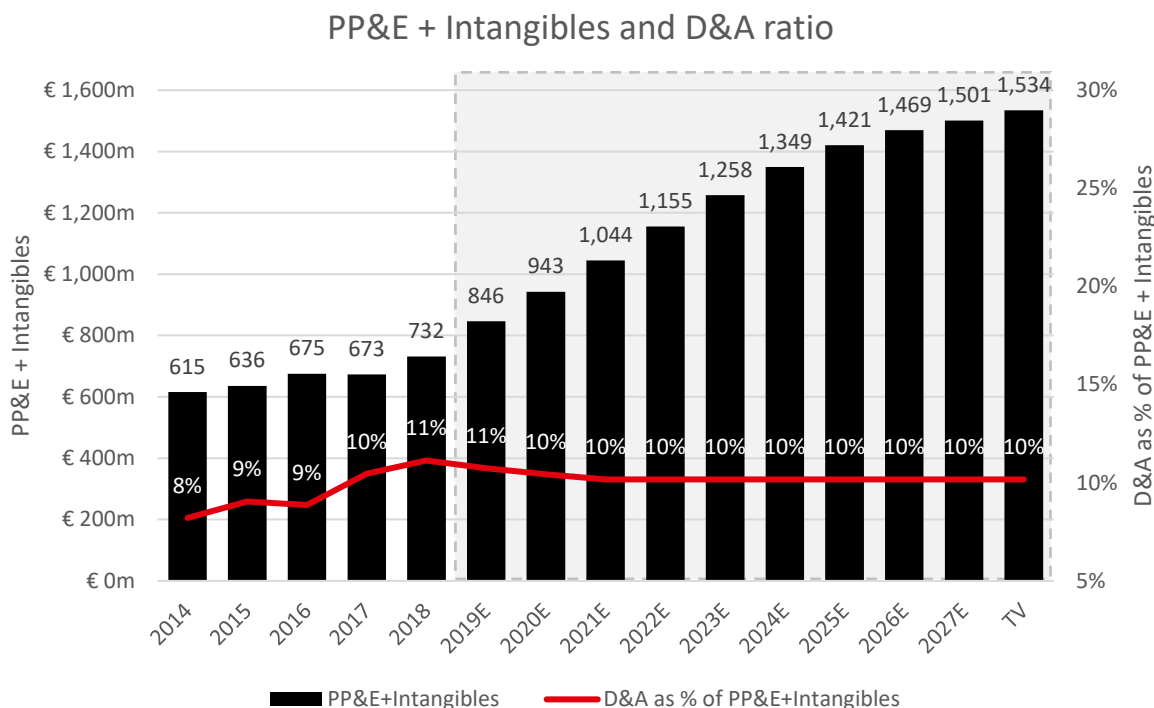
Figure 36: PP&E + Intangibles and D&A ratio

The CAPEX is forecasted as the difference between PP&E FY1 an d PP&E FY0 plus depreciation FY1. The same procedure follows with intangibles and amortization. The CAPEX is the sum of acquisition PP&E and acquisition of intangibles. A summary is presented below.

CAPEX development and forecast
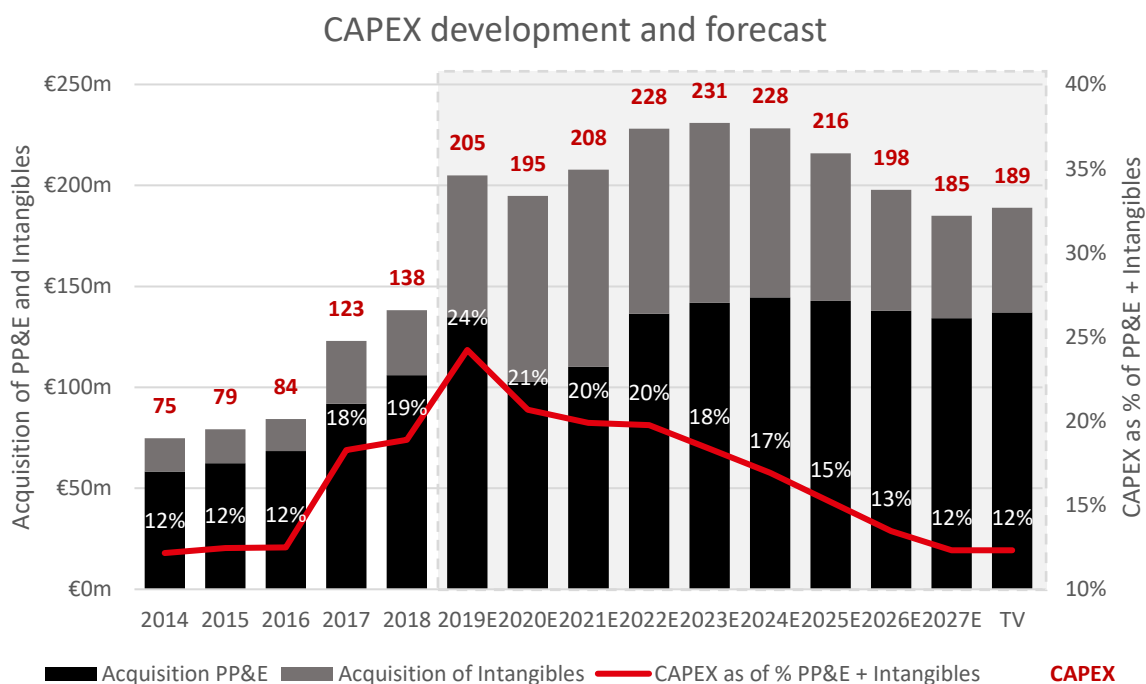
Figure 37: CAPEX development and forecast

The CAPEX-to-PP&E and intangibles ratio is decreasing. This is explained by slower growth rates of net sales over time and a consequential decrease of change in PP&E, which is a function of sales. At the same time, the D&A-to-PP&E ratio remains constant. Strong investments to implement parts of PUMA's strategical turnaround and to achieve its growth plans explain the increasing CAPEX ratio historically. The "jump" of CAPEX from FY18 to FY19 is a result of PUMA`s plans for new investments in FY19 for around €200m. Projects include IT infrastructure improvements and store openings to provide the operating requirements that are necessary to maintain growth. For this reason, an adjustment factor of PP&E and intangible growth was implicated, ending up in a CAPEX of €205m for FY19. This explains a strong rise in FY19 from 19% to 24% CAPEX-to-PP&E and intangibles ratio in Figure 37. From FY20-FY27, the ratio decreases as result of extraordinary investments of the past that led to higher productivity through improved infrastructure and economics of scale. Respectively, the ratio of CAPEX and D&A increases in FY19 and decreases to a constant ratio of 1.2x in FY27 and terminal value (TV), indicating a reasonable long-term growth, as seen in chapter 6.4. The valuation practice, that CAPEX equals D&A in perpetuity is not applied in accordance with (Matthews 2014). An overview of the D&A and CAPEX development is presented below.
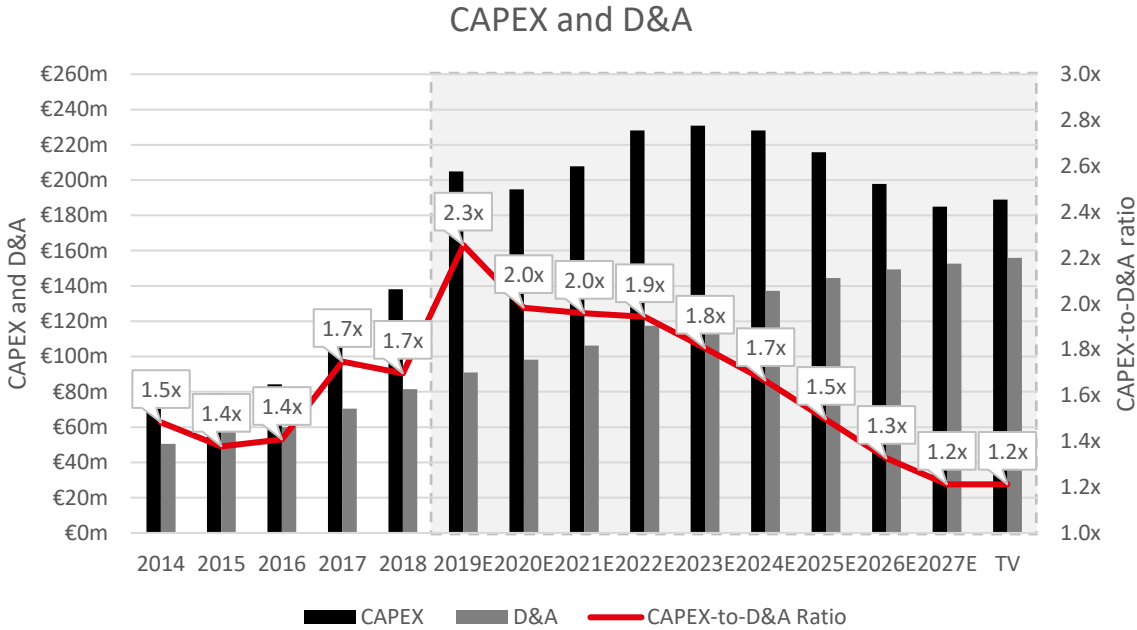
Figure 38: CAPEX and D&A

All tables regarding PP&E, Intangibles, D&A and CAPEX are stated in Appendix 3, Appendix 13, Appendix 14, respectively.

6.2   Financial Forecast – Balance Sheet

Financing Structure

In FY18, a new loan was issued that increased the long-term debt to equity ratio to 11%. This ratio is expected to remain constant until the company reaches steady state. Nevertheless, PUMA maintains its conservative capital structure with low debt levels. €170m of €180m long-term debt was issued in 2018. For that reason, it is assumed that the book value of debt is the best proxy for the market value of debt. PUMA confirmed that fair values of other financial liabilities are determined based on the present values considering prevailing interest rate parameters. By adding up financial liabilities with cash and cash equivalents, the net-debt can be derived, resulting in a negative net debt of -€263m in FY 18. *Figure* 39 illustrates the development of net debt and *Table 5* presents an overview of the capital structure.
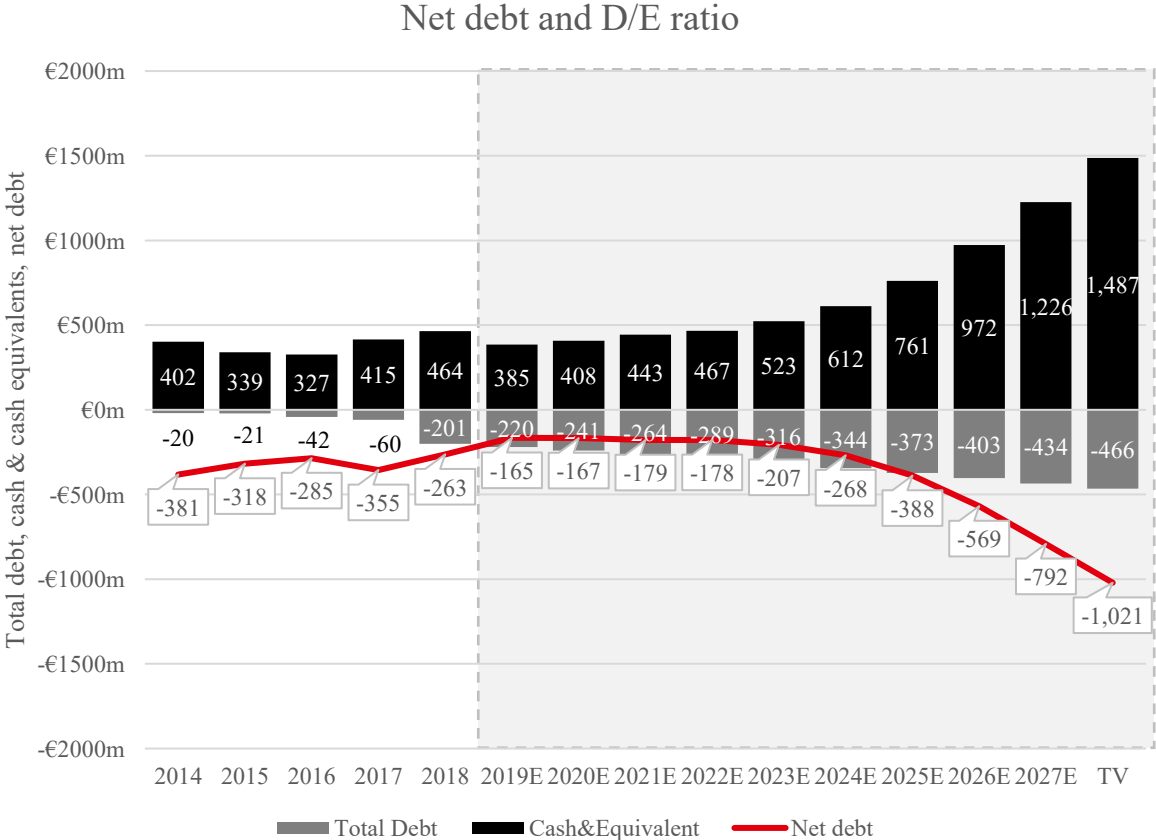
Figure 39: Net debt

€m	Capital Structure Historical					Capital Structure Forecast									
	2014	2015	2016	2017	2018	2019E	2020E	2021E	2022E	2023E	2024E	2025E	2026E	2027E	TV
Current financial liabilities	20	14	25	29	21	21	21	21	21	21	21	21	21	21	21
Liabilities from finance lease ST (up	0	1	0	0	1	1	1	1	1	1	1	1	1	1	1
OTHER non current FL	0	7	16	31	181	199	220	244	269	296	323	353	383	414	446
Total Debt	-20	-21	-42	-60	-201	-220	-241	-264	-289	-316	-344	-373	-403	-434	-466
Cash&Equivalent	402	339	327	415	464	385	408	443	467	523	612	761	972	1226	1487
Net debt	-381	-318	-285	-355	-263	-165	-167	-179	-178	-207	-268	-388	-569	-792	-1021
Total Equity	1595	1611	1707	1626	1703	1880	2078	2297	2536	2789	3050	3325	3610	3903	4204
D/E ratio	1.3%	1.3%	2.4%	3.7%	11.8%	11.7%	11.6%	11.5%	11.4%	11.3%	11.3%	11.2%	11.2%	11.1%	11.1%
Net debt/Equity	-23.6%	-19.7%	-16.7%	-21.8%	-15.4%	-8.8%	-8.0%	-7.8%	-7.0%	-7.4%	-8.8%	-11.7%	-15.8%	-20.3%	-24.3%
Only interest	-10	-14	-13	-14	-15	-23	-25	-27	-29	-31	-34	-36	-39	-42	-44
%only interest payments debt	48.8%	67.9%	32.3%	23.8%	7.5%	10.6%	10.4%	10.2%	10.0%	9.9%	9.8%	9.7%	9.6%	9.6%	9.5%

Table 5: Capital structure

At this stage, it is necessary to discuss the dividend payout ratio. PUMA´s payout policy indicates a range between 25% and 35%. Due to lower payouts in the past years, this ratio is expected to be stable at 25%. With higher expected earnings, the cash pile is consequently increasing in the following years and thus, net debt remains negative.

Net Working Capital

As a producer and distributer of sporting goods, working capital management is an essential mechanism to increase free cash positions for PUMA. To analyze its efficiency, the cash conversion cycle (CCC), a measure of the days it takes a company to transform its investments from inventory into cash flows from revenues is calculated. The CCC is calculated as follows:

$$CCC = DIO + DSO - DPO \qquad (18)$$

Where:
$CCC = Cash\ conversion\ cycle$
$DIO = Days\ of\ inventory\ outstanding$
$DSO = Days\ sales\ outstanding$
$DPO = Days\ payables\ outstanding$

Formula 18: Cash conversion cycle

DIO is a function of time on average for making revenues from inventory and is linked with COGS. DSO measures the days to generate cash from receivables after a sale and relates to revenue. DPO represents the days that are necessary to pay the bills for suppliers. A lower CCC metric is positive for the company as it represents the time capital is tied-up. The 3-years average of the key metrics DSO, DIO and DPO, are used to forecast the accounts receivables, inventory and accounts payables, respectively.
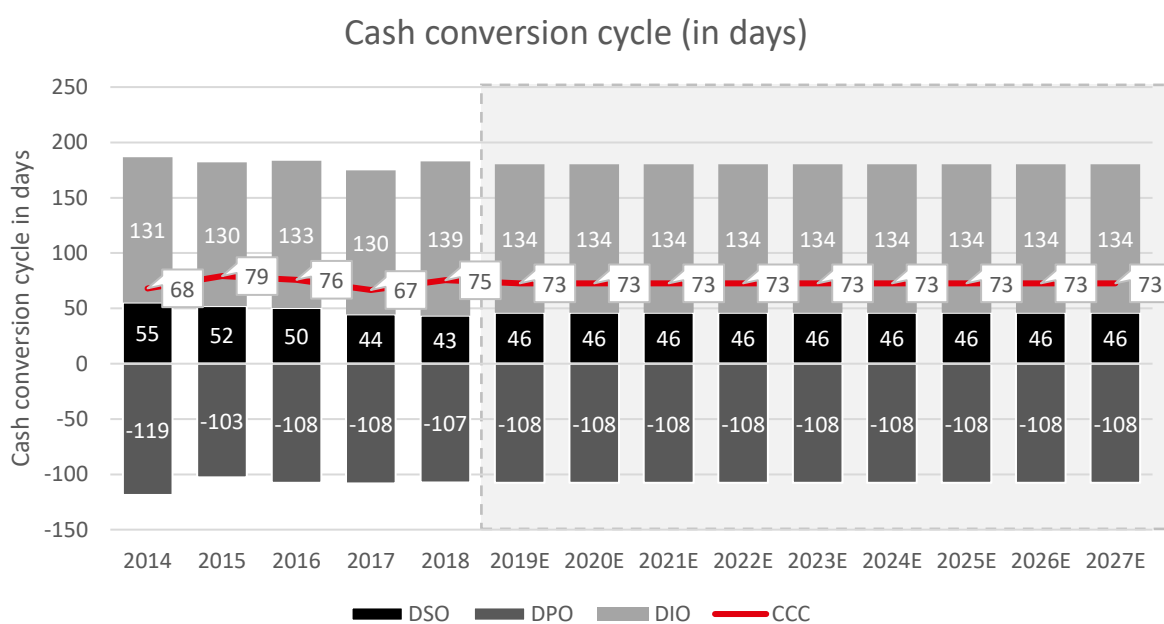
Figure 40: Cash conversion cycle

The cash conversion cycle from Adidas of 92.4 days and from Nike of 92.4 days proves strong cash management achievements in comparison to its main competitors.

DSO, DPO and DIO are metrics to forecast trade receivables, trade payables and inventories, respectively. To complete working capital calculations, income tax receivables and deferred income taxes are added whereas income taxes (payables) and deferred taxes are subtracted. For the determination of the FCFF, the year-to-tear change is relevant. An overview of the (change) net working capital is presented in the following table.

Change Net Working Capital Historical						Change Net Working Capital Forecast									
€ m	2014	2015	2016	2017	2018	2019E	2020E	2021E	2022E	2023E	2024E	2025E	2026E	2027E	TV
Inventories	571,5	657,0	718,9	778,5	915,1	968,2	1060,8	1160,5	1286,0	1406,2	1516,8	1597,1	1651,7	1688,0	1725,2
Trade Receivables	449,2	483,1	499,2	503,7	553,7	647,5	712,2	780,7	863,4	940,4	1008,5	1061,9	1098,2	1122,3	1147,0
Income tax receivables	75,0	50,5	37,4	26,8	33,9	37,4	41,2	45,1	49,9	54,4	58,3	61,4	63,5	64,9	66,3
Deferred income taxes	178,8	219,8	229,5	207,9	207,6	270,6	297,6	326,3	360,8	393,0	421,5	443,8	459,0	469,1	479,4
Trade Payables	-515,2	-519,7	-580,6	-646,1	-705,3	-776,6	-850,8	-930,8	-1031,5	-1127,9	-1216,6	-1281,0	-1324,8	-1353,9	-1383,7
Income taxes (payables)	-58,8	-49,7	-41,4	-54,7	-68,0	-75,1	-82,6	-90,5	-100,1	-109,0	-116,9	-123,1	-127,3	-130,1	-133,0
Deferred taxes	-54,6	-64,2	-63,1	-37,6	-47,7	-62,9	-69,1	-75,8	-83,8	-91,3	-97,9	-103,1	-106,6	-109,0	-111,4
Net Working Capital	645,9	776,8	799,9	778,5	889,3	1009,2	1109,2	1215,4	1344,7	1465,8	1573,6	1657,0	1713,6	1751,3	1789,8
Change in Net Working Capital	-65,0	130,9	23,1	-21,4	110,8	119,9	100,0	106,2	129,3	121,0	107,8	83,4	56,6	37,7	2,8

Table 6: Change Net Working Capital

6.3 Discount Rate

Free cash flows need an adjustment for the time value of money. Basis for this adjustment is the discount factor, the WACC. Its components are described in the following chapters.

6.3.1 Cost of Debt

Issued bonds normally serve as a proxy to determine the cost of debt. Since PUMA does not issue bonds, a debt rating of independent rating agencies can be used as a proxy for issued bonds by other companies with the same risk characteristics to estimate the cost of debt. The investment grade A+ rating (provided by Egan-Jones on 19 June 2018) is used to derive to the cost of capital. The outstanding debt of PUMA is split in two €20m short-term liabilities and €160m long-term liabilities.

German corporate bonds with the same rating and yields of the average maturity of PUMA´s debt (3.2 years on current average loans) gives a cost of debt of 0.199% (Thomson Reuters Eikon 2019). This gives an after-tax cost of debt 0.15% as illustrated below.

After-tax cost of debt			
Other non-current liabilities		Current financial liabilities	
Maturity (Y)	Debt (€m)	Maturity (Y)	Debt (€m)
1	20	1	20
3	100		
5	60		
	Average Maturity	3,2	
	A-rated corporate bond yield	0,199%	
	Tax rate	26,57%	
	After tax cost of debt	0,15%	

Figure 41:After-tax cost of debt

However, this rate does not represent the actual interest expenses. One reason are fees for an unutilized syndicated credit line of €350m that adds up in the interest expenses. More information is not provided in the financial statements or other resources. PUMA states an effective interest rate between 0.1% and 8.4%.

However, since PUMA has negative net debt, the cost of debt has no relevance for the discount factor of the DCF. Thus, the WACC equals the cost of equity, which applied to discount the FCFF.

6.3.2 Cost of Equity

The cost of equity is estimated based on the CAPM. The input factors are evaluated in the following chapters.

6.3.2.1 Risk Free Rate

For the risk-free rate, the average yield for a 10-year German Government Bond is chosen as of 31 December 2018 with a rate of 0.29%. The bonds are assumed to be riskless, trade in the same currency as PUMA and demonstrate high liquidity (Federal Reserve Bank of St. Louis 2019).
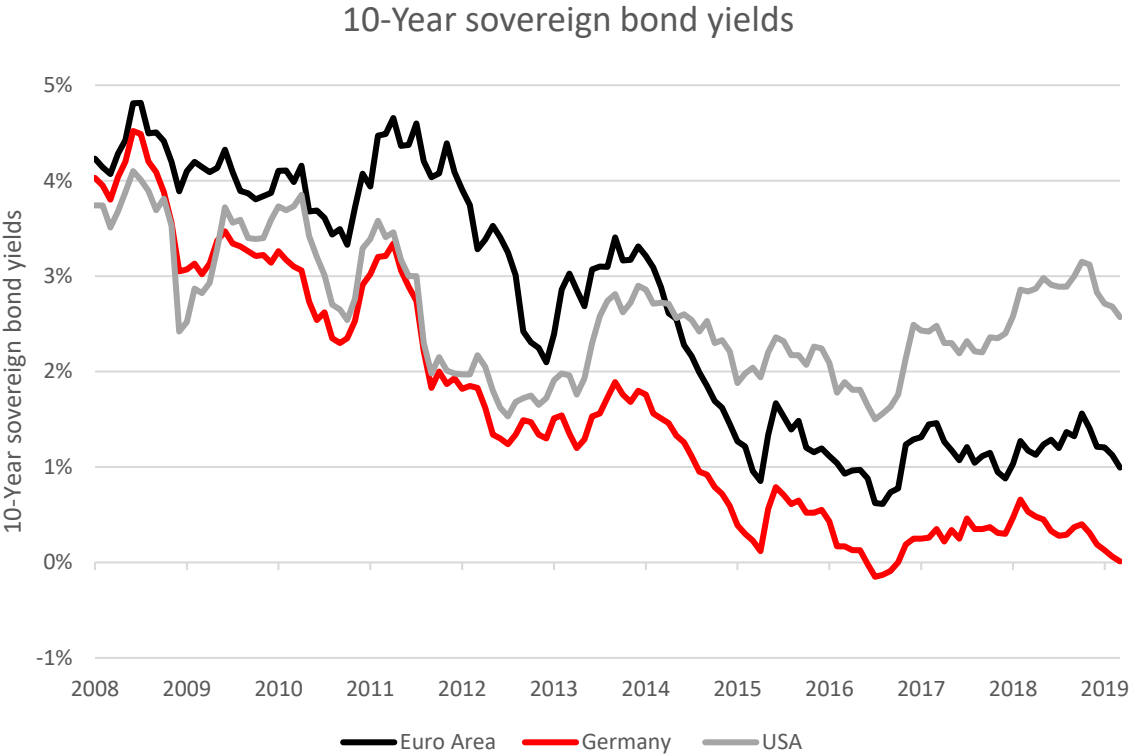
Figure 42: 10-Year sovereign bond yields

6.3.2.2 Beta

The beta was derived by linear regression of PUMA´s share price volatility against the market price volatility. PUMA`s historical weekly returns from the last 5 years (28 December 13 until 29 December 18) were regressed against the market with the proxies MSCI World and MDAX. As a result, PUMA`s beta estimation against the MDAX is 0.677 and against the MSCI World 0.751 that indicates a lower riskiness compared to the market (Figure 43 and Figure 44).
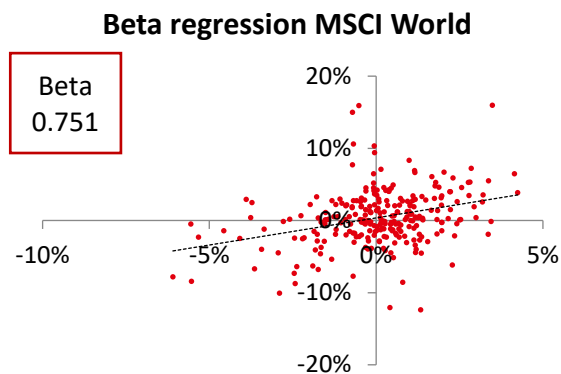
Figure 43: Beta regression MSCI World
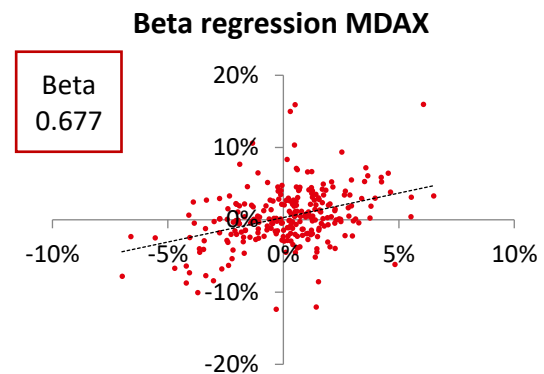
Figure 44: Beta regression MDAX

The summary statistics of the beta calculation are attached in Appendix 8. To test the robustness of the regressed beta, a bottom-up approach was applied. The 5-year levered betas of all selected peers were obtained from Thomson Reuters Eikon (15/04/2019). In the next step, these betas were unlevered with the respective marginal tax rates (KPMG 2019) and debt-to-equity ratio. Lastly, the unlevered beta was re-levered with the expected leverage ratio and respective tax rate. The obtained beta has a value of 0.670 and is in line with the MDAX regression. Evidence showed that forecasted betas are closer to one than the determined values calculated from historical data. Thus, Blume`s adjustment is applied (Blume 1979). This adjustment results in a beta of 0.795, used as basis for the calculation of the cost of equity.

6.3.2.3 Market Risk Premium

The Institute of Public Auditors in Germany (IDW) recommends a range between 5.5% - 7% for the market risk premium (MRP) for German companies. (KPMG 2018b) regularly estimates the current MRP and suggests 7% for German companies in their latest update (May 2018). With the current level of risk-free rates, the assumption of 7% is used for assessing the CAPM for PUMA. Because 7% is the upper range of the IDW suggestion and higher than the average of used MRPs in 2017 for German companies, this value will be stressed in the sensitivity analysis represented in the WACC derivation.

6.3.3 WACC Calculation

Since PUMA's net debt is negative, the WACC equals the cost of equity. The cost of equity, which represents the discount rate for the FCFF is calculated with the CAPM model. The input factors are presented as follows.
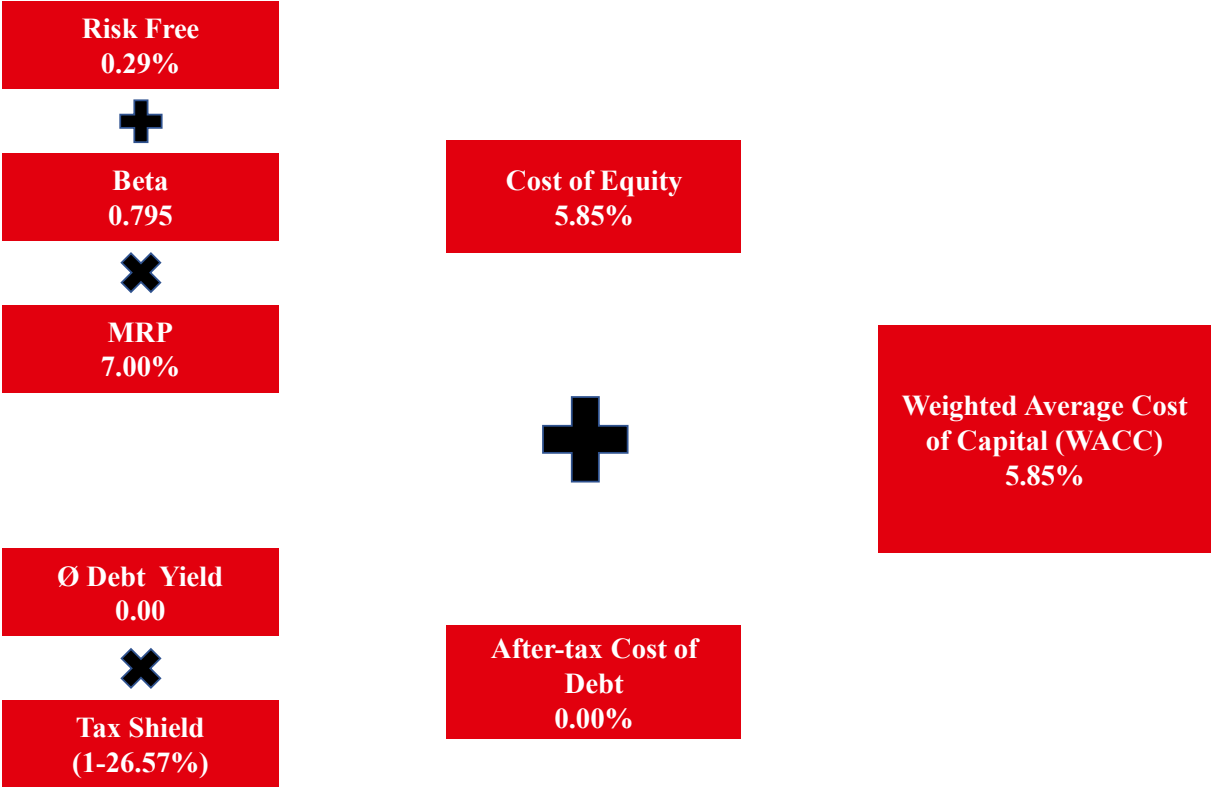
Figure 45: Summary WACC Calculation

6.4 Long-term Growth Rate

For the terminal growth rate, various potential approaches are examined. Most importantly, the long-term growth rate should not be higher than the nominal GDP growth, weighted by the countries where the company is operating. This is explained by the fact that no firm can sustain a growth higher than the economy in perpetuity (Damodaran 2012). The upper boundary is the nominal GDP, weighted for PUMA´s worldwide revenues. Using the longest possible forecast period until year 2023 provided by (IMF 2019), a weighted nominal GDP of 5.01% is calculated. However, under the assumption that only stable and high growth firms are basis of this assumption, the long-term growth rate must be lower. The lower bound is the long-term inflation rate for the country where the company has its main assets. Here, estimations by IMF provide a rate of 2.2% for year 2023 which is used as a proxy for long-term inflation. Plausibility is checked with consensus estimates for the growth rate used for PUMA´s equity valuation.

Four investment banks estimate the long-term growth rate between 1% and 2.5%, giving an average of 1.86%. Due to the fact, that these estimates range below the assumption of the lower bound of 2,2%, the long-term inflation rate of 2.2% is the proxy for PUMA's long-term growth rate.

Terminal Value Estimation	
Consensus	
Credit Suisse	2.00%
RBC	2.50%
Macquiarie	1.85%
Warburg	1.00%
Average	**1.84%**
LT Inflation Germany (Lower Bound)	2.20%
Real GDP (Upper Bound)	5.01%
Consensus	1.84%
TV re-investment rate and ROIC	2.44%
TV	**2.20%**

Table 7: Terminal growth rate

Since this input factor heavily influences the calculation of PUMA`s value, growth rate deviations are tested within the sensitivity analysis.

6.5 Discounted Cash Flow

To calculate the implied enterprise value of the company, the first step is to discount the FCFF with the cost of equity of 5.85% to 1 January 2019 for the explicit period of FY19 until FY27. The next step is to calculate the terminal value, discounted to the same date. The last stage is to sum up the discounted FCFF with the terminal value. The enterprise value represents all core business operations of PUMA. However, the goal is to find the value that is available to its shareholders. This value is represented by the equity value, which is the amount that remains for the shareholders after all debts are paid. The equity bridge shows all items of the balance sheet that are adjusted for transforming the enterprise value to the equity value. Cash and cash equivalents, unfunded pension obligations and long-term investments are added, whereas debt, non-controlling interest are subtracted. The non-controlling interest is a function of the book value and the FY0 P/E multiple. By dividing the average number of shares outstanding with the equity value, the share price based on the FCFF is presented below in the DCF model.

DCF - Free Cash Flow to the Firm (FCFF)

Currency: €m	2018A	2019E	2020E	2021E	2022E	2023E	2024E	2025E	2026E	2027E	TV
Revenues	4648.3	5131.3	5644.0	6186.8	6842.4	7452.6	7992.1	8415.5	8702.9	8894.4	9090.1
Growth YoY in %	*12.4%*	*10.4%*	*10.0%*	*9.6%*	*10.6%*	*8.9%*	*7.2%*	*5.3%*	*3.4%*	*2.2%*	*2.2%*
EBITDA	**419.3**	**453.6**	**506.9**	**558.7**	**609.4**	**647.5**	**669.2**	**703.8**	**727.3**	**742.9**	**759.3**
EBITDA Margin	*9.0%*	*8.8%*	*9.0%*	*9.0%*	*8.9%*	*8.7%*	*8.4%*	*8.4%*	*8.4%*	*8.4%*	*8.35%*
(+) Depreciation & Amortisation	-82.1	-90.9	-98.3	-106.2	-117.4	-127.9	-137.1	-144.4	-149.3	-152.6	-156.33
EBIT	**337.2**	**362.7**	**408.6**	**452.6**	**492.0**	**519.6**	**532.1**	**559.4**	**578.0**	**590.3**	**603.0**
EBIT Margin	*7.3%*	*7.1%*	*7.2%*	*7.3%*	*7.2%*	*7.0%*	*6.7%*	*6.6%*	*6.6%*	*6.6%*	*6.6%*
(-) Taxes *(tax rate: 26,57%)*	83.6	96.4	108.6	120.3	130.7	138.1	141.4	148.6	153.6	156.9	160.22
NOPAT	**253.6**	**266.3**	**300.1**	**332.3**	**361.3**	**381.5**	**390.7**	**410.8**	**424.4**	**433.5**	**442.74**
(+) Depreciation & Amortisation	82.1	90.9	98.3	106.2	117.4	127.9	137.1	144.4	149.3	152.6	156.33
(-) Capital Expenditures	-138.2	-205.0	-194.8	-207.8	-228.1	-230.9	-228.2	-215.9	-197.8	-184.9	-189.0
(-) Change in Net Working Capital	-110.8	-119.9	-100.0	-106.2	-129.3	-121.0	-107.8	-83.4	-56.6	-37.7	-2.8
FCFF	**86.7**	**32.4**	**103.5**	**124.5**	**121.3**	**157.5**	**191.8**	**255.9**	**319.3**	**363.4**	**407.2**

Discounted Cash Flow

Currency: €m	2018A	2019E	2020E	2021E	2022E	2023E	2024E	2025E	2026E	2027E	TV
Free Cash Flow	**86.7**	**32.4**	**103.5**	**124.5**	**121.3**	**157.5**	**191.8**	**255.9**	**319.3**	**363.4**	**407.2**
WACC	**5.85%**										
Present Value of FCFF		**30.6**	**92.4**	**104.9**	**96.6**	**118.5**	**136.3**	**171.8**	**202.5**	**217.8**	**6676.8**
Sum of Present Value FCFF FY19-FY27		**1171.48**									
Present Value of Terminal Value		**6676.76**									
Implied Enterprise Value		**7848.24**									
(+) Cash & Cash Equivalents		463.70									
(+) LT and Equity Investments		0.00									
(-) Unfunded Pension Obligations		-29.70									
(-) Debt		-262.60									
(-) Non-Controlling Interest		-366.96									
Total Adjustments to EV		**-195.56**									
Equity Value as of 31.12.2018		**7652.68**									
./. Shares Outstanding		14.95									
Value Per Share		**511.99**									

Key Assumptions

Valuation Date	12/31/2018
Tax Rate	26.57%
Perpetuity growth	2.20%
Beta	0.795
MRP	7.00%
Risk free rate	0.29%
D/E ratio	0
WACC	5.85%

Table 8: DCF - Free Cash Flow to the Firm

6.6 Sensitivity Analysis

Some variables of an equity valuation are underlying assumptions and future expectations. A change in one of these variables can have a significant impact on valuation outcomes. The variables are isolated and taken as an input for a "what-if" analysis. Then, a range of outputs for each possible combination of variables is computed. The stressed variables are cost of capital and long-term growth rate with variations of ± 0.75 and ± 0.2 percentage points. The two tables below present the outcomes of the sensitivity analyses.

Equity Value							
	Growth Rate						
	1.6%	1.8%	2.0%	2.2%	2.4%	2.6%	2.8%
3.60%	15744	17380	19425	22051	25549	30440	37761
4.35%	11048	11836	12759	13852	15170	16787	18821
5.10%	8399	8848	9355	9932	10594	11362	12263
5.85%	6711	6994	7306	**7653**	8039	8473	8964
6.60%	5552	5742	5949	6175	6422	6694	6995
7.35%	4712	4846	4991	5147	5315	5498	5696
8.10%	4080	4179	4284	4396	4516	4644	4783

Table 9: Sensitivity analysis - Equity Value

Share price							
	Growth Rate						
	1.6%	1.8%	2.0%	2.2%	2.4%	2.6%	2.8%
3.60%	1053	1163	1300	1475	1709	2037	2526
4.35%	739	792	854	927	1015	1123	1259
5.10%	562	592	626	664	709	760	820
5.85%	449	468	489	**512**	538	567	600
6.60%	371	384	398	413	430	448	468
7.35%	315	324	334	344	356	368	381
8.10%	273	280	287	294	302	311	320

Table 10: Sensitivity analysis - Share Price

7 Multiples / Relative Valuation

The value derived from a relative valuation by using multiples represents the market value of a company based on key statistics. This gives another perspective from the calculated intrinsic value from the DCF.

7.1 Peer Group Selection

The selection of peers is obtained with utmost caution to receive a valid comparable price from the market. Spectra of multiples diverge for companies in different industries. Hence, a list of 39 public companies within the same industry from Thomson Reuters Eikon is analyzed (Apendix 9). Companies with different business models or products for other target customers are eliminated due to different product margins and risk exposure (e.g., luxury fashion, outdoor). After this rough selection, a narrower choice of 17 companies is left (Appendix 10). Next, a ranking is applied with ranges that are in line with PUMA´s financial metrics. Rankings are calibrated for size, operating profits, operating margins earnings, ROIC, EPS and historical and expected growth as well as capital structure:

Peer company selection criteria	
Business Profile	**Financial Profile**
- Sector	- Size
- Products and Services	- Profitability
- Customers and End Markets	- Growth Profile
- Distribution Channels	- Return on Investment
- Geography	- Credit Profile

Table 11: Peer company selection criteria

By eliminating the companies with low rankings, seven companies are left that are basis for the valuation.

Company Name	Market Cap (€bn)	Revenue (€bn)	EBITDA (€m)	EBITDA Margin	ROIC	EPS	LT-Growth	Net Debt (€m)
Under Armour Inc	8.23	4.53	296.37	6.8%	7.5%	-0.09	38.0%	149.47
Skechers USA Inc	4.13	4.05	477.33	12.0%	31.0%	1.69		-763.16
Columbia Sportswear Co	5.86	2.44	356.80	14.8%	36.6%	3.36	7.9%	-610.89
Li Ning Co Ltd	3.54	1.33	145.16	11.1%		0.04	35.6%	-465.61
Adidas AG	50.50	21.92	2,948.00	13.8%		8.42	15.2%	-1,192.00
Lululemon Athletica Inc	20.14	2.87	721.88	24.0%	89.5%	3.21	18.9%	-769.45
Nike Inc	117.46	31.14	4,464.49	14.3%	24.5%	1.01	14.0%	-1,227.54
Asics Corp	2.05	3.08	173.05	4.1%	2.1%	-0.86		-86.75
Puma SE	8.34	4, 65	420.00	9.0%	16.7%	12.54	26.0%	-262.60

Table 12: Peer companies

Some companies need to be further discussed. Adidas and Nike are companies with a different financial profile in terms of company size, but both companies are PUMA's main competitors and thus, need to be included in the peer group. Asics and Under Armour disclosed negative net earnings in FY18 which consequently gives a negative multiple. Both are assumed to be 0 and have no impact on the average and mean calculation.

7.2 Relative Valuation

All possible multiples are narrowed down to EV/Sales, EV/EBITDA, EV/EBIT and P/E. The equity multiple price-to-earnings-ratio (P/E or PER) is commonly used because it reflects the price per share. However, different accounting standards or variations in capital structures make the use of enterprise multiples necessary. All multiples can differ from each other for several reasons. Underlying quality drivers, such as strategy and management success or accounting differences can bias results, even with the same operating performance because profit multiples are affected. Fluctuation in profits can also disturb results, e.g., through extraordinary events. Lastly, simple mispricing by the markets can distort results (Cooper et al. 2001). For those reasons, the peer companies are chosen carefully and are smoothed by using the median. Knowing that each of the multiples has advantages and disadvantages, there is no sign that one of them should be neglected. Empirical studies indicate that forward looking multiples demonstrate a more accurate estimation. Moreover, there is no superior multiple for a specific industry, according to Liu et al. (2002). In the following, a chart with all multiples is presented.

		EV/Sales		EV/EBITDA		EV/EBIT		P/E	
		FY18	FY19	FY18	FY19	FY18	FY19	FY18	FY19
Peer Multiple	Weighted Average	2,8x	3,0x	19,0x	20,3x	23,7x	23,9x	27,0x	32,6x
	Average	2,1x	2,3x	15,1x	16,4x	22,5x	22,2x	24,8x	32,6x
	Median	1,6x	1,9x	12,2x	14,7x	20,3x	20,2x	22,7x	30,8x
	1st Quartile	0,8x	1,1x	10,6x	12,7x	14,3x	15,1x	21,6x	22,3x
	3rd Quartile	2,8x	3,0x	23,2x	22,6x	27,3x	26,9x	30,0x	37,6x

		EV/Sales		EV/EBITDA		EV/EBIT		P/E	
		FY0	FY1	FY0	FY1	FY0	FY1	FY0	FY1
Value (€m)	Weighted Average	12 940	15 505	7 947	9 208	7 983	8 645	5 061	7 656
	Average	9 551	11 741	6 336	7 423	7 599	8 062	4 640	7 660
	Median	7 375	9 659	5 114	6 648	6 854	7 329	4 246	7 247
	1st Quartile	3 638	5 466	4 431	5 762	4 822	5 463	4 044	5 247
	3rd Quartile	12 969	15 551	9 740	10 253	9 194	9 747	5 626	8 837

Share Price PUMA		EV/Sales		EV/EBITDA		EV/EBIT		P/E	
		FY0	FY1	FY0	FY1	FY0	FY1	FY0	FY1
Share Price (€)	Weighted Average	853	1 024	519	603	521	565	339	512
	Average	626	772	411	484	495	526	310	512
	Median	480	633	329	432	446	477	284	485
	1st Quartile	230	353	283	372	310	352	271	351
	3rd Quartile	855	1 027	639	673	602	639	376	591

		EV/Sales		EV/EBITDA		EV/EBIT		P/E	
TOTAL	Share price	633		432		477		485	
	Average			**514**				**485**	

Table 13: Relative valuation summary

From the derived enterprise values, items according to the equity bridge are subtracted. As a basis for the final valuation, the median for 1-year forward-looking multiples are used, representing a median price of €633 EV/Sales, €432 for EV/EBITDA, €477 for EV/EBIT and €485 for P/E. The accurate peer group composition and realistic results undermine an adequate comparison to PUMA. For this reason, values obtained from the relative valuation complement the value determined by the DCF.

8 Sum of the parts valuation

Puma closed with a share price of €427.0 as of 31 December 2018. As of 13 February 2019, one day before the issuance of the annual report, the share price traded at €481.5. On basis of the above presented DCF- and multiple valuation, a share price of €505.91 is recommended. Hereby, the DCF counts for 50% and the multiples for another 50%, whereas the equity multiples and the enterprise multiples count for 25% each. A summary is presented below.

Share Price Summary		
	Share price (€)	Weight
DCF	512	50%
Average EV Multiples	514	25%
Equity Multiple	485	25%
Total		**505.91**

Table 14: Share Price Summary
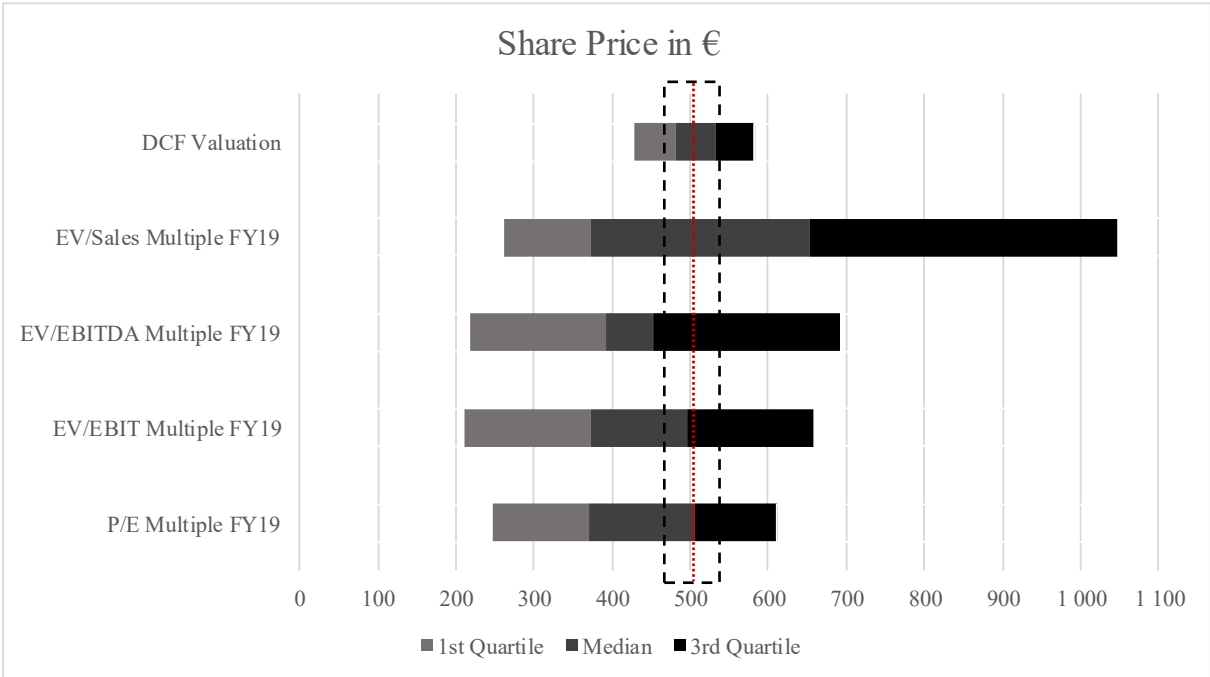
Figure 46: Share Price Summary

PUMA´s share price on basis of financial data as of 31 December 2018 is compared with the share price as of 13 February 2019. The obtained fair value of PUMA´s share price, by including the DCF and multiples approach, is €505.91. Compared to the market value of €481.50 as of 13 February 2019, an upside potential of 5.07% over the next 12 months is concluded. Under consideration of all parts of the valuation, a hold recommendation is issued.

9 Comparison Investment Bank Report

In this section, the main assumptions and results of this dissertation are compared with the equity report of Warburg Research GmbH. Warburg Research is a division of M. M. Warburg & CO, an independent private bank in Germany, based in Hamburg. The choice for the report "The growth champion in its industry" from 19.02.2019 by the analyst Joerg Philipp Frey stems from strong track records in estimate accuracy and recommendation performance with 4/5 stars for each category (Thomson Reuters Eikon 2019).

The report is based on the FY18 figures from PUMA's recently published annual report and presents a price target of €510 (€511.99). Compared with the quoting price of €458.50, it represents an upside potential of 11.1% and thus, a hold recommendation. In this dissertation, the price is compared to the quote on 13 February 2019 at €481.5 and hence, gives an upside potential of 5.07%. The issued price target from Warburg is solely based on a DCF valuation. Multiples are used for verification purposes only.

For the DCF, the forecast is separated into a detailed forecast until FY21 and a transitional period until FY31 with a terminal value growth rate of 1% (2.2%). The sales forecast shows a 4% difference in the estimate in FY28 of this dissertation. The enterprise value of €7997m (€7848m), added by liquidity and subtracted by financial liabilities, pension liabilities and minority interests, receives an equity value of €7638m (€7653m). The WACC of 7.14% (5.85%) is estimated with a debt ratio of 5% (0%) and a cost of debt (after tax) of 3.6% (0%). The cost of equity of 7.14% (5.85%) is formed by a beta of 1.06 (0.79), risk free of 1.5% (0.29%) and market return of 7% (7% + 0.29%). The EBIT margin in terminal value of 10% (6.63%) is higher in the report, mainly due to a lower cost ratio. Due to the differences in the terminal growth rate, similar results are obtained for the enterprise value. The different value for the minority interest (no further information contained) explains the difference in equity value €7638m (€7652m) and thus, the share price €510 (€512). Since Warburg's valuation for PUMA is fully explained by the DCF result, a multiple comparison is unfeasible.[5]

---

[5] Comparing results of this dissertation in brackets ()

Equity Report Camparison		
	Warburg	**Dissertation**
Underlying date	31 Dec 2018	31 Dec 2018
Published	19 Feb 2019	
Intrinsic Valuation Method	DCF	DCF
Relative Valuation Method	N/A	EV/Sales, EV/EBITDA, EV/EBIT, P/E
Recomendation	**Hold**	**Hold**
Explicit Forecast Period	FY19-FY31	FY19-FY27
Debt Ratio	5.00%	6.33%
WACC	**7.14%**	**5.85%**
Tax rate	27.00%	26.57%
Revenue CAGR FY19-FY27	6.83%	7.48%
TV EBIT margin	10.00%	6.63%
Terminal growth rate	**1.00%**	**2.20%**
Enterprise Value (€m)	**7997.00**	**7848.24**
Cash (€m)	464.00	463.70
LT Equity Investments	0.00	0
Debt (€m)	-201.00	-262.60
Pension Liabilities (€m)	-29.00	-29.70
Minority Interest (€m)	-594.00	-366.96
Equity Value (€m)	**7638.00**	**7652.68**
DCF Shareprice	**510.00**	**511.99**
EV/Sales	N/A	634
EV/EBITDA	N/A	432
EV/EBIT	N/A	478
P/E	N/A	485
Recommended Share Price (€)	**510.00**	**505.91**
Upside/Downside	11.20%	5.07%
Underlying value (€)	458.5	481.5

Table 15: Comparison with Warburg Equity Report

10 Conclusion

Two different valuation approaches are applied to receive a fair value share price of PUMA. On the one hand, the DCF valuation yields a price of €511.99, representing an upside potential of 6.33%. On the other hand, the 1-year forward multiple approach including EV/Sales, EV/EBITDA, EV/EBIT and P/E result in a median indicated price of €633.10, €431.71, €477.28 and €484.86, respectively. Both, the DCF and the multiples ranging at levels that confirm their proof of existence and are thus, included for the fair value price. The values obtained by the DCF and multiples are weighted and a price recommendation of €505.91 is issued. Compared to the share price of €481.50 the obtained price demonstrates a 12-month upside potential of 5.07%. Overall, this leads to a hold recommendation for PUMA shares.

The obtained values are based on assumptions that help to forecast future conditions. The sensitivity analysis shows strong changes for small changes in the assumptions. Often, target price recommendation lack accuracy and prediction errors are large and significant (Bonini et al. 2010).

The result and recommendation of this report is just as good as the assumptions made and should be critically scrutinized by potential investors.

11 Appendix

Share of the total sportswear and sports equipment market by sales and market size

20.98%

14.90%

6.81%

40.42%

3.16%

1.62%

1.82%

2.02%   2.59%   2.68%   2.99%

■ Nike ■ Adidas ■ VF* ■ Puma ■ Under Armour ■ Scetchers ■ New Balance ■ Asics ■ Amer Sports ■ Columbia Sportswear ■ Other

*2017
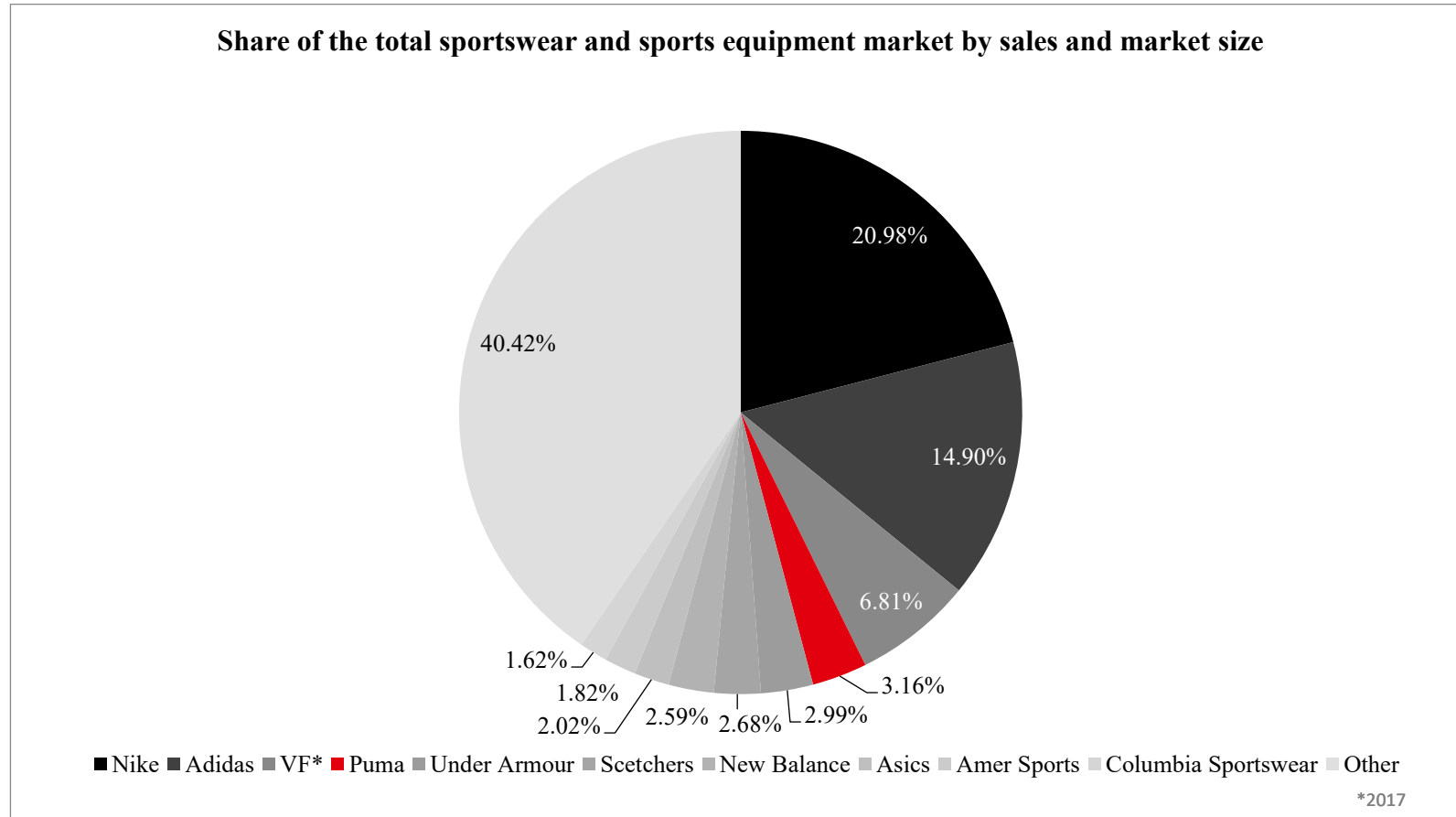
Source: Thomson Reuters Eikon, Statista, own calculation

Appendix 1: Share of the total sportswear and sports equipment market by sales and market size

	IS Reorganized Historical					IS Reorganized Forecast									
	2014	2015	2016	2017	2018	2019E	2020E	2021E	2022E	2023E	2024E	2025E	2026E	2027E	TV
Sales	2,972	3,387	3,627	4,136	4,648	**5,131**	5,644	6,187	6,842	7,453	7,992	8,416	8,703	8,894	9,090
Y-o-Y Growth	*-0.4%*	*14.0%*	*7.1%*	*14.0%*	*12.4%*	10.4%	10.0%	9.6%	10.6%	8.9%	7.2%	5.3%	3.4%	2.2%	2.2%
COGS	-1,587	-1,847	-1,970	-2,182	-2,399	-2,633	-2,885	-3,156	-3,497	-3,824	-4,125	-4,343	-4,492	-4,590	-4,691
% of sales	*53.4%*	*54.5%*	*54.3%*	*52.7%*	*51.6%*	*-51.3%*	*-51.1%*	*-51.0%*	*-51.1%*	*-51.3%*	*-51.6%*	*-51.6%*	*-51.6%*	*-51.6%*	*-51.6%*
Gross Profit	**1,385**	**1,540**	**1,656**	**1,954**	**2,249**	**2,498**	**2,759**	**3,031**	**3,345**	**3,629**	**3,867**	**4,072**	**4,211**	**4,304**	**4,399**
% of sales	*46.6%*	*45.5%*	*45.7%*	*47.3%*	*48.4%*	*48.7%*	*48.9%*	*49.0%*	*48.9%*	*48.7%*	*48.4%*	*48.4%*	*48.4%*	*48.4%*	*48.4%*
Royalty & other Revenues	19	17	16	16	16	16	16	16	16	16	16	16	16	16	16
% of sales	*0.7%*	*0.5%*	*0.4%*	*0.4%*	*0.4%*	*0.3%*	*0.3%*	*0.3%*	*0.2%*	*0.2%*	*0.2%*	*0.2%*	*0.2%*	*0.2%*	*0.2%*
Sales and distribution expenses	-998	-1,140	-1,182	-1,320	-1,524	-1,664	-1,831	-2,007	-2,219	-2,417	-2,592	-2,730	-2,823	-2,885	-2,948
Product management/merchandising	-35	-38	-42	-45	-44	-54	-60	-66	-73	-79	-85	-89	-92	-94	-96
Administrative and general expenses	-215	-250	-269	-307	-328	-375	-412	-452	-500	-544	-584	-615	-636	-649	-664
SG&A	**-1,248**	**-1,428**	**-1,493**	**-1,673**	**-1,896**	-2,093	-2,303	-2,524	-2,792	-3,041	-3,261	-3,433	-3,551	-3,629	-3,709
% of sales	*-42.0%*	*-42.1%*	*-41.2%*	*-40.4%*	*-40.8%*	*-40.8%*	*-40.8%*	*-40.8%*	*-40.8%*	*-40.8%*	*-40.8%*	*-40.8%*	*-40.8%*	*-40.8%*	*-40.8%*
Research and development	-46	-57	-52	-53	-54	-66	-73	-80	-89	-97	-104	-109	-113	-115	-118
% of sales	*-1.6%*	*-1.7%*	*-1.4%*	*-1.3%*	*-1.2%*	*-1.3%*	*-1.3%*	*-1.3%*	*-1.3%*	*-1.3%*	*-1.3%*	*-1.3%*	*-1.3%*	*-1.3%*	*-1.3%*
Total Operating Expenses	-1,294	-1,484	-1,545	-1,726	-1,950	-2,160	-2,376	-2,604	-2,880	-3,137	-3,364	-3,542	-3,663	-3,744	-3,826
% of sales	*-43.5%*	*-43.8%*	*-42.6%*	*-41.7%*	*-41.9%*	*-42.1%*	*-42.1%*	*-42.1%*	*-42.1%*	*-42.1%*	*-42.1%*	*-42.1%*	*-42.1%*	*-42.1%*	*-42.1%*
Other Operating Income	17	24	1	0	21	8	9	10	11	12	13	14	14	14	15
% of sales	*0.6%*	*0.7%*	*0.0%*	*0.0%*	*0.5%*	*0.2%*	*0.2%*	*0.2%*	*0.2%*	*0.2%*	*0.2%*	*0.2%*	*0.2%*	*0.2%*	*0.2%*
Total operating costs/expenses	**-1,277**	**-1,461**	**-1,545**	**-1,726**	**-1,928**	**-2,152**	**-2,367**	**-2,594**	**-2,869**	**-3,125**	**-3,351**	**-3,529**	**-3,649**	**-3,730**	**-3,812**
% of sales	*-43.0%*	*-43.1%*	*-42.6%*	*-41.7%*	*-41.5%*	*-41.9%*	*-41.9%*	*-41.9%*	*-41.9%*	*-41.9%*	*-41.9%*	*-41.9%*	*-41.9%*	*-41.9%*	*-41.9%*
Thereof D&A & Scheduled expenses	-58	-58	-60	-70	-82	-91	-98	-106	-117	-128	-137	-144	-149	-153	-156
% of sales	-1.9%	-1.7%	-1.7%	-1.7%	-1.8%	-1.8%	-1.7%	-1.7%	-1.7%	-1.7%	-1.7%	-1.7%	-1.7%	-1.7%	-1.7%
EBITDA	**186**	**154**	**188**	**315**	**419**	**454**	**507**	**559**	**609**	**647**	**669**	**704**	**727**	**743**	**759**
EBITDA Margin	*6.3%*	*4.5%*	*5.2%*	*7.6%*	*9.0%*	*8.8%*	*9.0%*	*9.0%*	*8.9%*	*8.7%*	*8.4%*	*8.4%*	*8.4%*	*8.4%*	*8.3%*
Operating result (EBIT)	**128**	**96**	**128**	**245**	**337**	**363**	**409**	**453**	**492**	**520**	**532**	**559**	**578**	**590**	**603**
Y-o-Y Growth		*-24.8%*	*32.6%*	*91.7%*	*37.9%*	*7.6%*	*12.7%*	*10.8%*	*8.7%*	*5.6%*	*2.4%*	*5.1%*	*3.3%*	*2.1%*	*2.1%*
EBIT Margin	*4.3%*	*2.8%*	*3.5%*	*5.9%*	*7.3%*	*7.1%*	*7.2%*	*7.3%*	*7.2%*	*7.0%*	*6.7%*	*6.6%*	*6.6%*	*6.6%*	*6.6%*
Financial income/income from others	6	12	12	12	10	11	11	11	11	11	11	11	11	11	11
Interest expenses	-10	-14	-13	-14	-15	-23	-25	-27	-29	-31	-34	-36	-39	-42	-44
% financial expenses	-13.8%	-10.5%	-12.0%	-9.2%	-5.8%	-8.4%	-8.4%	-8.4%	-8.4%	-8.4%	-8.4%	-8.4%	-8.4%	-8.5%	-8.5%
Other financial expenses	-3	-9	-7	-11	-19	-18	-19	-21	-22	-24	-26	-28	-30	-32	-34
% of financial expenses	-3.5%	-6.6%	-6.3%	-7.2%	-7.3%	-6.5%	-6.4%	-6.4%	-6.4%	-6.4%	-6.4%	-6.5%	-6.5%	-6.5%	-6.5%
Financial expenses	**-6**	**-11**	**-9**	**-13**	**-24**	**-30**	**-33**	**-36**	**-40**	**-44**	**-48**	**-53**	**-57**	**-62**	**-67**
% of sales	*-0.2%*	*-0.3%*	*-0.2%*	*-0.3%*	*-0.5%*	*-0.6%*	*-0.6%*	*-0.6%*	*-0.6%*	*-0.6%*	*-0.6%*	*-0.6%*	*-0.7%*	*-0.7%*	*-0.7%*
Earnings before Taxes (EBT)	**122**	**85**	**119**	**231**	**313**	**393**	**442**	**489**	**532**	**564**	**580**	**612**	**635**	**653**	**670**
EBT Margin	4.1%	2.5%	3.3%	5.6%	6.7%	7.7%	7.8%	7.9%	7.8%	7.6%	7.3%	7.3%	7.3%	7.3%	7.4%
Taxes on income	-37.0	-23.3	-30.5	-63.3	-83.6	-104.3	-117.3	-129.9	-141.4	-149.8	-154.2	-162.6	-168.8	-173.4	-178.1
Consolidated net earnings	**85**	**62**	**88**	**168**	**230**	**288**	**324**	**359**	**391**	**414**	**426**	**449**	**467**	**479**	**492**
Minority interest	-21	-25	-26	-32	-42	-53	-60	-66	-72	-76	-79	-83	-86	-88	-91
% of net income	*24.4%*	*39.9%*	*29.4%*	*19.2%*	*18.5%*	*18.5%*	*18.5%*	*18.5%*	*18.5%*	*18.5%*	*18.5%*	*18.5%*	*18.5%*	*18.5%*	*18.5%*
Net Income	**64**	**37**	**62**	**136**	**187**	**235**	**264**	**293**	**319**	**337**	**347**	**367**	**380**	**391**	**401**
Net Income Margin	*2.2%*	*1.1%*	*1.7%*	*3.3%*	*4.0%*	*5.6%*	*5.7%*	*5.8%*	*5.7%*	*5.6%*	*5.3%*	*5.3%*	*5.4%*	*5.4%*	*5.4%*
Y-o-Y Growth		-42.1%	68.2%	117.5%	38.0%	25.5%	12.5%	10.7%	8.8%	5.9%	3.0%	5.5%	3.8%	2.7%	2.7%

Appendix 2: Income Statement (reorganized)

€ m	Balance Sheet					Balance Sheet Forecast									
	2014	2015	2016	2017	2018	2019E	2020E	2021E	2022E	2023E	2024E	2025E	2026E	2027E	TV
Cash and cash equivalents	402	339	327	415	464	385	408	443	467	523	612	761	972	1226	1487
Inventories	572	657	719	779	915	968	1061	1161	1286	1406	1517	1597	1652	1688	1725
Trade receivables	449	483	499	504	554	647	712	781	863	940	1008	1062	1098	1122	1147
Income tax receivables	75	51	37	27	34	37	41	45	50	54	58	61	63	65	66
Other current financial assets	94	77	114	67	111	111	111	111	111	111	111	111	111	111	111
Other current assets	92	79	69	94	115	115	115	115	115	115	115	115	115	115	115
Current Assets	**1683**	**1685**	**1766**	**1885**	**2193**	**2265**	**2448**	**2656**	**2893**	**3150**	**3422**	**3708**	**4012**	**4328**	**4652**
Deferred income taxes	179	220	230	208	208	271	298	326	361	393	421	444	459	469	479
Property, plant & equipment	224	233	252	260	295	355	378	404	447	486	522	549	568	580	593
Intangible assets	391	403	423	413	438	491	564	641	708	772	827	871	901	921	941
PP&E/Intangible	2	2	2	2	1	1	1	2	2	2	2	2	2	2	2
Investments in associates	15	15	17	17	0	0	0	0	0	0	0	0	0	0	0
Other non-current financial assets	35	39	60	52	65	65	65	65	65	65	65	65	65	65	65
Other non-current assets	23	25	19	20	9	9	9	9	9	9	9	9	9	9	9
Non-current assets	**869**	**937**	**1002**	**971**	**1016**	**1193**	**1317**	**1447**	**1592**	**1727**	**1847**	**1941**	**2004**	**2047**	**2090**
Total Assets	**2552**	**2622**	**2767**	**2856**	**3209**	**3458**	**3765**	**4103**	**4485**	**4878**	**5269**	**5649**	**6016**	**6374**	**6742**
Current Financial Liabilities	20	14	25	29	21	21	21	21	21	21	21	21	21	21	21
Trade payables	515	520	581	646	705	777	851	931	1031	1128	1217	1281	1325	1354	1384
Income taxes (payables)	59	50	41	55	68	75	83	91	100	109	117	123	127	130	133
Other current provisions	70	53	56	86	40	40	40	40	40	40	40	40	40	40	40
Liabilities from acquisitions	1	3													
Other current financial liabilities	51	116	70	95	57	57	57	57	57	57	57	57	57	57	57
Other current liabilities	108	125	122	146	305	305	305	305	305	305	305	305	305	305	305
Current liabilities	**823**	**880**	**895**	**1056**	**1195**	**1274**	**1355**	**1443**	**1553**	**1659**	**1755**	**1826**	**1874**	**1906**	**1939**
Deferred taxes	55	64	63	38	48	63	69	76	84	91	98	103	107	109	111
Pension provisions	26	24	32	30	29	29	29	29	29	29	29	29	29	29	29
Other non-current liabilities	23	24	30	35	26	26	26	26	26	26	26	26	26	26	26
Non-current financial liabilities															
Liabilities from Acquisitions	3	0	5	5	3	3	3	3	3	3	3	3	3	3	3
Other non-current financial liabilities	0	7	16	31	181	199	220	244	269	296	323	353	383	414	446
Other non-current liabilities	3	2	2	3	3	3	3	3	3	3	3	3	3	3	3
Non-current liabilities	**109**	**121**	**148**	**141**	**290**	**324**	**351**	**381**	**414**	**448**	**483**	**517**	**551**	**584**	**619**
Subscribed capital	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39
Group reserves	176	163	203	51	147	147	147	147	147	147	147	147	147	147	147
Retained earnings	1412	1442	1497	1566	1547	1723	1921	2141	2380	2633	2893	3168	3454	3747	4048
Treasury Stock	-31	-31	-31	-30	-29	-29	-29	-29	-29	-29	-29	-29	-29	-29	-29
Equity attributable to the sharehol	**1595**	**1611**	**1707**	**1626**	**1703**	**1880**	**2078**	**2297**	**2536**	**2789**	**3050**	**3325**	**3610**	**3903**	**4204**
Non-controlling interest	23	8	15	31	19	19	19	19	19	19	19	19	19	19	19
Shareholders' equity	**1618**	**1619**	**1722**	**1657**	**1722**	**1861**	**2059**	**2279**	**2517**	**2771**	**3031**	**3306**	**3591**	**3884**	**4185**
Total liabilities and shareholders's	**2550**	**2620**	**2765**	**2854**	**3207**	**3458**	**3765**	**4103**	**4485**	**4878**	**5269**	**5649**	**6016**	**6374**	**6742**

Appendix 3: Balance Sheet

Capital Structure Historical						Capital Structure Forecast									
€m	2014	2015	2016	2017	2018	2019E	2020E	2021E	2022E	2023E	2024E	2025E	2026E	2027E	TV
Current financial liabilities	19,8	14,0	25,3	29,0	20,5	20,5	20,5	20,5	20,5	20,5	20,5	20,5	20,5	20,5	20,5
Liabilities from finance lease ST (up to 1Y)	0,4	0,5	0,4	0,3	0,8	0,8	0,8	0,8	0,8	0,8	0,8	0,8	0,8	0,8	0,8
OTHER non current FL	0,3	7,2	16,2	31,0	180,6	199,3	220,3	243,6	268,9	295,8	323,4	352,5	382,8	413,9	445,8
Total Debt	-20,1	-21,2	-41,5	-60,0	-201,1	-219,8	-240,8	-264,1	-289,4	-316,3	-343,9	-373,0	-403,3	-434,4	-466,3
Cash&Equivalent	401,5	338,8	326,7	415,0	463,7	386,7	409,5	444,4	468,7	524,6	613,9	763,1	973,5	1227,6	1488,9
Net debt	-381,4	-317,6	-285,2	-355,0	-262,6	-166,9	-168,6	-180,3	-179,2	-208,3	-270,0	-390,0	-570,2	-793,2	-1022,6
Total Equity	1595,2	1611,4	1707,0	1625,5	1703,3	1879,6	2077,9	2297,4	2536,3	2789,4	3050,0	3324,9	3610,2	3903,2	4204,1
D/E ratio	1,3%	1,3%	2,4%	3,7%	11,8%	11,7%	11,6%	11,5%	11,4%	11,3%	11,3%	11,2%	11,2%	11,1%	11,1%
Net debt/Equity	-23,6%	-19,7%	-16,7%	-21,8%	-15,4%	-8,9%	-8,1%	-7,8%	-7,1%	-7,5%	-8,9%	-11,7%	-15,8%	-20,3%	-24,3%
Only interest	-9,8	-14,4	-13,4	-14,3	-15,1	-23,3	-25,0	-26,9	-29,0	-31,3	-33,7	-36,2	-38,9	-41,6	-44,4
%only interest payments debt	48,8%	67,9%	32,3%	23,8%	7,5%	10,6%	10,4%	10,2%	10,0%	9,9%	9,8%	9,7%	9,6%	9,6%	9,5%

Appendix 4: Capital Structure

AP / AR / Inventory Historical							AP / AR / Inventory Forecast									
€m	2013	2014	2015	2016	2017	2018	2019E	2020E	2021E	2022E	2023E	2024E	2025E	2026E	2027E	TV
Revenues		2,972	3,387	3,627	4,136	4,648	5,131	5,644	6,187	6,842	7,453	7,992	8,416	8,703	8,894	9,090
Days	365															
A/R - DSO																
Revenues		2,972	3,387	3,627	4,136	4,648	5,131	5,644	6,187	6,842	7,453	7,992	8,416	8,703	8,894	9,090
A/R		449	483	499	504	554	647	712	781	863	940	1,008	1,062	1,098	1,122	1,147
DSO		**55**	**52**	**50**	**44**	**43**	**46**	**46**	**46**	**46**	**46**	**46**	**46**	**46**	**46**	**46**
% of Sales		15%	14%	14%	12%	12%	13%	13%	13%	13%	13%	13%	13%	13%	13%	13%
A/P - DPO																
A/P		515	520	581	646	705	777	851	931	1031	1128	1217	1281	1325	1354	1384
COGS		1587	1847	1970	2182	2399	2633	2885	3156	3497	3824	4125	4343	4492	4590	4691
DPO		**119**	**103**	**108**	**108**	**107**	**108**	**108**	**108**	**108**	**108**	**108**	**108**	**108**	**108**	**108**
GOGS		7.5%	5.6%	5.5%	5.0%	4.5%	15.1%	15.1%	15.0%	15.1%	15.1%	15.2%	15.2%	15.2%	15.2%	15.2%
Inventory - DHI																
COGS		1,587	1,847	1,970	2,182	2,399	2,633	2,885	3,156	3,497	3,824	4,125	4,343	4,492	4,590	4,691
Inventory		572	657	719	779	915	968	1,061	1,161	1,286	1,406	1,517	1,597	1,652	1,688	1,725
DHI		**131**	**130**	**133**	**130**	**139**	**134**	**134**	**134**	**134**	**134**	**134**	**134**	**134**	**134**	**134**
% of Sales		36%	36%	36%	36%	38%	37%	37%	37%	37%	37%	37%	37%	37%	37%	37%
Cash Conversion Cycle		**68.1**	**79.2**	**75.9**	**66.6**	**75.4**	**72.6**	**72.6**	**72.6**	**72.6**	**72.6**	**72.6**	**72.6**	**72.6**	**72.6**	**72.6**

Appendix 5: AP / AR / Inventories Forecast

	GDP - Current Prices Actual					GDP Current Prices Expected				
Region	**2014**	**2015**	**2016**	**2017**	**2018**	**2019E**	**2020E**	**2021E**	**2022E**	**2023E**
GDP, current prices ($bn)										
Africa (Region)	2489	2270	2149	2181	2327	2507	2714	2908	3132	3389
Europe	22296	19135	19115	20272	21820	22319	23366	24319	25390	26442
Middle East (Region)	2737	2374	2382	2562	2810	2834	2939	3048	3175	3313
EMEA	**27522**	**23779**	**23646**	**25015**	**26957**	**27660**	**29020**	**30275**	**31696**	**33144**
Asia and Pacific	**25828**	**25693**	**26594**	**28213**	**30223**	**31652**	**34091**	**36552**	**39154**	**41898**
Central America	217	232	245	259	271	286	304	322	341	362
North America	20738	21053	21425	22394	23551	24650	25638	26631	27616	28625
South America	4317	3644	3540	3956	3606	3594	3779	3971	4174	4387
AMERICAS	**25272**	**24929**	**25210**	**26609**	**27428**	**28529**	**29721**	**30924**	**32131**	**33375**

©IMF, 2018

	Real GDP growth Actual					Real GDP growth Expected				
Region	**2014**	**2015**	**2016**	**2017**	**2018**	**2019E**	**2020E**	**2021E**	**2022E**	**2023E**
Africa (Region)	4.0%	3.4%	2.1%	3.5%	3.4%	3.9%	4.0%	4.0%	4.0%	4.1%
Europe	1.6%	1.4%	1.7%	2.5%	2.2%	2.0%	1.9%	1.8%	1.7%	1.6%
Middle East (Region)	3.0%	1.9%	5.9%	0.7%	1.3%	1.9%	2.5%	2.5%	2.6%	2.5%
EMEA	**2.0%**	**1.6%**	**2.2%**	**2.4%**	**2.2%**	**2.2%**	**2.2%**	**2.1%**	**2.0%**	**1.9%**
Asia and Pacific	**5.6%**	**5.6%**	**5.3%**	**5.7%**	**5.5%**	**5.2%**	**5.3%**	**5.3%**	**5.2%**	**5.2%**
Central America	4.1%	4.2%	3.8%	3.7%	2.8%	3.8%	4.0%	3.9%	3.9%	3.9%
North America	2.5%	2.8%	1.7%	2.2%	2.7%	2.5%	1.9%	1.8%	1.6%	1.6%
South America	0.6%	-1.1%	-2.4%	0.7%	0.6%	1.9%	2.5%	2.5%	2.6%	2.7%
AMERICAS	**2.2%**	**2.2%**	**1.1%**	**2.0%**	**2.4%**	**2.4%**	**2.0%**	**1.9%**	**1.8%**	**1.8%**
Total	**3.2%**	**3.2%**	**2.9%**	**3.4%**	**3.4%**	**3.3%**	**3.2%**	**3.1%**	**3.0%**	**3.0%**

	Inflation rate, average consumer prices (Annual percent c					Inflation rate, average consumer prices (Annual pe				
	2014	**2015**	**2016**	**2017**	**2018**	**2019E**	**2020E**	**2021E**	**2022E**	**2023E**
Germany	**0.8%**	**0.7%**	**0.4%**	**1.7%**	**1.9%**	**1.3%**	**1.7%**	**1.9%**	**2.2%**	**2.2%**

	Nominal GDP growth Actual					Nominal GDP growth Expected				
Region	**2014**	**2015**	**2016**	**2017**	**2018**	**2019E**	**2020E**	**2021E**	**2022E**	**2023E**
EMEA	**2.8%**	**2.4%**	**2.6%**	**4.1%**	**4.2%**	**3.5%**	**3.9%**	**4.0%**	**4.3%**	**4.2%**
Asia and Pacific	**5.6%**	**5.6%**	**5.3%**	**5.7%**	**5.5%**	**6.6%**	**7.1%**	**7.3%**	**7.5%**	**7.5%**
AMERICAS	**3.0%**	**3.0%**	**1.5%**	**3.7%**	**4.4%**	**3.8%**	**3.7%**	**3.8%**	**4.0%**	**4.0%**

	PUMA Share by Region Actual					PUMA Share by Region Expected				
Region	**2014**	**2015**	**2016**	**2017**	**2018**	**2019E**	**2020E**	**2021E**	**2022E**	**2023E**
PUMA GROWTH in Region GDP										
EMEA	**1206**	**1258**	**1383**	**1646**	**1800**					
Growth	1%	4%	10%	19%	9%					
Accounted for	41%	37%	38%	40%	39%	39%	39%	39%	39%	39%
Asia/Pacific	**696**	**818**	**905**	**995**	**1236**					
Growth	2%	18%	11%	10%	24%					
Accounted for	23%	24%	25%	24%	27%	27%	27%	27%	27%	27%
Americas	**1069.9**	**1310.8**	**1339.6**	**1494.8**	**1612.5**					
Growth	7%	23%	8%	12%	8%					
Accounted for	36%	39%	37%	36%	35%	35%	35%	35%	35%	35%
	100%	100%	100%	100%	100%					
TOTAL	**2972**	**3387**	**3627**	**4136**	**4648**					

	Real GDP growth Expected Puma Weighted					Real GDP growth Expected Puma Weighted				
Region	**2014**	**2015**	**2016**	**2017**	**2018**	**2019E**	**2020E**	**2021E**	**2022E**	**2023E**
EMEA	**0.8%**	**0.6%**	**0.8%**	**1.0%**	**0.9%**	**0.8%**	**0.8%**	**0.8%**	**0.8%**	**0.8%**
Asia/Pacific	**1.3%**	**1.4%**	**1.3%**	**1.4%**	**1.5%**	**1.4%**	**1.4%**	**1.4%**	**1.4%**	**1.4%**
Americas	**0.8%**	**0.9%**	**0.4%**	**0.7%**	**0.8%**	**0.8%**	**0.7%**	**0.7%**	**0.6%**	**0.6%**
TOTAL	**2.9%**	**2.8%**	**2.6%**	**3.0%**	**3.2%**	**3.1%**	**2.9%**	**2.9%**	**2.8%**	**2.8%**

	Nominal GDP growth Expected Puma Weighted					Nominal GDP growth Expected Puma Weighted				
Region	**2014**	**2015**	**2016**	**2017**	**2018**	**2019E**	**2020E**	**2021E**	**2022E**	**2023E**
EMEA	**1.1%**	**0.9%**	**1.0%**	**1.6%**	**1.6%**	**1.4%**	**1.5%**	**1.6%**	**1.6%**	**1.6%**
Asia/Pacific	**1.3%**	**1.4%**	**1.3%**	**1.4%**	**1.5%**	**1.7%**	**1.9%**	**1.9%**	**2.0%**	**2.0%**
Americas	**1.1%**	**1.1%**	**0.6%**	**1.3%**	**1.5%**	**1.3%**	**1.3%**	**1.3%**	**1.4%**	**1.4%**
TOTAL	**3.52%**	**3.37%**	**2.88%**	**4.37%**	**4.59%**	**4.41%**	**4.69%**	**4.83%**	**5.03%**	**5.01%**

Appendix 6: Weighted nominal GDP Forecast

Forecast Summary	Historical					Forecast										Multiplier
	2014	2015	2016	2017	2018	2019E	2020E	2021E	2022E	2023E	2024E	2025E	2026E	2027E	TV	
PUMA Growth Historical & Estimat	-0.40%	13.98%	7.06%	14.04%	12.39%	10.39%	9.99%	9.62%	10.60%	8.92%	7.24%	5.30%	3.41%	2.20%	2.20%	
Market Growth	3.55%	2.68%	4.58%	4.38%	4.19%	4.02%	3.87%	3.72%	4.10%	3.94%	3.90%	3.90%				
Multiplier	*0.00*	*5.21*	*1.54*	*3.21*	*2.96*	*2.58*	*2.58*	*2.58*	*2.58*							2.58
Growth Forecast Industry	*-0.40%*	*13.98%*	*7.06%*	*14.04%*	*12.39%*	**10.39%**	**9.99%**	**9.62%**	**10.60%**	**8.92%**	**7.24%**	**5.30%**	**3.41%**	**2.20%**	**2.20%**	
Robustness Check																
Nominal GDP	3.52%	3.37%	2.88%	4.37%	4.59%	4.41%	4.69%	4.83%	5.03%	5.01%						
Multiplier GDP	0.00	4.14	2.46	3.21	2.70	2.50	2.50	2.50	2.50	2.50						2.50
Growth Forecast GDP (Robustness)						11.03%	11.74%	12.10%	12.60%	10.52%	8.44%	6.36%	4.28%	2.20%	2.20%	
Management Case						10.0%	10.0%	10.0%	10.0%							

Appendix 7: Revenue Forecast Summary

MDAX
SUMMARY OUTPUT

Regression Statistics
Multiple R	0.372957
R Square	0.1390969
Adjusted R	0.1357601
Standard Er	0.0362826
Observation	260

ANOVA
	df	SS	MS	F	ignificance F
Regression	1	0.0548757	0.0548757	41.68531	5.289E-10
Residual	258	0.3396384	0.0013164		
Total	259	0.3945141			

	Coefficients	andard Erro	t Stat	P-value	Lower 95%	Upper 95%	Lower 95,0%	Upper 95,0%
Intercept	0.0031286	0.0022575	1.3858758	0.1669815	-0.001317	0.007574	-0.001317	0.007574
X Variable	0.6771579	0.1048814	6.4564162	5.289E-10	0.4706253	0.8836905	0.4706253	0.8836905

MSCI World
SUMMARY OUTPUT

Regression Statistics
Multiple R	0.3241238
R Square	0.1050562
Adjusted R	0.1015874
Standard Er	0.036993
Observation	260

ANOVA
	df	SS	MS	F	ignificance F
Regression	1	0.0414462	0.0414462	30.286264	8.983E-08
Residual	258	0.3530679	0.0013685		
Total	259	0.3945141			

	Coefficients	andard Erro	t Stat	P-value	Lower 95%	Upper 95%	Lower 95,0%	Upper 95,0%
Intercept	0.0035489	0.0022983	1.5441511	0.1237774	-0.000977	0.0080746	-0.000977	0.0080746
X Variable	0.7511672	0.1364941	5.5032957	8.983E-08	0.4823829	1.0199515	0.4823829	1.0199515

Appendix 8: Beta regression output

	Company Name	Fiscal Year End Date	TRBC Industry	Price	Market Cap	Total Debt	Cash
NKE.N	Nike Inc	31/05/2018	Footwear	74.73	117,464	3,067	3,558
ITX.MC	Industria de Diseno Textil SA	31/01/2019	Apparel & Accessories Retailers	25.19	78,508	89	6,815
HRMS.PA	Hermes International SCA	31/12/2018	Apparel & Accessories	608.60	64,250	50	3,479
PRTP.PA	Kering SA	31/12/2018	Apparel & Accessories Retailers	507.10	63,962	3,928	2,278
TJX.N	TJX Companies Inc	02/02/2019	Discount Stores	48.29	58,655	1,950	2,646
VFC.N	VF Corp	31/03/2018	Apparel & Accessories	82.71	32,721	2,465	468
CFR.S	Compagnie Financiere Richemont S.	31/03/2018	Apparel & Accessories	62.64	32,589	9,084	10,668
HMb.ST	H & M Hennes & Mauritz AB	30/11/2018	Apparel & Accessories Retailers	14.72	21,420	1,958	1,129
LULU.OQ	Lululemon Athletica Inc	03/02/2019	Apparel & Accessories	154.62	20,142	0	769
UHR.S	The Swatch Group AG	31/12/2018	Apparel & Accessories	251.42	13,715	200	1,102
TIF.N	Tiffany & Co	31/01/2019	Apparel & Accessories Retailers	93.34	11,333	871	747
BURL.N	Burlington Stores Inc	02/02/2019	Discount Stores	147.31	9,785	861	98
ZALG.DE	Zalando SE	31/12/2018	Apparel & Accessories Retailers	38.87	9,758	513	917
KSS.N	Kohls Corp	02/02/2019	Department Stores	59.70	9,741	3,055	815
MONC.MI	Moncler SpA	31/12/2018	Apparel & Accessories	36.67	9,448	96	547
BRBY.L	Burberry Group PLC	31/03/2018	Apparel & Accessories Retailers	22.24	9,159	20	746
NXT.L	Next PLC	26/01/2019	Miscellaneous Specialty Retailers	65.10	8,889	1,484	181
RL.N	Ralph Lauren Corp	31/03/2018	Apparel & Accessories	110.63	8,698	810	1,804
PUMG.DE	Puma SE	31/12/2018	Footwear	553.50	8,338	257	420
TPR.N	Tapestry Inc	30/06/2018	Apparel & Accessories Retailers	28.71	8,330	1,428	1,192
UAA.N	Under Armour Inc	31/12/2018	Apparel & Accessories	19.40	8,228	526	257
PVH.N	PVH Corp	03/02/2019	Apparel & Accessories	106.28	7,976	2,473	395
1913.HK	Prada SpA	31/12/2018	Apparel & Accessories Retailers	2.71	6,922	909	600
COLM.OQ	Columbia Sportswear Co	31/12/2018	Apparel & Accessories	85.82	5,861	0	627
FL.N	Foot Locker Inc	02/02/2019	Apparel & Accessories Retailers	51.30	5,762	108	778
CPRI.N	Capri Holdings Ltd	31/03/2018	Apparel & Accessories Retailers	38.09	5,741	2,216	231
JWN.N	Nordstrom Inc	02/02/2019	Department Stores	35.05	5,431	2,344	836
FIEG.DE	Fielmann AG	31/12/2018	Miscellaneous Specialty Retailers	62.15	5,221	381	360
MKS.L	Marks and Spencer Group PLC	31/03/2018	Miscellaneous Specialty Retailers	3.14	5,105	2,034	219
GVNV.AS	Grandvision NV	31/12/2018	Miscellaneous Specialty Retailers	19.00	4,829	878	138
BOSSn.DE	Hugo Boss AG	31/12/2018	Apparel & Accessories	59.74	4,201	1,249	123
SKX.N	Skechers USA Inc	31/12/2018	Footwear	26.23	4,128	98	699
DECK.N	Deckers Outdoor Corp	31/03/2018	Footwear	130.08	3,789	28	450
PNDORA.CO	Pandora A/S	31/12/2018	Apparel & Accessories	37.08	3,701	1,630	110
ASOS.L	ASOS PLC	31/08/2018	Department Stores	43.34	3,639	70	26
SFER.MI	Salvatore Ferragamo SpA	31/12/2018	Apparel & Accessories	19.36	3,264	37	208
DKS.N	Dick's Sporting Goods Inc	02/02/2019	Miscellaneous Specialty Retailers	32.54	3,091	52	99
SHOO.OQ	Steven Madden Ltd	31/12/2018	Footwear	29.48	2,530	0	198
WWW.N	Wolverine World Wide Inc	29/12/2018	Footwear	27.92	2,478	688	72

Appendix 9: Peer Selection Total

Identifier	Company Name	Rank	Market Cap (€bn)	Metric	Rank		Revenue (€bn)	Metric	Rank	EBITDA (€m)	Metric	Rank	EBITDA Margin	Metric	Rank	ROIC	Metric	Rank	EPS	Metric	Rank	LT-Growth	Metric	Rank	Net Debt (€m)	Metric	Rank	Total	Metric
BOSSn.DE	Hugo Boss AG	3	4.21	0.50	1	1	2.80	0.40	1	493.92	0.18	1				24.4%	45.8%	1	3.42	72.7%	1	8.2%	68.5%	2	-5.33	98.2%	1	8.00	1.00
UAA.N	Under Armour Inc	1	8.23	0.01	1	1	4.53	0.03	1	296.37	0.29	1	6.8%	24.8%	1	7.5%	55.3%	2	-0.09	100.7%	3	38.0%	45.8%	1	149.47	149.8%	2	12.00	1.50
DKS.N	Dick's Sporting Goods Inc	3	3.09	0.63	2	1	7.37	0.58	1	601.16	0.43	1	8.1%	10.5%	1	18.0%	7.5%	2	2.87	77.1%	3	-1.3%	104.8%	3	-46.80	84.4%	1	12.00	1.50
SKX	Skechers USA Inc	2	4.13	0.51	2	1	4.05	0.13	1	477.33	0.14	1	12.0%	33.0%	1	31.0%	85.0%	3	1.69	86.5%	2				-763.16	154.1%	1	11.00	1.57
DECK.K	Deckers Outdoor Corp	2	3.79	0.55	2	1	1.54	0.67	2	218.22	0.48	1	10.9%	21.5%	1	34.2%	104.3%	3	3.05	75.6%	2	13.9%	46.6%	1	-322.93	7.5%	1	13.00	1.63
RL	Ralph Lauren Corp	3	8.70	0.04	2	1	5.02	0.08	1	778.34	0.85	2	14.4%	59.7%	2	24.7%	47.7%	2	1.68	86.6%	2	11.9%	54.2%	2	-934.91	211.3%	1	13.00	1.63
COLM.OQ	Columbia Sportswear Co	1	5.86	0.30	1	1	2.44	0.47	1	356.80	0.15	1	14.8%	64.5%	1	36.6%	118.9%	3	3.36	73.2%	1	7.9%	69.7%	3	-610.89	103.4%	1	13.00	1.63
ASOS.L	ASOS PLC	3	3.63	0.56	2	1	2.70	0.42	1	178.79	0.57	2	5.4%	39.4%	2	20.8%	24.2%	1	1.12	91.1%	2	7.2%	72.4%	2	-47.71	84.1%	1	13.00	1.63
SHOO.O	Steven Madden Ltd	2	2.53	0.70	2	1	1.44	0.69	2	170.78	0.59	2	12.0%	33.7%	1	28.3%	69.3%	2	1.32	89.5%	2				-232.80	22.5%	1	12.00	1.71
2331.HK	Li Ning Co Ltd	2	3.54	0.58	2	1	1.33	0.71	2	145.16	0.65	2	11.1%	23.2%	1				0.04	99.7%	3	35.6%	36.8%	1	-465.61	55.0%	1	12.00	1.71
ADSGn.DE	Adidas AG	1	50.50	5.05	3	1	21.92	3.71	3	2,948.00	6.02	3	13.8%	53.7%	1				8.42	32.9%	1	15.2%	41.5%	1	-1,192.00	296.9%	1	12.00	1.71
LULU.O	Lululemon Athletica Inc	1	20.14	1.41	3	1	2.87	0.38	1	721.88	0.72	2	24.0%	167.1%	2	89.5%	435.2%	3	3.21	74.4%	1	18.9%	27.4%	1	-769.45	156.2%	1	14.00	1.75
NKE.N	Nike Inc	1	117.46	13.07	3	1	31.14	5.70	2	4,464.49	9.62	3	14.3%	58.7%	1	24.5%	46.5%	1	1.01	91.9%	2	14.0%	46.1%	1	-1,227.54	308.8%	1	14.00	1.75
7936.T	Asics Corp	1	2.05	0.75	2	1	3.08	0.34	1	173.05	0.59	2	4.1%	54.1%	1	2.1%	87.4%	3	-0.86	106.9%	3				-86.75	71.1%	1	13.00	1.86
VFC.N	VF Corp	2	32.72	2.92	3	1	2.47	0.47	1	0.00			15.6%	73.2%	2	17.2%	2.8%	1	0.53	95.8%	3	13.4%	48.6%	1	2,486.13	927.9%	2	13.00	1.86
HRMS.PA	Hermes International SCA	3	64.25	6.70	3	1	5.97	0.28	1	2,303.00	4.48	3	38.6%	329.2%	3				13.39	6.8%	1	8.5%	67.5%	2	-3,429.10	1,041.9%	2	15.00	2.14
HMb.ST	H & M Hennes & Mauritz AB	3	21.51	1.58	3	1	20.42	3.39	2	2,442.55	4.81	3	11.8%	30.7%	1				0.74	94.1%	3	-2.4%	109.2%	3	795.06	364.8%	2	17.00	2.43

Appendix 10: Peer Selection (narrowed)

€m	Change Net Working Capital Historical						Change Net Working Capital Forecast									
	2013	2014	2015	2016	2017	2018	2019E	2020E	2021E	2022E	2023E	2024E	2025E	2026E	2027E	TV
Inventories	521,4	571,5	657	718,9	778,5	915,1	968,2	1060,8	1160,5	1286,0	1406,2	1516,8	1597,1	1651,7	1688,0	1725,2
Trade Receivables	423,4	449,2	483,1	499,2	503,7	553,7	647,5	712,2	780,7	863,4	940,4	1008,5	1061,9	1098,2	1122,3	1147,0
Income tax receivables	70,8	75	50,5	37,4	26,8	33,9	37,42	41,16	45,12	49,90	54,35	58,29	61,37	63,47	64,87	66,29
Deferred income taxes	164,2	178,8	219,8	229,5	207,9	207,6	270,61	297,64	326,27	360,84	393,02	421,47	443,81	458,96	469,06	479,38
Trade Payables	-373	-515,2	-519,7	-580,6	-646,1	-705,3	-776,6	-850,8	-930,8	-1031,5	-1127,9	-1216,6	-1281,0	-1324,8	-1353,9	-1383,7
Income taxes (payables)	-45,6	-58,8	-49,7	-41,4	-54,7	-68	-75,07	-82,57	-90,51	-100,10	-109,02	-116,92	-123,11	-127,31	-130,12	-132,98
Deferred taxes	-50,3	-54,6	-64,2	-63,1	-37,6	-47,7	-62,86	-69,14	-75,79	-83,82	-91,30	-97,91	-103,10	-106,62	-108,96	-111,36
Net Working Capital	**710,9**	**645,9**	**776,8**	**799,9**	**778,5**	**889,3**	**1009,22**	**1109,21**	**1215,45**	**1344,75**	**1465,76**	**1573,60**	**1656,98**	**1713,56**	**1751,26**	**1789,79**
Change in Net Working Capital		**-65**	**130,9**	**23,1**	**-21,4**	**110,8**	**119,9**	**100,0**	**106,2**	**129,3**	**121,0**	**107,8**	**83,4**	**56,6**	**37,7**	**2,8**
Net Change as % of Revenue			3,86%	0,64%	-0,52%	2,38%	2,3%	1,8%	1,7%	1,9%	1,6%	1,3%	1,0%	0,7%	0,4%	0,0%

Appendix 11: Change Net Working Capital

Dividends Historical						Dividends Forecast									
in € m	2014	2015	2016	2017	2018	2019E	2020E	2021E	2022E	2023E	2024E	2025E	2026E	2027E	TV
Dividends Paid	7.47	7.47	11.21	186.79	52.31	58.77	66.09	73.18	79.63	84.36	86.87	91.63	95.10	97.67	100.31
Earnings per share (€)	4.3	2.5	4.2	9.1	12.5	15.7	17.7	19.6	21.3	22.6	23.2	24.5	25.4	26.1	26.8
Earnings per share (€) - diluted	4.3	2.5	4.2	9.1	12.5	15.7	17.7	19.6	21.3	22.6	23.2	24.5	25.4	26.1	26.8
Weighted average shares outstanding	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
Weighted average shares outstanding, (	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
Dividend per Share	0.5	0.5	0.75	12.5	3.5	3.93	4.42	4.90	5.33	5.64	5.81	6.13	6.36	6.53	6.71
Payout ratio %	11.7%	20.1%	18.0%	137.6%	27.9%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%

Appendix 12: Dividend Forecast

CAPEX Historical						CAPEX Forecast									
CAPEX	2014	2015	2016	2017	2018	2019E	2020E	2021E	2022E	2023E	2024E	2025E	2026E	2027E	TV
Acquisition PP&E	58	62	69	92	106	135	103	110	136	142	145	143	138	134	137
% of Sales	*2.0%*	*1.8%*	*1.9%*	*2.2%*	*2.3%*	*2.6%*	*1.8%*	*1.8%*	*2.0%*	*1.9%*	*1.8%*	*1.7%*	*1.6%*	*1.5%*	*1.5%*
% of PP&E	*27.4%*	*27.9%*	*29.4%*	*36.5%*	*40.8%*	*45.7%*	*29.0%*	*29.1%*	*33.8%*	*31.8%*	*29.7%*	*27.4%*	*25.1%*	*23.6%*	*23.6%*
Acquisition of Intangibles	17	17	16	31	32	70	92	98	92	89	84	73	60	51	52
% of Sales	0.6%	0.5%	0.4%	0.7%	0.7%	1.4%	1.6%	1.6%	1.3%	1.2%	1.0%	0.9%	0.7%	0.6%	0.6%
% of Intangibles	15.6%	15.9%	17.0%	21.7%	25.7%	30.8%	20.9%	19.5%	21.3%	20.0%	18.7%	17.3%	15.8%	14.9%	14.9%
CAPEX	75	79	84	123	138	205	195	208	228	231	228	216	198	185	189
CAPEX as % of Sales	2.5%	2.3%	2.3%	3.0%	3.0%	4.0%	3.5%	3.4%	3.3%	3.1%	2.9%	2.6%	2.3%	2.1%	2.1%
CAPEX as % of PP&E + Intangibles	12.2%	12.5%	12.5%	18.3%	18.9%	24.2%	20.7%	19.9%	19.7%	18.4%	16.9%	15.2%	13.5%	12.3%	12.3%
PP&E+Intangibles	615	636	675	673	732	846	943	1044	1155	1258	1349	1421	1469	1501	1534

Appendix 13: CAPEX Forecast

D&A	D&A Historical					D&A Forecast									
	2014	2015	2016	2017	2018	2019E	2020E	2021E	2022E	2023E	2024E	2025E	2026E	2027E	TV
Amortization	18	12.8	11.3	14.3	17.2	16.5	18.9	21.5	23.8	25.9	27.8	29.2	30.2	30.9	31.6
%Intangibles	4.60%	3.17%	2.67%	3.46%	3.93%	3.36%	3.36%	3.36%	3.36%	3.36%	3.36%	3.36%	3.36%	3.36%	3.36%
%Sales	0.61%	0.38%	0.31%	0.35%	0.37%	0.32%	0.34%	0.35%	0.35%	0.35%	0.35%	0.35%	0.35%	0.35%	0.35%
Depreciation	39.8	44.7	48.6	56.1	65	74.4	79.3	84.7	93.6	102.0	109.4	115.2	119.1	121.7	124.4
% of PPE	17.77%	19.22%	19.28%	21.57%	22.06%	20.97%	20.97%	20.97%	20.97%	20.97%	20.97%	20.97%	20.97%	20.97%	20.97%
% of Sales	1.34%	1.32%	1.34%	1.36%	1.40%	1.45%	1.41%	1.37%	1.37%	1.37%	1.37%	1.37%	1.37%	1.37%	1.37%
D&A	50.5	57.5	59.9	70.4	81.5	90.9	98.3	106.2	117.4	127.9	137.1	144.4	149.3	152.6	156.0
% of Sales	1.70%	1.70%	1.65%	1.70%	1.75%	1.77%	1.74%	1.72%	1.72%	1.72%	1.72%	1.72%	1.72%	1.72%	1.72%
% of CAPEX	67.5%	72.6%	71.1%	57.2%	59.0%	44.3%	50.4%	51.1%	51.5%	55.4%	60.1%	66.9%	75.5%	82.5%	82.5%
CAPEX-to-D&A Ratio	1.48	1.38	1.41	1.75	1.70	2.25	1.98	1.96	1.94	1.81	1.66	1.50	1.32	1.21	1.21

Appendix 14: D&A Forecast

12 Publication bibliography

Allied Market Research (2018): Sports Equipment and Apparel Market by Product. Available online at https://www.alliedmarketresearch.com/sports-equipment-and-apparel-market, checked on 4/4/2019.

Aral, Sinan; Dellarocas, Chrysanthos; Godes, David (2013): Introduction to the Special Issue —Social Media and Business Transformation. A Framework for Research. In *Information Systems Research* 24 (1), pp. 3–13. DOI: 10.1287/isre.1120.0470.

Benninga, Simon Z.; Sarig, Oded H. (1997): Corporate finance. A valuation approach. International ed. New York, NY: McGraw-Hill (McGraw-Hill series in finance).

Blume, Marshall E. (1979): Betas and their Regression Tendencies. Some Further Evidence. In *The Journal of Finance* 34 (1), p. 265. DOI: 10.2307/2327161.

Bonini, Stefano; Zanetti, Laura; Bianchini, Roberto; Salvi, Antonio (2010): Target Price Accuracy in Equity Research. In *SSRN Journal. DOI:* 10.2139/ssrn.676327.

Booth, Laurence (2002): Finding value where none exists. Pitfalls in using adjusted present value. In *Journal of Applied Corporate Finance* 15 (1), pp. 95–104. DOI: 10.1111/j.1745-6622.2002.tb00344.x.

Burgstahler, David; Jiambalvo James; Noreen, Eric (1989): Changes in the probability of bankruptcy and equity value. In *Journal of Accounting and Economics* 11 (2-3), pp. 207–224. DOI: 10.1016/0165-4101(89)90006-2.

Cooper, Stephen; Sutherland, Gillian; Deng, Zhen, Suozzo Peter (2001): Valuation multiples: A primer. UBS Warburg. London, checked on 5/2/2019.

Copeland, Thomas E.; Weston, J. Fred (2000): Financial theory and corporate policy. 3. ed., reprinted with corr., [Nachdr.]. Reading, Mass.: Addison-Wesley.

Copeland, Thomas E.; Weston, J. Fred; Shastri, Kuldeep (2007): Financial theory and corporate policy. 4. ed., 5. [print.] (The Addison-Wesley series in finance).

Damodaran, Aswath (2006): Valuation Approaches and Metrics. A Survey of the Theory and Evidence. In *FNT in Finance* 1 (8), pp. 693–784. DOI: 10.1561/0500000013.

Damodaran, Aswath (2008): What is the Riskfree Rate? A Search for the Basic Building Block, 12/18/2008.

Damodaran, Aswath (2011): Damodaran on Valuation. Security Analysis for Investment and Corporate Finance. 2nd ed. New York: John Wiley & Sons (Wiley Finance).

Damodaran, Aswath (2012): Investment Valuation. Tools and techniques for determining the value of any asset. 3rd ed. Hoboken: John Wiley & Sons (Wiley finance series).

DeAngelo, Linda Elizabeth (1990): Equity Valuation and Corporate Control. In *The Accounting Review* 65 (1), pp. 93–112.

Demirakos, Efthimios G.; Strong, Norman C.; Walker, Martin (2004): What Valuation Models Do Analysts Use? In *Accounting Horizons* 18 (4), pp. 221–240. DOI: 10.2308/acch.2004.18.4.221.

Eberhart, Allan C. (2001): Comparable firms and the precision of equity valuations. In *Journal of Banking & Finance* 25 (7), pp. 1367–1400. DOI: 10.1016/S0378-4266(01)00171-6.

Euromonitor International (2018): World Market for Sportswear, checked on 4/15/2019.

FAMA, E. F./FRENCH, K. R. (1993): Common risk factors in the returns on stocks and bonds. In *Journal of Financial Economics* 33 (1), pp. 3–56.

Federal Reserve Bank of St. Louis (2019): Economic Research. Available online at https://fred.stlouisfed.org/, checked on 4/15/2019.

Fernandez, Pablo (2001): Valuation Using Multiples. How Do Analysts Reach Their Conclusions?, 7/17/2001.

Fernandez, Pablo (2006): A More Realistic Valuation. APV and WACC with Constant Book Leverage Ratio, 11/21/2006.

Fernández, Pablo (2002): Valuation methods and shareholder value creation. San Diego, Calif: Academic Press.

Frykman, David; Tolleryd, Jakob (2003): Corporate valuation. An easy guide to measuring value. London: Financial Times/Prentice Hall (Corporate finance).

Gordon, Myron J.; Shapiro, Eli (1956): Capital Equipment Analysis. The Required Rate of Profit. In *Management Science* 3 (1), pp. 102–110. DOI: 10.1287/mnsc.3.1.102.

Grand View Research (2018): Sports Equipment Market Analysis, checked on 3/27/2019.

IMF (2019): World Economic Outlook, April 2019, checked on 4/20/2019.

Jaime, Sabal (2008): WACC or APV? In *Journal of Business Valuation and Economic Loss Analysis* 2 (2), pp. 1–17.

Koller, Tim; Goedhart, Marc; Wessels, David (2005): The Right Role for Multiples in Valuation, 9/28/2005.

Koller, Tim; Goedhart, Marc; Wessels, David (2015): Valuation. Measuring and managing the value of companies. Sixth edition, University edition. Hoboken, NJ: Wiley.

KPMG (2018a): Equity Market Risk Premium – Research Summary - 31 Dec. 2018, checked on 4/15/2019.

KPMG (2018b): Cost of Capital Update. Available online at https://assets.kpmg/content/dam/kpmg/de/pdf/Themen/2018/2018_05_31_Cost_of_capital_EN.pdf, checked on 4/5/2019.

KPMG (2019): International Corporate Tax Table. Available online at https://home.kpmg/dk/en/home/insights/2016/11/tax-rates-online/corporate-tax-rates-table.html, checked on 4/15/2019.

Kumar, Rajesh (2016): Real options valuation. In Rajesh Kumar (Ed.): Valuation. Theories and concepts. Amsterdam: Academic Press, pp. 227–236.

Lintner, John (1965): SECURITY PRICES, RISK, AND MAXIMAL GAINS FROM DIVERSIFICATION*. In *The Journal of Finance* 20 (4), pp. 587–615. DOI: 10.1111/j.1540-6261.1965.tb02930.x.

Liu, Jing; Nissim, Doron; Thomas, Jacob (2002): Equity Valuation Using Multiples. In *Journal of Accounting Research* 40 (1), pp. 135–172. DOI: 10.1111/1475-679X.00042.

Luehrman, T. A. (1997): Using APV (adjusted present value). A better tool for valuing operations. In *Harv Bus Rev* 75 (3), 145-6, 148, 150-4.

Marketline (2019): Global Sports Equipment, checked on 3/25/2019.

Markowitz, Harry (1952): PORTFOLIO SELECTION*. In *The Journal of Finance* 7 (1), pp. 77–91. DOI: 10.1111/j.1540-6261.1952.tb01525.x.

Massari, Mario; Roncaglio, Francesco; Zanetti, Laura (2008): On the Equivalence between the APV and the "wacc" Approach in a Growing Leveraged Firm. In *European Financial Management* 14. DOI: 10.1111/j.1468-036X.2007.00392.x.

Matthews, Gilbert E. (2014): Capital Expenditures, Depreciation, and Amortization in the Gordon Growth Model. In *Business Valuation Review* 33 (4), pp. 113–123. DOI: 10.5791/0882-2875-33.4.113.

Mossin, Jan (1966): Equilibrium in a Capital Asset Market. In *Econometrica* 34 (4), p. 768. DOI: 10.2307/1910098.

Mukherjee, Tarun K.; Kiymaz, Halil; Baker, H. Kent (2005): Merger Motives and Target Valuation. A Survey of Evidence from Cfos, 2/22/2005.

Myers, Stewart C. (1974): INTERACTIONS OF CORPORATE FINANCING AND INVESTMENT DECISIONS-IMPLICATIONS FOR CAPITAL BUDGETING. In *The Journal of Finance* 29 (1), pp. 1–25. DOI: 10.1111/j.1540-6261.1974.tb00021.x.

OECD (2019): Economic Outlook and Interim Economic Outlook 2019, checked on 4/15/2019.

Paddock, James L.; Siegel, Daniel R.; Smith, James L. (1988): Option Valuation of Claims on Real Assets. The Case of Offshore Petroleum Leases. In *The Quarterly Journal of Economics* 103 (3), p. 479. DOI: 10.2307/1885541.

Pereiro, Luis E. (2002): Valuation of companies in emerging markets. A practical approach. New York: John Wiley & Sons (Wiley Finance, v.156).

Pinto, Jerald E. (2015): Equity asset valuation. Third edition. Hoboken, New Jersey: John Wiley & Sons (CFA Institute investment series).

Pinto, Jerald E.; Henry, Elaine; Robinson, Thomas R.; Stowe, John D.; Wilcox, Stephen E. (2015): Equity asset valuation. Third edition. Hoboken, New Jersey: Wiley (CFA Institute investment series).

PUMA SE (2018): Annual Report 2017, checked on 2/19/2019.

PUMA SE (2019a): Puma and first mile. Available online at https://about.puma.com/en/newsroom/corporate-news/2019/2019-03-28-puma-and-first-mile, checked on 4/14/2019.

PUMA SE (2019b): Annual Report 2018, checked on 2/19/2019.

PUMA SE (2019c): Sustainable Materials. Available online at https://about.puma.com/en/sustainability/product, updated on 4/14/2019.

PUMA SE (4/23/2019): PUMA AIMS FOR 90% SHARE OF MORE SUSTAINABLE MATERIALS BY 2020, checked on 4/29/2019.

Reilly, Frank K.; Brown, Keith C. (2011): Investment Analysis and Portfolio Management (with Thomson ONE - Business School Edition and Stock-Trak Coupon). 10th ed. Mason, OH: Cengage Learning US.

Research and Markets (2018): Sports Equipment and Apparel Market by Product, Sports, and Distribution Channel. Global Opportunity Analysis and Industry Forecast, 2017-2023, checked on 4/12/2019.

Reuters (2018a): Luxury group Kering to spin off Puma to its own shareholders. With assistance of Pamela Barbaglia Arno Schuetze. Reuters. Available online at https://www.reuters.com/article/us-kering-puma-de-spin-off-exclusive/luxury-group-kering-to-spin-off-puma-to-its-own-shareholders-idUSKBN1F0267, checked on 5/2/2019.

Reuters (2018b): Puma shares slump as luxury group Kering plans spin-off. With assistance of Emma Thomasson Sarah White. Available online at https://www.reuters.com/article/us-kering-puma-de-stocks/puma-shares-slump-as-luxury-group-kering-plans-spin-off-idUSKBN1F10QP, checked on 5/2/2019.

Rosenbaum, Joshua; Pearl, Joshua (2009): Investment banking. Valuation, leveraged buyouts, and mergers & acquisitions. Hoboken, NJ: Wiley (Wiley finance series).

Ross, Stephen A. (1977): The Capital Asset Pricing Model (CAPM), Short-Sale Restrictions and Related Issues. In *The Journal of Finance* 32 (1), p. 177. DOI: 10.2307/2326912.

Sharpe, William F. (1964): CAPITAL ASSET PRICES. A THEORY OF MARKET EQUILIBRIUM UNDER CONDITIONS OF RISK*. In *The Journal of Finance* 19 (3), pp. 425–442. DOI: 10.1111/j.1540-6261.1964.tb02865.x.

Statista (2017): Global Sports Apparel Market. Available online at https://www.statista.com/statistics/613169/size-of-the-global-sportswear-market/, checked on 4/4/2019.

The World Bank (2019): GDP Data. Available online at https://data.worldbank.org/indicator/ny.gdp.mktp.cd, checked on 4/15/2019.

Thomson Reuters Eikon (2019): Reuters Eikon Databank.

Trackalytics (2019): Trackalytics. Available online at https://www.trackalytics.com/, checked on 4/5/2019.

Williams, John Burr (1938): The theory of investment value. No. HG4521 W48., checked on 5/13/2019.