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Valuation Report on Bang & Olufsen

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Executive summary

Bang & Olufsen (also known as B&O) is one of the biggest icons of design and quality electronics in Denmark throughout the past century. However, the most recent years of its history have not been the smoothest and since the Financial Crisis in 2008 B&O has been struggling to get back on its feet.

In context of B&O's recent history, the main goal of this thesis has been to analyze B&O with the purpose of valuating the company and, thus, estimating a share price as of the 1st of November, 2016. The valuation has been based on both qualitative as well as quantitative analyses using a wide range of well-established tools for corporate analysis. The main chapters of the thesis cover the topics of company presentation, strategic analysis, financial statement analysis, the valuation itself, sensitivity analysis and recommendations for further work.

The strategic analysis covers two perspectives: an analysis of the external environment using the Nine Forces model (a combination of the PEST model and Porter's Five Forces) and an analysis of each of the product lines in B&O using the BCG Matrix. The strategic analysis finds many threats in the external environment but also concludes that the recent measures taken by former CEO Tue Mantoni has put B&O in a good position to tackle the main threats in the environment.

The financial statement analysis assesses the accounting quality and reorganizes in the income statement and balance sheet for the purpose of valuation. The analysis also examines the profitability of B&O using the DuPont model as well as the liquidity: B&O has been suffering with respect to both of these key concepts in recent years – e.g., the average profit margin of the last three financial years was -7.7%. Also, if B&O does not manage to make its free cash flow positive again, it will have a future liquidity problem.

Based on an intrinsic valuation using Economic Value Added model, this thesis finds that the appropriate value of B&O's stock is 83.22 DKK per share. The actual share price in the market on the 1st of November, 2016, was 74.5 DKK, which means that the suggested share price is approx. 11% higher than the market price. The EVA model was applied using a two-stage approach: a high-growth stage and a mature stage. The sensitivity analyses show that the estimated share price is rather sensitive to changes in the assumed stable growth rate (the rate by which B&O will grow in its mature stage) and the calculated WACCs of the high-growth period (9.63%) and the mature period (7.48%), respectively. However, despite the sensitivity to the underlying parameters, 83.22 DKK is believed to be the correct share price under the current circumstances.

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1 Introduction

In March 2016, I started as an analyst intern in the financial division of B&O PLAY in Kongens Lyngby and ever since the first week of my employment I have been fascinated by Bang & Olufsen as a company and deeply interested in the current state of affairs of the business. Over the course of my internship I have learned a lot about the company and grown an immense respect for its history, its products and its corporate culture. Though, while B&O has been a very interesting and inspiring place to work, it is fair to say that the last couple of years have not been the smoothest of B&O's history. News stories about a bleeding company that is losing hundreds of millions of DKK year after year and rumors and speculations about potential takeovers have filled the pages of business magazines and mainstream newspapers. Connected to these news stories, B&O's stock price has experienced significant rises as well as steep downfalls over the past few years, which give the impression of a company that may not necessarily have found its way yet – at least from an investor's perspective.

From producing annual sales in the order of more than 4 billion DKK just before the Financial Crisis took place in 2008 to losing a total of more than 265 million DKK over the past five financial years, B&O's financial performance has been subject to a rollercoaster ride and generated quite a lot of uncertainty about the company's future. At the end of the financial report for FY2006/7 on the 31st of May, 2007, B&O had 12,081,338 shares valued at 698 DKK each, resulting in market capitalization of approx. 8.4 billion DKK. By the end of the most recent annual report (for FY2015/16) on the 31st of May, 2016, B&O had 43,197,478 shares valued at 64 DKK each, resulting in a market cap. of approx. 2.8 billion DKK. That is equivalent to a decrease of 67% in less than a decade.

While the numbers related to the financial performance of B&O since the Financial Crisis do paint a dire picture, at a quick glance, it seems puzzling that one of the most respected companies of Danish corporate and cultural history has shaved off two thirds of its market value in less than a tenth of its lifetime. Given the rapid decline in recent years combined with the many news surrounding B&O and the recent appointment of a new CEO (Henrik Clausen) who is tasked with bringing B&O back to being the healthy company it once was, studying B&O from a valuation perspective is very exciting.

1.1 Problem statement

There are many approaches to valuating a company of B&O's nature. Given the fact there has been a lot of rumors regarding the potential takeover of B&O ever since Chairman Ole Andersen announced that the Board of Directors would be open to acquisition proposals in January 2015 (Reuters,

2015), applying an M&A perspective to the valuation of B&O might seem very reasonable. However, since the most probable opportunity to become acquired fell through back in April 2016 – when Sparkle Roll did not submit their tender offer before the deadline (Bloomberg, 2016) – it seems as if the leadership of B&O has renewed its focus on bringing back B&O to becoming a strong and profitable business (Bloomberg, 2016). I will therefore study B&O from a fundamental perspective and, thus, the problem statement of my thesis can be defined as:

- What is the value of Bang & Olufsen from an intrinsic perspective and how does it compare to the current market price of Bang & Olufsen's publicly traded stocks?

To help answer the main question the following supporting questions will be treated and answered throughout the main chapters of this thesis:

- Company presentation
    - What does B&O do and what products do they offer? What is its history and its values?
    - What strategies has the management led in recent years and what is the outlook?
    - What are the business units of B&O and how is the company/ownership structured?
- Strategic analysis
    - How and why can the overall strategic context of B&O affect its ability to perform?
    - How and why will the external environment affect B&O?
    - How do each of the business units of B&O stand in a competitive context and why?
- Financial statement analysis
    - How and why will the accounting quality of its financial reports affect the valuation?
    - How and why should the financial statements be reorganized to value the company?
    - How will the profitability and liquidity affect the valuation of B&O and why?
- Valuation
    - How will B&O be valuated and why has the selected valuation framework be chosen?
    - What are the inputs that affect the valuation of B&O and why do they have an impact?
    - What will the financial forecast look like in both the near and far future?
- Sensitivity analysis
    - How sensitive is the valuation to changes in WACC and the stable growth rate?

The structure of this thesis has been carefully designed so to answer these questions in a natural flow. After having treated the main areas of the thesis, some recommendations for further work will be suggested and, finally, a conclusion of the entire work will be drawn.

1.2 Methodology

To be able to answer the questions as completely and accurately as possible I will make use of a wide range of analytical models and frameworks, which have been established as good tools for the purpose of equity valuation in the field of finance. Below I provide an overview of the tools I have used:

- **Company presentation**

  To lay a solid foundation for the strategic and financial statement analysis as well as the valuation, B&O's history, its strategy, its business units, its distribution network, its recent sales figures, its management and its ownership/corporate structure will be presented. B&O's annual reports, information available on its website for investors and some mainstream news sources will be used as a foundation for this chapter.

- **Strategic analysis**

  The tools for the strategic analysis have been selected in order to depict the most accurate picture of B&O's current strategic situation. Initially, I will be the using the Nine Forces model, which is essentially a combination of the PEST model and Porter's Five Forces (Fleisher & Bensoussan, 2007, p. 92). Using this model, I will be able to analyze the external setting that will affect B&O. The PEST model covers the macroeconomic level while Porter's Five Forces deal with the industry. Combining these two levels of analyses will give me a strong foundation for the further analysis of B&O and its current situation. Moreover, to evaluate each business unit, I will make an analysis of each segment using the BCG Matrix. This will give me good understanding of the competitive situation of each of the units and allow me to better understand B&O's overall position in the marketplace as well as its future growth potential (Henderson, 1970). Finally, I will summarize my strategic analysis using a SWOT model, which will give an overview of the strengths, weaknesses, opportunities and threats that are relevant for B&O. The analyses made with the Nine Forces and the BCG Matrix will serve as inputs to the SWOT analysis.

- **Financial statement analysis**

  To make an accurate analysis of the financial statement I will rely heavily on the suggestions made by Petersen and Plenborg in their book "Financial Statement Analysis" (Petersen &

Plenborg, 2012). The main tool that I will use with respect to profitability will be the DuPont model. Moreover, I will conduct a liquidity analysis using the ratios and guidelines suggested by Petersen and Plenborg in chapter 7 of their book. In addition, using their chapters 4 and 13, I will assess the accounting quality of B&O as well as analyze and reorganize the financial income statement and balance sheet.

- **Valuation**

  In the chapter of valuation, I will base my analyses on the suggestions of Aswath Damodaran in his book "Investment Valuation" (Damodaran, 2002) as well as Petersen and Plenborg's templates for setting up pro-forma income statements and balance sheets. To calculate the value of B&O based on the forecasts I will be using the Economic Value Added (EVA) model, which is a valuation intrinsic approach in the family of excess return models. In the beginning of the chapter, I will start out by laying out the different valuation models that are available and explain in further detail why I have chosen the EVA model.

- **Sensitivity analysis**

  In the chapter concerning the sensitivity analysis I will be analyzing the valuation's sensitivity to the two most important inputs to the model: the weighted average cost of capital (WACC) and the stable rate of growth in the mature period. As I will explain in the chapter, the WACC and the stable growth rate are arguably the two most uncertain components of the model, which is why I will be make an analysis based on these two parameters.

In each of the chapters, I will further present and analyze alternatives to the models I have decided to use in my analyses. I will present pros and cons of the different tools and justify the choices I made.

1.3 Limitations

As my purpose is to make a valuation of B&O using the Economic Value Added model, I will not consider the value of B&O under M&A scenarios where potential synergies from takeovers and take-over premiums could have an effect. My analysis and valuation are based entirely on an intrinsic-value approach and I will completely disregard other valuation approaches and the M&A opportunities with the exception of the recommendations for the further work discussed in Chapter 7.

During the strategic analysis, I will be making assessments of B&O's current external environment. A significant factor in this regard is the outcome of the U.S. presidential election held on the 8th of November, 2016. As the majority of the work on this thesis had been done before this date, I have not taken the consequences of the actual winner into account. Rather, I will be making assumptions

of what would be likely to happen if one or the other candidate were to win. Thus, I urge the reader not to have the actual winner of the election in mind when reading.

Moreover, on the 14th of November, 2016, Samsung announced that it had acquired HARMAN, one of B&O's strategic partners (Samsung, 2016). I will disregard this acquisition, as the announcement was made after I had written my thesis. Hence, my cut-off date will be the 1st of November, 2016.

1.4 Sources

To achieve the objective of my thesis, I will be using a wide collection of sources to support my statements and guide my analyses in the right direction of a correct and fair valuation of B&O. I will be using the works of Petersen & Plenborg and Aswath Damodaran to lay out the foundation for my analyses. Regarding the data required in my analyses, I have collected data solely from publicly available, secondary data sources. These sources include B&O's annual reports, information available on B&O's website for investors, company announcements, published research papers as well as news from credible business magazines, newspapers and other trustworthy news sources.

Moreover, I am making heavy using of industry and market reports from widely recognized sources such as Euromonitor, IHS Markit, Statista, Ipsos and more. These sources especially support my arguments during the strategic analysis of B&O. To a lesser extent, I have used online encyclopedias to support factual and historical statements. I have treated and validated each source thoroughly and critically to ensure that the statements I will make in this thesis are valid and factually correct. This, too, includes the statements and announcements made by leaders of B&O, as they naturally may be overly optimistic or subjective.

2 Company presentation

Bang & Olufsen (also known as B&O) was founded in 1925, by two young Danish engineers, Peter Bang and Svend Olufsen (Bang & Olufsen, 2012, p. 5). Since its foundation, B&O has been producing state-of-the-art products in the space of consumer electronics, which have shaped popular culture year after year. B&O is notorious for its innovative design, quality of sound, durability and superior craftsmanship. B&O designs and manufactures audio and video products, which include headphones, sound systems, televisions and home control systems.

2.1 History

At an early age, both founders showed a great interest in radio electronics and graduated as electrical engineers at the Technical University of Aarhus. After graduating in 1924, Bang and Olufsen started

to build a mains receiver, a radio that did not require accumulators nor the batteries to recharge it (Funding Universe, 2001). A year later, Bang and Olufsen founded B&O. The company's headquarters were established in Struer (Olufsen's hometown), located in the northwestern part of Denmark. The first product that B&O launched was the B&O Eliminator, which was the first radio to use alternate current instead to the direct current and batteries, which was the norm at that time. Two years after the lunch of the B&O Eliminator, B&O developed the Five Lamper – a radio that was directly connected to the mains. The radio was not only a technological revolution but also had an innovative design due to its walnut cabinet, which was uncommon for the time. Thanks to the Five Lamper, B&O secured its place in the Danish market (Funding Universe, 2001).

In 1960, the European Free Trade Association (EFTA) was created and tariffs, duties and customs were relaxed all around Europe. Denmark was accepted to be part of the EFTA, which exposed B&O to the highly competitive European market and forced B&O to focus its efforts. Doing so, B&O decided to work mainly with the high-end market (Funding Universe, 2001).

The 1970s were good years for the company and B&O decentralized its operations and opened subsidiaries in Scandinavia, Western Europe and the U.S. (Aarhus University, 2015). However, in the 1980s, the company started to struggle with the Asian competitors that enjoyed a lower labor cost and a shorter product development cycle. The decentralization strategy turned out to not be a good idea after all: The subsidiaries turned into separate entities, which led to overspending, unnecessary bureaucracy and high costs (Funding Universe, 2001).

By 1990, B&O almost went into bankruptcy. In 1991, a new CEO was appointed: Anders Knutsen. Knutsen implemented a new strategy named "Break Point 1993". The strategy plan involved centralizing the company once again, reducing costs, including non-core activities and changing the manufacturing process and distribution channels. Employees and managers were laid off, the subsidiaries' influence was reduced, production was changed from *mass* to *lean* and the main distribution channel was changed from third-party retailers to B1 stores (B&O's franchise stores) and shop-in-shop stores. The strategy proved to be quite successful and already by 1993 the company was earning profits again (Funding Universe, 2001).

Despite the company's improvement during the 1990s, the company's profit started to decline in the new millennium. B&O started to focus too much on design and left technology as a second priority. In order to rehabilitate sales and brand image, a new CEO in 2001 was appointed: Torben Ballegaard

Sørensen. Sørensen laid off staff, closed underperforming B&O stores and expanded the product portfolio (Encyclopedia, 2007).

In 2005 B&O started to grow aggressively: Besides opening a lot of new B1 stores, the company started to sell custom home theater systems and multi-room audio system, install systems in luxury hotels and pursue partnerships with yacht manufacturers, real estate developers and lease jets companies. B&O's growth strategy culminated with the launch of the Automotive business, which offered car audio systems with unprecedented sound quality (Encyclopedia, 2007).

The company continued to grow until 2007 when the Financial Crisis occurred (Wikipedia, 2016). B&O's urge for a new strategy was critical and therefore, in April 2008, a new CEO was appointed, Karl Hvidt, who developed the "Pole Position Strategy 2008". By 2010, the results improved with a positive net income of 28 mDKK. Though, it did not prevent Hvidt from being fired and replaced by Tue Mantoni in March 2011 who implemented a 5-year strategy called "Leaner, Faster, Stronger". Tue Mantoni stayed in B&O until July 2016 when Henrik Clausen took over (Bang & Olufsen, 2016).

2.2 Company strategy

Mantoni's "Leaner, Faster, Stronger" strategy, a five-year strategy plan, was divided in two phases: The first phase concerned the financial years from 2011/12 to 2013/14 (both years including) while the second phase concerned the two financial years from 2014/15 to 2015/16. The long-term financial target was set to achieve annual revenues of around 8-10 billion DKK and an EBIT margin higher than 12% (Bang & Olufsen, 2012, p. 33).

2.2.1 First phase of "Leaner, Faster, Stronger"

The first phase focused on creating a strong foundation for growth by increasing innovation, optimizing retail network and by creating a leaner and more responsive supply chain. Product launches increased significantly across all product categories, thanks to the decision to establish a new R&D department in Singapore and the launch of a new brand, B&O PLAY (Bang & Olufsen, 2012, p. 11). B&O PLAY was introduced to reach a wider and younger audience by expanding the product portfolio to headphones and portable audio products. B&O developed more online sales and third-party retailers for B&O PLAY. Low-performing stores in mature markets were closed and new stores were opened in emerging markets, such as China, India and Japan, which expanded B&O's global presence. In order to increase B&O's influence in the Chinese market, the company made a distribution deal with Sparkle Roll and A Capital (Bang & Olufsen, 2012, p. 14).

2.2.2 Second phase of "Leaner, Faster, Stronger"

In FY2014/15 the net income before discontinued operations remained negative (-607 mDKK). This was partly due to unexpected issues with TV sales, which affected profitability and net working capital of the whole company (Bang & Olufsen, 2015, p. 4). Because of this, the Board of Directors decided in December 2014 to divest the B2B businesses (Automotive and ICEpower) by selling the divisions (Bang & Olufsen, 2016). In FY2015/16, the net income remained negative with a value of -208 mDKK. In these financial years, B&O announced a strategic partnership with LG and HP, which I will describe and analyze in further detail later (in Section 2.3.3 and Chapter 3).

2.2.3 Strategy outlook

In the years to come, special focus will be put on increasing the agility and flexibility in product development for the Bang & Olufsen segment. B&O PLAY will continue to issue new product launches and focus in brand awareness by expanding its third-party retail distribution network globally (with the U.S. being the principal target). It is expected that B&O PLAY will be the main growth driver with a double-digit growth rate (Bang & Olufsen, 2016, pp. 32-33). Furthermore, in order to enhance B&O's high-end position, B&O will continue to improve customer retail experiences through the "Sensory Store" concept (Bang & Olufsen, 2016, p. 31)

B&O will continue to focus on becoming a leaner and more agile company by increasing the technology and sourcing partnerships, a stronger product life cycle management and an optimized logistics network. In addition, B&O will emphasize its efforts on creating innovate products and simplifying service offerings to match current and future dealer and consumer demands (Bang & Olufsen, 2016, p. 32).

2.3 Business units

B&O has two business units: Bang & Olufsen and B&O PLAY, supported by strategic partnerships.

2.3.1 Traditional Bang & Olufsen products

The Bang & Olufsen business unit delivers high-end sound and picture experiences and it is the backbone of the company, on which the rest of the business has been built (Bang & Olufsen, 2015, p. 4). This business unit targets middle and upper class individuals who value innovative design and great sound quality. Bang & Olufsen product range consists of three product lines: *Beovision* (televisions), *Beosound* (sound systems) and *Beolab* (speakers). For more information on the products offered in the Bang & Olufsen business unit, see Appendix 1: B&O PLAY and Bang & Olufsen products.

2.3.2 B&O PLAY

B&O PLAY is a startup division with a 91-year heritage driven by a focus to bring B&O's core focus for a younger audience. The B&O PLAY product range consists of headphones, earphones, Bluetooth speakers, network speakers and loudspeakers. For more details on B&O PLAY's products, please refer to Appendix 1: B&O PLAY and Bang & Olufsen products.

2.3.3 Strategic partnerships

By entering in strategic partnerships regarding technology development and distribution, B&O has been able to increase brand awareness and take advantage of the partners' economies of scale and technology. B&O has three partnerships (with LG, HARMAN and HP, respectively) and each of these partnerships will be presented in the following subsections.

LG: In March 2016, B&O announced a strategic technology partnership with LG regarding the development and production of TV sets. Through the partnership deal with LG, B&O will be able to focus on core competences within acoustics, design and home integration within the development of TVs and combine them with LG's OLED technology and leverage the economies of scale in production. The first TV set as a result of the partnership with LG is expected to be launched in 2017 (Bang & Olufsen, 2016).

HARMAN: In May 2015, B&O sold its Automotive business to HARMAN and entered into a brand licensing agreement. HARMAN is a worldwide distributor of audio systems and has a large presence in the industry for branded car audio solutions. The partnership gives B&O the opportunity to accelerate the brand presence in the automotive industry through the scale, technology and global marketing of HARMAN while also reducing the risk of B&O's business model. As a consequence of the divesture of the Automotive business unit, B&O received 1,130 mDKK in cash and is entitled to future license payments for the next 20 years starting from 2017/18, which includes a min. annual payment of 12.7 mDKK and a per-unit license fee. During the 20-year period, B&O is expecting to net 3 billion DKK (Bang & Olufsen, 2015, p. 3).

HP: As a consequence of Apple's acquisition of Beats in 2014, HP had to look for a new audio partner. In 2015, B&O took the opportunity to partner with HP and offer its expertise within acoustics. B&O would custom-tune each notebook, desktop, tablet and accessory for precise sound. This deal was presented as a great way to increase brand awareness between PC and tablet costumers who are not necessarily in B&O's traditional target group and who tend to rely on their devices' native audio capabilities when listening to music and watching movies online (CNET, 2015).

2.4 Distribution

B&O products are mainly sold in an extensive network consisting of 485 of B&O (B1) stores and 172 shop-in-shops (SIS) across more than 70 countries. Most of B1 stores are owned by independent retailers, although B&O itself is also the owner of a few shops.

B&O PLAY products are also distributed through third-party retailers and on B&O PLAY's website. By using alternative channels, B&O PLAY gains a higher exposure to the target segment than it would through the regular B1 shops. Also, it is a way to make a distinction between both consumer brands and reduce the effect of cannibalizing sales. In line with the company's strategy "Leaner, Stronger and Faster", the number of third-party retailers has increased rapidly during the last five years (in just the past year, the number of third-party retailers went from 3,308 to 5,692) and the number of B1 and SIS stores has decreased (from 918 in FY2011/12 to 657 in FY2015/16). For an overview, see Appendix 2: B1&SIS and third-party retailer stores.

2.5 Sales revenue by product and region

Sales mDKK	FY 2015/14	FY 2014/13	FY 2013/12	FY 2012/11
B&O PLAY	970.2	613.5	534.7	532
Speakers	500.3	424.2	433.6	392.6
TV	846.8	1,083.2	874.5	885.4
Audio	105.3	117.8	173.4	218.1
Other	210.7	117.8	151.7	152.7
Auto./ICEpower	-	-	-	632.8
Total	2633.3	2356.5	2167.9	2813.5

Table 2.1 Sales revenue by product line, based on annual report FY 2015/16, page 11, FY 2013/14, page 13 and FY 2012/13, page 64

B&O PLAY's growth in revenue has been impressive through the last four years, it has gone from 532 mDKK in FY2012/13 to 970 mDKK in FY2015/16, representing a 37% of the total revenue stream for the year. On the other side, TV sales have dropped slightly from 885.4 mDKK in FY2012/13 to 846.8 mDKK in FY2015/16. TV sets used to be B&O's main sales revenue driver but it has not grown over the last five years. The LG partnership is expected to drive sales up significantly, though. Rather than reporting TV sales in the B&O PLAY unit under the Television product line, the B&O PLAY TV model (i.e., Beoplay V1) was reported together with the rest of the B&O PLAY products under the same line item. This distorts the picture of the sales growth a little and, when examining the sales development of B&O PLAY and TVs, one has to take this into consideration.

Despite B&O's efforts to open new markets, in FY2015/16, B&O's principle market was still Europe, representing 63% of the total revenues, followed by the BRIC region (18%), the *Rest of the World* (11%) (the area outside of Europe, BRIC and North America) and the North American region (8%).

2.6 Management

The company's governing bodies are the Board of Directors and the Executive Board. The Board of Directors has the responsibility to supervise the Executive Board and the overall strategic management while the Executive Board is responsible for the day-to-day management. The Executive Board has to follow the recommendations of the Board of Directors and is also responsible for submitting proposals and recommendations regarding strategy and objectives to the Board of Directors (Bang & Olufsen, 2016, p. 2). The Executive Board is formed by the CEO, CFO and COO while the Board of Directors is usually composed of nine members grouped in three independent committees (remuneration, nomination and audit) and headed by the chairman (Bang & Olufsen, 2016, p. 2).

In September 2016, B&O announced a proposal to elect one additional member to the Board of Directors: Ivan Tong, the current CEO of Sparkle Roll. Also, the board proposed to reelect all existing members of the Board of Directors and elect Juha Christensen as a new member (Bang & Olufsen, 2016). Though, the roles of Ivan Tong and Juha Christensen have not been specified yet. For further details about the board members and their roles, please refer to Appendix 3: Management.

2.7 Ownership structure

B&O's shares are listed on NASDAQ OMX Copenhagen and have a current market capitalization of approximately 2,765 mDKK by the time of the end of the most recent annual report (May 31st, 2016). The company has only one type of shares and each share equals one voting right and has a nominal value of 10 DKK. In total, B&O has 43,197,478 shares of which 32,085,588 are floating (representing a 74.3% of the share capital) and the company owns 29,999 shares (4-traders, 2016). As of October 2016, the major shareholder is Sparkle Roll with a share of 20.65% of the total voting rights. For further information about B&O's shareholders please refer to Appendix 4: Shareholders.

2.8 Corporate structure

Bang & Olufsen a/s is the parent company of the B&O group and includes different subsidiaries, which are located all around the world. The parent company owns 100% of all the subsidiaries. Due to legal reasons, the group has several selling entities spread around the world (Europe, Middle East, North America and Asia). The group also has a subsidiary for B&O PLAY (B&O PLAY a/s), the Czech factory (Bang & Olufsen s.r.o), the R&D department (Bang & Olufsen Asia Pte Ltd) and the

operations (Bang & Olufsen Operations a/s). Finally, B&O also used to have an associate, John Bjerrum, dedicated to the field of industrial wet paint and surface treatment of plastic, wood and metal as well as tampon print. It was liquated during FY2015/16, though.

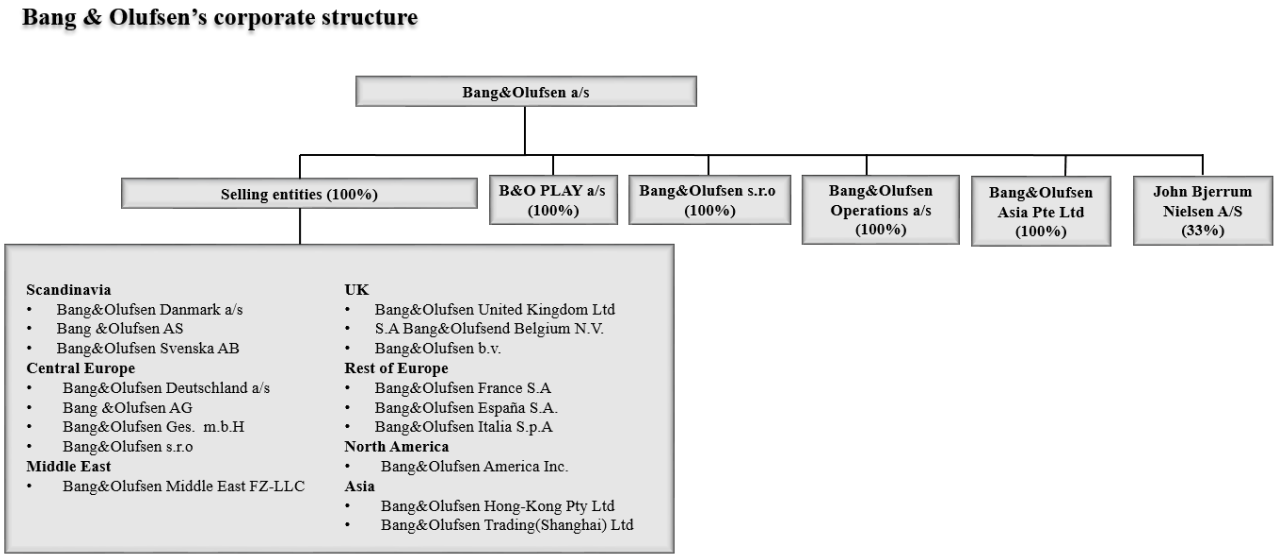


Figure 2.1 B&O's corporate structure (Bang & Olufsen, 2016, p. 107)

3 Strategic analysis

In this chapter, I will make an analysis of the strategic situation that B&O is involved with. Two levels of the environment will be studied: (1) the general environment and (2) the industry – both using the "Nine Forces" model. The general environment refers to the environment, which is broad in scope – i.e., it is not controllable and has long-term implications for managers, firms and strategies (Fleisher & Bensoussan, 2007, p. 88). The industry environment involves the environment with components that normally have relatively specific and immediate implications for the firm (Fleisher & Bensoussan, 2007, p. 90). Furthermore, in order to get a deeper understanding of the strategic position of B&O's business units, I have conducted an analysis using the BCG Matrix. I decided not to analyze the internal environment (e.g., using the Porter's value chain model), as the main problems in relation to B&O's internal activities are related to the production of TV sets (The Local, 2016). These problems are going to cease after the strategic deal with LG is fully implemented. I will finish the chapter by summarizing the most relevant findings by using the SWOT model.

3.1 The Nine Forces

The "Nine Forces" technique combines a macro environmental analysis (using the PEST model) with an industry analysis (using Porter's Five Forces) and provides a holistic perspective on a firm's competitiveness. By combining these two models, one is able to identify and analyze the relevant forces that will affect an industry's profit potential (Fleisher & Bensoussan, 2007, p. 92). Under this technique, the following questions can be answered:

- How attractive is the industry?
- How can a firm best compete in the industry?

In order to assess the relative strength of each of the Nine Forces, a rank will be applied to each force on a scale going from 1 to 10 with 10 being the strongest and 1 being the weakest. I will assign a rank to each of the forces with respect to B&O. These ranks will help provide an overview of forces' impact and help draw an overall conclusion of B&O's external environment.

3.1.1 PEST

The PEST model is a way to address and study the broader issues that affect the general environment in which a firm operates (Fleisher & Bensoussan, 2007, p. 88). The acronym PEST stands for **P**olitical/legal, **E**conomic, **S**ocial and **T**echnological sectors. The macro-environment is formed by an immense number of different factors but I will solely focus the key aspects that are relevant to B&O.

3.1.1.1 *Political/legal – Rank 7*

The political and legal components are related to government and public attitudes toward the company's industry, lobbying efforts by interest groups and the industry's regulatory climate (Fleisher & Bensoussan, 2007, p. 89). The current negotiations over the Transatlantic Trade and Investment Partnership (TTIP) trade agreement is something that needs to be taken into consideration. This agreement concerns the EU and the U.S. and mainly focuses in removing the non-tariff-measures such as customs procedures, labelling requirements and technical barriers to trade (different regulations, certifications and standards) (European Parlament, 2015, pp. 10-11).

The treaty has been criticized intensively by the general media (BBC, 2016). Whether the effect for Europe will be positive or negative is still uncertain. According to the World Trade Institute, EU's GDP will increase 0.5% in per year (World Trade Institute, 2016, p. 23). However, a study by the Global Development and Environment Institute indicated that the European economy will experience losses in terms of net exports, net losses in terms of GDP, loss of labor income, job losses,

reduction of the labor share, loss of government revenue and higher financial instability in Europe (Capaldo, 2014, p. 2). Thus, the overall effect of the treaty on B&O is ambiguous. It holds true that the treaty will facilitate further B&O's entrance on the U.S., which is a top priority. However, this treaty could create a more intense competitive landscape for B&O. Overall, I evaluate the threat of politic/legal to be medium-high (rank 7).

3.1.1.2 *Economic – Rank 8*

The industry's consumption behavior is largely influenced by economic trends such as employment rates, exchange rates, interest rates, inflation rates, credit availability and fiscal and monetary policies between others (Fleisher & Bensoussan, 2007, p. 90). In this section, I will study the economic situation in the regions in which B&O has the biggest presence (Europe, BRIC and North America).

3.1.1.2.1 U.S.

United States	2010	2011	2012	2013	2014	2015	2016	2017[1]
GDP (growth %)	2.53	1.60	2.22	1.49	2.43	2.43	2.2	2.5

Table 3.1 U.S GDP growth 2010-2017 based on the World Bank data (World Bank, 2016)

The U.S. economy has slowed down in recent quarters: Consumption, residential investment and government spending have made positive contributions to growth while business investment has contracted sharply (Euromonitor, 2016, p. 9). There is a potential risk that the U.S. might fall into a prolonged stagnation. The slowdown in the U.S. economy in the first half of the year, lower labour productivity growth and the sharp decline in business investment indicate that there is a risk for this scenario to occur (Euromonitor, 2016, p. 10).

The new American President can have a big effect on U.S economy, too. The Democratic candidate, Hilary Clinton, is associated with broad continuation of current economic policies. In contrast, Donald Trump's economic proposals combine unsustainably high tax cuts,with protectionist and anti-immigrant policies that would raise costs for U.S. businesses and consumers alike (Nunns, et al., 2015). According to a study made by Euromonitor, the U.S. GDP growth rate would only reach 0.4% in 2017 and 0.8% in 2018 if Trump wins (Euromonitor, 2016, p. 10).

3.1.1.2.2 Europe

Euro Area	2010	2011	2012	2013	2014	2015	2016	2017[1]
GDP growth	2.07%	1.59%	-0.88%	-0.32%	0.90%	1.66%	1.6%	1.4%

Table 3.2 Euro Area GDP growth 2010-2017 based on the World Bank data (World Bank, 2016)

[1] The forecasts for 2016 and 2017 for the U.S, Europe and BRIC is based on the IMF World Economic Outlook Update of the 1st of July 2016 (International Monetary Fund, 2016).

Eurozone stock markets have rebounded from some of the shocks earlier in 2016 but remain significantly below the level from one year ago. After the *Leave* victory in the *Brexit* referendum, European stock prices dropped sharply and the British pound reached its lowest level since 1985 (Bloomberg, 2016). Eurozone banks have been squeezed by the difficulty of passing negative interest rates onto their retail depositors (Euromonitor, 2016, p. 19). Furthermore, yields on safe assets have declined further, reflecting both higher global risk aversion and expectations of easier monetary policy going forward – particularly in the advanced economies (International Monetary Fund, 2016, p. 2). If the slow productivity and employment growth continues of the most recent years, there is a risk that Europe will fall into stagnation (Euromonitor, 2016, p. 16).

3.1.1.2.3 BRIC

The BRIC countries are suffering from a political and economic crisis. Besides the fact that interest rates have increased considerably in this area, the systematic fall of commodity prices has negatively affected the majority of BRIC countries, which rely heavily on commodity exports. Table 3.3 shows their recent GDP growth rates.

GDP growth (%)	2010	2011	2012	2013	2014	2015	2016	2017[1]
Brazil	7.53	3.91	1.92	3.02	0.10	-3.85	-3.3	0.5
Russia	4.50	4.26	3.52	1.28	0.71	-3.73	-1.2	1
India	10.26	6.64	5.62	6.64	7.24	7.57	7.4	7.4
China	10.63	9.48	7.75	7.68	7.27	6.90	6.6	6.2

Table 3.3 BRIC GDP growth, own creation based on World Bank data (World Bank, 2016)

3.1.1.2.3.1 Brazil

Brazil has been under a political crisis, which reached its peak with the destitution of the former president Dilma Rousseff. Her destitution resulted in higher optimism among investors in the market with corporate confidence showing a solid improvement in middle of 2016 (Euromonitor, 2016, p. 40). Although, economic conditions remain poor, there are signs of that the economy is recovering (Bloomberg, 2016). The stock market index (BOVESPA) has been rising due to a higher confidence from investors (in the last year it increased 30.11%[2]) and the industrial production index seems to be improving from its lows (Euromonitor, 2016, p. 38).

3.1.1.2.3.2 Russia

After Russia decided to intervene in Ukraine using military force, numerous countries imposed sanctions on Russia. These sanctions, combined with a systematic decrease of the oil prices of nearly more

[2] According to Bloomberg. See online: http://www.bloomberg.com/quote/IBOV:IND

than 50% in the last two years, have caused Russia to fall into recession. Taking the moderate recovery of oil prices and the improvement of the index of industrial production the IMF forecasted a milder GDP decline for 2016 (-1.2%) and a positive GDP growth rate of 1% in 2017. A stronger Russia is of course in the interest of B&O.

3.1.1.2.3.3 China

Even though China's GDP growth rate is significantly higher than the world average with a value of 6.90%, its GDP growth has slowed to levels not seen in a quarter-century (Marketwatch, 2016). Currently, China's debt level is around 250 of the GDP (The Guardian, 2016). Despite the continuing fast credit expansion, borrowing costs for the private sector have increased by around 2.5 percentage points year-on-year (Euromonitor, 2016, p. 33). With a debt to GDP ratio of 250-300% and the need for difficult reforms, China is still quite vulnerable to a hard landing (Euromonitor, 2016, p. 31).

3.1.1.2.3.4 India

India is the only BRIC country that has benefitted from the decrease in the commodities prices, as it is a net importer (Investopedia, 2015). In the first quarter of 2016, growth continued to be driven by real domestic consumption, which is expected to be further supported by income boosts. Yet all other expenditure components of GDP continue to perform weakly with both investment and net exports adding virtually zero to GDP growth in the first quarter of 2016 (Euromonitor, 2016, p. 42). The slowdown in investment can affect the economic and productivity growth if the government does not take any actions to boost investment.

3.1.1.2.4 Summary of the Economic impact

While the outlook of the analyzed economies does not look too certain, all of the economies are projected to grow at positive rates in 2017 by the IMF. There is no doubt that the impact of the economies on the success of B&O is very high and, therefore, I have assigned a rank of 8. However, while there are uncertainties in the different economies, there is no sign of immediate crisis to occur in the near future – on the contrary, the BRIC countries seem to be improving (with the exception of China). I therefore assume that the economies will not change drastically in the foreseeable future.

3.1.1.3 *Social – Rank 4*

The social component is related to characteristics of the social context and includes demographics, cultural attitudes, literacy rates, education levels, customs, beliefs, values lifestyles, social trends, age distribution, geographic distribution and population mobility (Fleisher & Bensoussan, 2007, p. 90). I will focus on demography and social trends and analyze these two elements in the following sections.

3.1.1.3.1 Demography

Nowadays, aging, migration, urbanization and the increase of unmarried (single) persons are the most significant demographic trends of our times (Euromonitor, 2016, p. 23). The mid-lifer population – people between 45 and 59 years of age – has increased 12% since 2010 and now represents 1.2 billion people worldwide. Mid-lifers in general have an income well above average – thus, representing a large, affluent and growing market (Euromonitor, 2016, p. 6).

3.1.1.3.2 Social trends

Customers are moving away from obtaining more "stuff" to the gathering of experiences (Euromonitor, 2016, p. 1), which could potentially benefit B&O, as it sells "high quality experiences". Moreover, there is a new consumer segment emerging: the "agnostic consumers". These consumers are hyper-informed with multiple opportunities to compare prices at their disposal and they are less bothered about labels (Euromonitor, 2016, pp. 2-3). The emergence of this consumer group is not necessarily good news for B&O, as it indicates that an increasing proportion of the population might not be as brand-loyal as B&O would like. Overall, I evaluate the threat of social trends and demography to be low (rank 4).

3.1.1.4 *Technological – Rank 10*

The technological component is compounded by the impact of science and technology in product and process innovation and the effects of technological change on the industry's competitive strategy (Fleisher & Bensoussan, 2007, p. 90). The 21st century technology landscape is known for its fast development cycles led by the digital revolution. The consumer electronics industry is experiencing one of the fastest technology advancements – the most notable in the consumer space being the rise of laptops, LED & OLED televisions, smartphones, wireless speakers and headphones.

B&O's biggest challenge in this regard is the technological progress: The life of consumer electronics is becoming shorter and it is getting more difficult for companies to convince customers to buy expensive electronics, which quickly become obsolete (Ingeniøren, 2010). Furthermore, B&O has lost a lot of its core customers by being technologically behind: Asian companies are nowadays the leaders in the development and sales of consumer electronics (MBASkool.com, 2016). Overall, I evaluate the threat of technology to be very high (rank 10).

3.1.2 Porter's Five Forces model

Porter identified Five Forces that determine the intrinsic long-run attractiveness of an industry: competitors, potential entrants, substitutes, buyers and suppliers (Kotler & Keller, 2012, p. 232).

3.1.2.1 *Threat of intense segment rivalry – Rank 10*

This force analyzes the intensity of competition within an industry and has been empirically proven in many occasions to be the most influential of the five forces (Fleisher & Bensoussan, 2007, p. 93). In order to analyze this force, I will first use the Porter's generic strategy model to analyze the different strategic positions that companies, including B&O, have within the industry. After that, I will study the competitive landscape.

3.1.2.1.1 Porter's generic strategies

Under this model, companies are categorized into four groups depending on their strategy: cost leadership, differentiation, cost focus and focused differentiation. In the cost leadership strategy grouping, the company aims to be the lowest cost producer by emphasizing in efficiency and economies of scale and by providing the products to a broad customer base. The differentiation strategy also targets a broad market but focuses on the creation of unique products allowing the companies following the differentiation strategy to charge a price premium.

Under the focus strategy grouping, the company emphasizes on a niche market segment and the firm gains competitive advantage through product innovation and/or brand marketing rather than efficiency (Wikipedia, 2016). Under this strategy, the company enjoys high customer loyalty, discouraging other firms to compete directly. The price premium that the company can charge is even higher than in the differentiation strategy, as there are no close substitutes. The focus strategy has two variants: (1) the cost focus where the company seeks to be the leader in terms of costs in the niche market and (2) the differentiation focus where the company seeks to achieve even a higher differentiation.

Figure 3.1 includes the most relevant competitors for B&O, which I have generated based on research on each of the competitors' websites and by examining publicly available reviews of their products online. The competitors differ on product lines, quality, prices and distribution strategies. Some of the companies (like LG and Samsung) do offer high-end product lines but the classification has been done considering the general offering of products.

Figure 3.1 Porter's generic strategies, own creation

3.1.2.1.2 Competitive landscape

B&O has been following a differentiation focus strategy for the most recent decades. By offering high-quality products, the company has been able to differentiate itself and sell products with high price premiums. Though, these days B&O is finding it difficult to keep up with the industry trends.

The consumer electronics industry is made up of big players – most of them coming from Asia, such as Samsung, Sony, and LG. Fortunately for B&O, none of the big players have yet achieved the brand value, quality, design and status that B&O possesses. Rather, the most relevant competitor for B&O at the moment is the BOSE, a privately held company. Forbes estimated that, in 2015, BOSE had annual sales of $3.5 billion USD. BOSE is known for its noise cancelling headphones but also produces home audio systems and speakers, professional audio systems and automobile sound systems. Even though BOSE does not offer the same level of design as B&O does, it does offers an extraordinary level of quality.

Regarding B&O PLAY's competitors, Sonos and Beats are the main ones. Sonos produces speakers and sound bars and is known for SonosNet, which allows audio to be played simultaneously in separate zones of the user's home. Even though the design is not quite at the same level as B&O, it is reasonable and the products are relatively cheaper than B&O PLAY products. Beats offers headphones, ear buds, portable and wireless speakers, co-branded smart phones and music streaming service. While not offering the best quality – their overpriced headphones have also ranked as the second worst product in the line of 18 other music products (Tech News Today, 2015) – it has been very good in offering a luxurious *image* of the headphones that could be purchased for a far lower price.

Finally, companies such as HARMAN and Sony are much larger in size than B&O in terms of revenues. In FY2015, HARMAN recorded revenues of approximately $7 billion USD and Sony recorded revenues an equivalent to $72 billion USD. B&O, on the other hand, only recorded revenues of 2,356 mDKK ($334 million USD). The group's small scale is a disadvantage in a fiercely competitive market. Overall, I evaluate the degree of rivalry in the industry to be very high (rank 10).

3.1.2.2 *Threat of substitutes – Rank 7*

The threat of substitutes describes the risk of market supplanting by existing or potential substitutes (Fleisher & Bensoussan, 2007, p. 92). A substitute is a product developed by an existing competitor, a newcomer or a company from another industry that is able to satisfy the same needs as the product offered by the firms within the industry (Kotler & Keller, 2012, p. 232).

Consumer behavior is changing at a fast pace, which is affecting the way in-home electronics are being used. The consumers' interest in viewing content on a number of different screens simultaneously has been on the rise, particularly in developed markets. Laptops, tablets and smartphones are fast becoming the screens of choice instead of TVs (Euromonitor, 2016, p. 3). Even though TV sets are being less used, the TV segment still has an opportunity with the smart TVs, which allow consumers to watch online shows on a significantly larger screen (as compared to tablets and laptops) (Euromonitor, 2016, p. 4). I evaluate the overall the threat of substitutes to be medium-high (rank 7).

3.1.2.3 *Threat of new entrants – Rank 8*

The threat of new entrants refers to the threat that new competitors pose to existing competitors in an industry (The Strategic CFO, 2013). The threat of new entrants will be analyzed under three different perspectives: (1) new entrants to the market, (2) existing competitors entering the high-end market and (3) new entrants entering the market through mergers and acquisitions:

Threat of new entrants in the market: The risk that a new entrant can entail to B&O is low. To begin with, the capital expenditures needed are huge and technology is subject to continuously changes and trends. Hence, companies are required to invest intensively in R&D and production facilities – as an example, LG committed $8.7 billion USD to building a new OLED factory in 2015 (Vincent, 2016). A newcomer with no experience in the industry will have a hard time offering both a superior technological ability and an innovative design that is able to represent brand exclusivity, which is essential in the high-end segment.

Existing competitors entering the high-end market: The risk that an existing competitor would enter the high-end market is high. Already, competitors are starting to offer high-end products line in the TV segment like the Philips 55POS901F series and Samsung UNJS9500 series. These products have a superb quality and extraordinary design in common. For existing competitors, entry barriers are less significant, as they already possess the technology necessary to offer extraordinary quality. However, big players still lack of a brand that it is as strong as B&O's.

Mergers & acquisitions: The risk of new entrants (through mergers and acquisitions) in the industry is high. Competition is fierce in the industry, which leads big companies to acquire small players in order to achieve greater efficiency and reach a greater market share. An example of this is Apple's acquisition of Beats in 2014 for a value of $3.2 billion USD (Wikipedia, 2016). Nowadays, thanks to Apple's financial resources and distribution network, Beats has aggressively pursued new market shares (especially outside of the U.S.) and has become one of the main competitors of B&O PLAY.

Even though the risk that a new competitor would enter the market is low, the threat that an existing competitor through extending its product line or that an existing competitor will enter the high-end segment through M&A activity is very high. Thus, I assign a rank of 8 to the threat new entrants.

3.1.2.4 *Threat of buyers' growing bargaining power – Rank 5*

The threat of buyers' bargaining power refers to the ability or power to impose pressure that consumers can exert on firms (The Strategic CFO, 2013).The buyers' bargaining power is higher when the buyers are more concentrated, the product is undifferentiated, the buyers' switching costs are low and/or the buyers are price-sensitive (Kotler & Keller, 2012, p. 232).

Virtually all of B&O's costumers are individuals, which weakens the buyers' bargaining power as long as these individuals do not coordinate their purchase efforts. Most of B&O consumers buy small quantities and are normally not applicable to discounts. B&O's brand is hard to substitute, as there are only few companies that are at the provide the same level of quality, design and status as B&O. Also, B&O's brand has a high degree of customer loyalty. Loyal customers are less likely to be price-sensitive, which decreases the buyers' bargaining power. Overall, I evaluate the threat of the bargaining power of buyers to be low as of right now. However, as there is an increased focus on design and quality by competitors, the bargaining power of buyers is expected to increase over time. This can have an effect on the buyers' bargaining power and, thus, I have assigned a rank of 5 to this threat.

3.1.2.5 *Threats of supplier's growing bargaining power – Rank 6*

The supplier power refers to the ability to exert pressure over businesses by raising prices, lowering quality and reducing availability of their products (The Strategic CFO, 2013).

B&O depends on a large number of suppliers – mostly from Europe and Asia – and strives to maintain long-term supplier relations with regard to the purchase of development services and production goods (Bang & Olufsen, 2014, p. 43). B&O is in a fragile position, as it represents a small business to suppliers. To counteract this, rather than just buying products from suppliers, B&O is on a mission to establish co-operation relationships with several suppliers (Bang & Olufsen, 2014, p. 43).

Furthermore, B&O's products are made of many different standardized components, which are produced by many different suppliers. This makes the bargaining power of suppliers lower: If the supplier starts to act in an abusive way, B&O can find another supplier relatively easy. However, as B&O only buys components with high-quality standards the list of suppliers that B&O can rely on becomes smaller – in turn, increasing the suppliers' bargaining power.

In conclusion, I reckon the bargaining power of suppliers is high, due to B&O's size, supplier's concentration and high switching costs. However, as B&O strives to build long-term relationships with suppliers, I evaluated the threat from suppliers to be medium (rank 6).

3.1.3 Summary of the Nine Forces

By compiling all of the analyses presented in the subsections above I have generated the illustration shown in Figure 3.2.

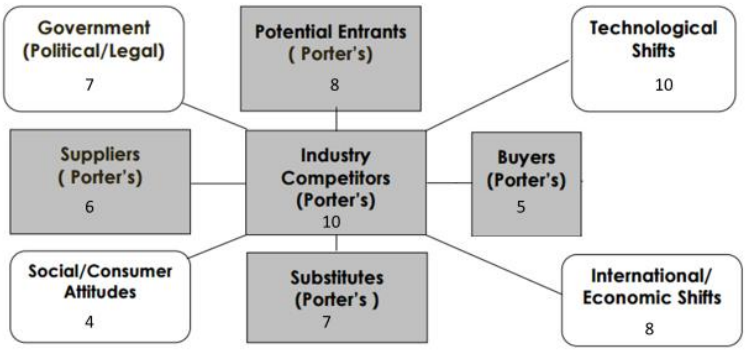


Figure 3.2 B&O's Nine Forces, own creation

Overall, the analysis conducted with the Nine Forces model paint a picture of an external environment with many potential threats. For a company to act in this environment and be able to make profits, good measures must be taken to combat the threats. My analysis shows that the competitiveness in the industry as well as rapid technological advancements in the market make up the most significant

threats. Though, under the leadership of Tue Mantoni, B&O has taken action against these threats – most significantly with its recent technological and licensing partnerships. While the external environment is certainly very fierce in many of the aspects covered by the Nine Forces model, B&O's recent decisions and actions with respect to partnerships immediately seems to be putting B&O in a much better position with respect to the external environment.

3.2 The BCG Matrix

With the Nine Forces model I have been able to analyze B&O's industry. Now I will specifically analyze the following business units: (1) B&O PLAY, (2) Automotive (as part of the licensing business) and (3) Bang & Olufsen. In the Bang & Olufsen business unit, I will analyze the TV, Speaker and Audio product lines.

In order to simplify the analysis of B&O's business units, the BCG Growth-Share Matrix will be used. The BCG Matrix serves as a simple tool for viewing a company's business portfolio at a glance. Though, its simplicity comes at a price: It only considers the market growth as a proxy for industry attractiveness and the market share as a proxy for competitive advantage rather than taking additional factors such as market profitability, market rivalry, brand strength and customer loyalty between others into consideration. This model assumes that the business units can be grouped in four different categories, depending on their market growth and share: Cash Cows, Dogs, Question Marks and Stars (Henderson, 1970).

Cash Cows have a high market share in a mature market. Cash Cows exhibit a return on assets that is greater than market growth rate and, thus, generate a profit, which can be used to fund R&D, debt, etc. Stars have a high market share in a growing market. If a Star can maintain its large market share when the market becomes mature, it will become a Cash Cow, ensuring future cash generation. Meanwhile, Dogs have a low market share and low growth rate, these units generate barely enough cash to maintain the business's market share, which makes them candidates for divesture. Question Marks have a low market share but in a market with a high growth rate. Questions Marks have the potential to gain market share and become a Star (and eventually a Cash Cow when the market becomes mature). However, there is also the risk that they will become a Dog if the business unit is not able to become a market leader. The way a Question Mark develops over time is specifically interesting in B&O's case (Wikipedia, 2016).

3.2.1 B&O PLAY

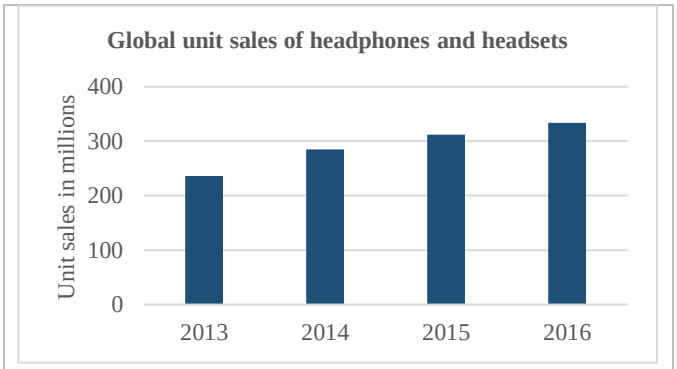


Figure 3.3 Global unit sales of headphones and headsets from 2013 to 2016 (Statista, 2016, p. 9)

B&O PLAY is currently the biggest business unit of B&O representing 37% of FY2015/16 sales and has grown 16.21% CAGR in the last four years. From an industry perspective, the explosive sales growth of smartphones over 2010-2015 of 38% CAGR has been accompanied by also a growing sale of wireless speakers and headphones (Euromonitor, 2016).

The Future Market Insights institution forecasts that the global earphones and headphones segment will increase the sales value at a CAGR of 7.0% from 2015-2025 (Future Market Insights, 2015). In addition, the IHS Markit has forecasted that the annual shipments of wireless speakers will follow an increasing trend in the future (IHS Markit, 2015). Moreover, competition is high with big players like Beats (Apple), Sony, BOSE and Skullcandy. The same is the case with mobile phone manufacturers (such as LG and Samsung) that are starting to increase their presence in this market with the result of increasing competition.

I have classified B&O PLAY as a Question Mark. The market of earphones, headphones and wireless speakers is experiencing high growth rates and it is forecasted to keep growing well into the foreseeable future. B&O PLAY is a small player – though, it has the potential to become a Star over time and be a strong future growth driver for B&O as a whole, if the right growth strategy is implemented. This is because it has a good competitive advantage, offering both style and high quality audio in its products. In addition to that, consumers are shifting expectations towards wireless speakers and they are starting to prioritize audio quality over portability (Euromonitor, 2016). B&O PLAY is in a privileged position to fulfill this new customer expectations and the high growth rates of recent years are indicating that there is an increasing demand for the types of products offered by B&O PLAY. If the high growth rates keep up, the chance that B&O PLAY will become a Star.

3.2.2 Automotive

In 2015, B&O entered into an Automotive brand license agreement with HARMAN. In September 2016, HARMAN announced that B&O PLAY will collaborate with the American automaker Ford in the installation of car sound systems by the start of 2017. The deal with Ford has a promising future. According to a study made in 2016 by the market research and a consulting firm *Ipsos*, the importance

that the car audio brand has in car purchases is increasing significantly, as consumers are willing to pay extra to have high-end brand audio systems in their cars (Ford, 2016). This agreement is of extreme importance, as it will increase brand awareness around the globe to potential B&O PLAY customers: Ford had a global market share of 7.3% in 2015 (Ford, 2015, p. 5). The deal will especially help increasing brand awareness in the U.S., a crucial market for B&O PLAY: 40% of 2015 Ford sales came from the U.S, which represented a 14.7% of the U. S (Ford, 2015, p. 11).

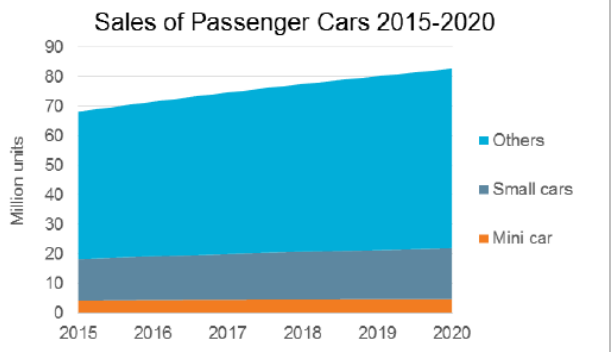


Figure 3.4 Sales of passenger cars from 2015 to 2020 (Euromonitor, 2015, p. 23)

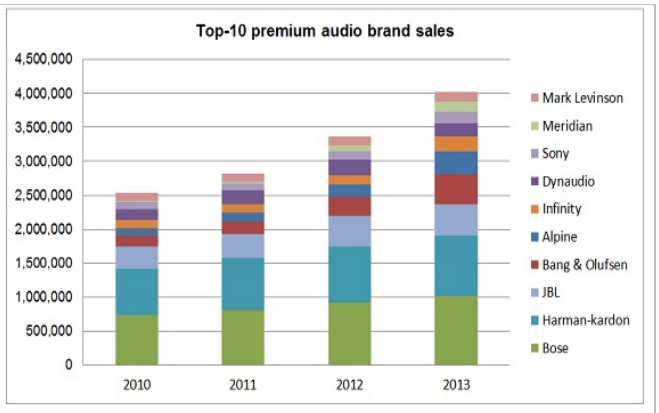


Figure 3.5 Top 10 premium audio car brand sales from 2010 to 2016 (IHS, 2014)

The sales of in-car audio systems is very much linked with the overall success of the automotive industry. Passenger car sales have increased over the last 5 years with a 2.85%[3] CAGR and these are projected to continue growing over 2015-2020 (Euromonitor, 2015, p. 23). As premium audio systems become a differentiator for customers, it is becoming more common that automotive OEMs offer integrated high-end car audio systems. According to IHS, branded audio systems will surpass 9.9 million unit sales by 2021, which accounts for only 14% of the total car audio speaker sales (Li, 2015). This suggests that the key market growth opportunity for branded audio systems lies among volume OEMs (Li, 2015). Through the B&O PLAY and Ford agreement, HARMAN has taken this opportunity by expanding its product portfolio to not only high-end cars but also middle-end cars.

BOSE and HARMAN are the main players in the market. HARMAN is formed by a conglomerate of different automotive brands such as Harman-Kardon, JBL, and B&O. BOSE is the single brand with the most sales but the sum of the HARMAN brands is dominating (IHS Markit, 2014). I have classified the Automotive licensing business as a Star. The branded car-audio industry is growing and this trend is expected to continue in the future. HARMAN's competitive position is strong and B&O can expect to have a steadily increasing licensing revenue from HARMAN going forward.

[3] For more details, please refer to Appendix 6: Global passenger car sales.

3.2.3 The traditional Bang & Olufsen business unit

As the Bang & Olufsen business unit is composed of different product lines, I will study each them individually in order to have a clearer picture of B&O's market position.

3.2.3.1 *Television sets*

B&O is especially suffering in the TV product line. Technological advancements are especially significant in this product line and big players are starting to expand longer into the high-end TV market. To counteract this, B&O announced in March 2016 that it will partner with LG for the research and development as well as the production of OLED TVs.

Global TV volume sales have been decreasing over the last four years by 2.31% CAGR[4], as consumers change their media consumption behavior. Although the overall TV demand has decreased recently, Euromonitor expects the premium TV (Ultra HD and OLED) demand to increase in the next four years (Euromonitor, 2016, pp. 25-26). This can be seen in Figure 3.6 and Figure 3.7.

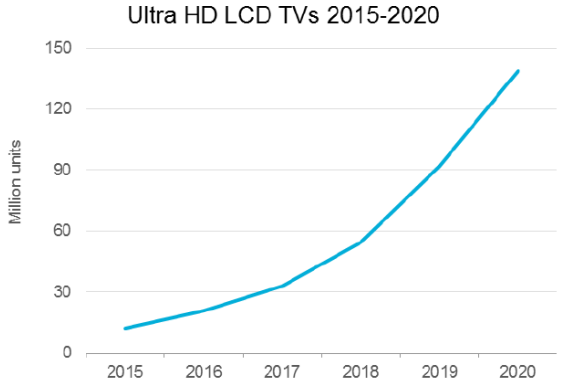


Figure 3.6 Ultra HD LCD forecasted sales 2015-2020 (Euromonitor, 2016, p. 26)

Figure 3.7 OLED forecasted sales 2015-2020 (Euromonitor, 2016, p. 26)

The OLED technology is nowadays championed by LG and Philips recently launched the first Ambilight[5] OLED TV in the market (at the 2016 IFA[6]). Though, the OLED technology is still a bit of an uncertain prospect and it is under the risk of following the same path of the plasma technology. Plasma was launched slightly earlier than LCD TVs and was widely regarded as superior in terms of video quality than LCD displays. However, plasma display manufacturers struggled to produce small panels at competitive prices, which caused them to stop producing plasma TVs (Euromonitor, 2016, p. 12).

[4] For further information, please refer to Table 9.6 in Appendix 5: Euromonitor database.
[5] Ambilight, short for "ambient lighting", is a lighting system for televisions developed by Philips.
[6] IFA is the world's leading trade show for consumer electronics and home appliances.

Panel manufacturers are struggling to drive down the cost of OLED panels and companies like Sony and Samsung have already backed away from OLED because of manufacturing challenges (Vincent, 2016). Samsung has stated that they have developed another technology, the Quantum Dot technology (SUHD), which they defend as being more affordable to manufacture and offering similar results compared to the OLED technology (Pocketlint, 2016). In addition to this, there is still room to improve on existing LCD TVs, which have a much lower cost of production (Euromonitor, 2016, p. 28). Though, in my valuation of B&O, I will assume the OLED technology that LG (and B&O) is betting on will not suffer the same fate as the plasma technology. While the success of the technology is uncertain, the fact that not all manufacturers have backed away from it seems to be an indication of the feasibility of the technology (Circuit Breaker, 2016).

In general, the industry profitability is low for TV sets. Competition is very intense (dragging prices down) and product life cycles are short, increasing R&D costs. Ultra HD LCD TV sets offer a comparable quality to OLED TV sets at a much lower price point, thereby representing a strong substitute. The industry is highly concentrated with the first four manufacturers representing 51.20%[7] of the market share in 2015 – Samsung being the leader (20.80%) followed by LG (15.70%), Hisense (8.7%[8]) and Sony (6%). Furthermore, these companies are starting to launch high-end TV sets, which are compromising B&O's position in the high-end sector.

If B&O had not engaged with LG for the production of TV sets, I would have classified the Television product line as a Dog. Without LG, B&O would be struggling to follow up with the rapid technology developments and the very competitive landscape. However, with the LG deal, B&O is no longer in a disadvantaged position regarding the technology, as B&O will outsource the R&D and production of OLED screens to L&G. B&O now only has to focus on the design and the TV audio system, which reduces the actual cost of producing the TVs significantly. Furthermore, as I have mentioned previously, the high-end market for TV sets is expected to grow and B&O is now in a position to fully take advantage of that. Therefore, I have classified the Television segment as a Question Mark.

3.2.3.2 *Speakers*

Over FY2013/14 and FY2014/15, sales coming from Speakers declined. However, in FY2015/16, sales increased by 17% (representing 19% of the total revenues that year) – mainly as a consequence of the launch of the *BeoLab 90*, a pioneering and award-winning speaker considered to be one of the

[7] For further details, refer to Table 9.4 in Appendix 5: Euromonitor database.
[8] Hisense includes also the company Sharp.

most innovative speakers in the market (Bang & Olufsen, 2016, p. 4). Speakers are under the home audio and cinema market. The global sales for this market has been decreasing over the last four years by 2.7%[9] CAGR. This has been mainly due to the change in consumer's behavior. IHS Markit states that the "growing penetration of tablets and smartphones combined with an ongoing shift in consumer media consumption preferences toward those devices and streaming services such as Spotify, Pandora, and Deezer are collectively driving a behavioral shift in how people listen to music inside and outside their homes" (IHS Markit, 2015). Consumers are now looking for compact solutions such as soundbar systems and wireless speakers. IHS Markit has forecasted that the annual shipments of connected audio products – including wireless speakers, wireless soundbars, and connected AV receivers – are expected to grow at a CAGR of 88% – from 1.5 million units in 2010 to nearly 66 million units in 2018 (IHS Markit, 2015).

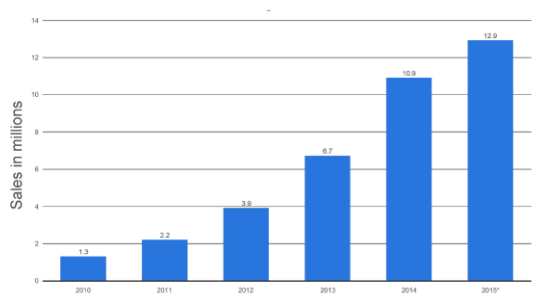


Figure 3.8 Global unit sales of soundbars speakers from 2010 to 2015 (Statista, 2016, p. 13)

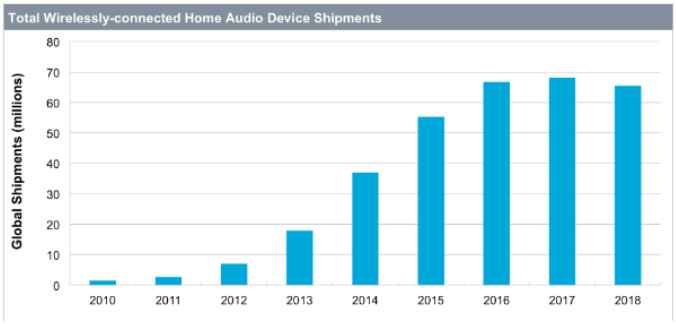


Figure 3.9 Wireless connected home audio device shipments from 2010 to 2018 (IHS Markit, 2015)

Furthermore, IHS Markit also states that "consumers are seeking ways to wirelessly play audio from their mobile devices on speakers in the room they're in, in multiple rooms in a household, and on speakers carried with them while on the go. This geographically diverse need will drive strong global growth in Wi-Fi and Bluetooth connected speakers over the next few years" (IHS Markit, 2015). Following the tendencies in the market, B&O has launched a soundbar speaker, the *Beosound 35*, two wireless speakers, the *Beosound 1* and *Beosound 2*, and a wireless multi-room audio system, the *BeoLink Multiroom*.

The home audio and cinema market is highly concentrated with the three first competitors (Sony, Samsung and Philips) having 36%[10] of the market share. Moreover, in parallel to what is happening in the TV market, competitors are starting to enter the high-end segment. For example, Samsung

[9] For further details, refer to Table 9.6 in Appendix 5: Euromonitor database.
[10] For further details, refer to Table 9.5 in Appendix 5: Euromonitor database.

announced that it will build a new audio lab in an effort to become the number one innovator and manufacturer in the sound game (Digital Trends, 2016).

I have classified the Speaker product line as a Question Mark. The sales of speakers has been declining – however, the sales for wireless speakers and soundbars are on the rise. Moreover, B&O is following the new market tendencies and if it continues to launch products such as the *BeoLab 90* and takes advantage of the know-how gained and apply it to the future speakers, B&O will be able to secure its position in the market.

3.2.3.3 *Audio*

The product line includes two products: *Beosound Moment* and *Beosound Essence*. *BeoSound Moment* is an intelligent, wireless music system that integrates the user's music streaming services into one system. It can gather, curate, display and play music from the iTunes playlists on a computer and/or mobile devices (Bang & Olufsen, 2016). The *Beosound Essence* is a simpler product: It is a one-touch music wireless system, in which the control elements are reduced to the bare essentials. It can stop music, skip tracks, change source and adjust the volume (Bang & Olufsen, 2016).

As there is a growing adoption of mobile devices and rising number of music streaming subscribers, these products do not seem to offer an extra value to consumers. The *Beosound Moment* does not offer anything different from using a tablet to stream wirelessly to the speakers. Meanwhile, from a critical point of view, *Beosound Essence* could be defined as very expensive play button. B&O argues that the *BeoLink Multiroom* functionality will increase the need for separate control devices (Bang & Olufsen, 2016, p. 10) but I reckon that this will not be the case. As various industry reports (e.g., Euromonitor) have clarified, smartphones are very much on the rise and, thus, I do not believe that the Audio products will grow strong and become a significant growth driver for B&O. Because of this, I have classified the Audio segment as a Dog in the BCG Matrix.

3.2.4 Summary of the BCG Matrix analysis

To graphically summarize the analyses, I have compiled the illustration seen in Figure 3.10. At a quick glance, the licensing deal with regard to Automotive audio products can be qualified as a Star while the Speaker and Television product lines as well as B&O PLAY are Question Marks. Only the Audio segment is a Dog. Though, it is interesting that all of three Question Marks have the potential to grow into Stars. It is also interesting from analytical perspective that B&O does not really have any Cash Cows. However, the lacking of a proper Cash Cow might very well be one of the main reasons as to why B&O has not been able to generate any steady profits during the past five financial

years. While the development of B&O's three Question Marks is uncertain, there is a chance that at least one of them could turn into a Cash Cow in the future.

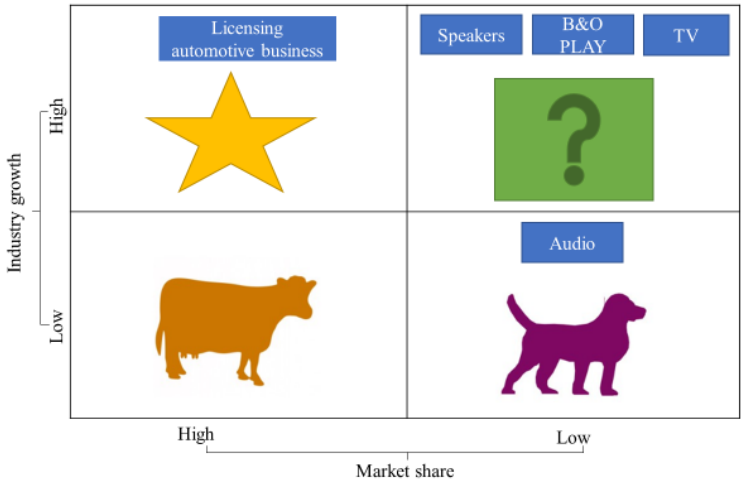


Figure 3.10 BCG matrix applied to B&O, own creation

3.3 SWOT analysis

The SWOT model analyzes both the internal and external environment of a company and, thus, it is a good model to use for summarizing the strategic analysis of B&O. The acronym stands for **S**trengths, **W**eaknesses, **O**pportunities and **T**hreats and the model evaluates the internal workings of an organization by analyzing the company's internal strength (distinctive competencies) and weaknesses. It also analyzes the organization's environment by analyzing its opportunities and threats (Griffin, 2008, p. 67).

The SWOT model will serve as a summary for the external analysis (conducted in Section 3.1 using the Nine Forces model) and the analysis of each of the business units (conducted in Section 3.2 using the BCG Matrix). The summary takes form in the table below:

Strengths	**Weaknesses**
• B&O is notorious for its innovative design, quality of sound, durability and superior craftsmanship and, thus, has a strong brand in the high-end consumer electronics industry. • B&O's partnership with LG, HARMAN and HP, which are especially important for the TV and Automotive segments and B&O PLAY. • Strong distribution network. • The TV and Speaker segments and B&O PLAY all have a promising potential.	• Fast technological advancements in many of the markets in which B&O operates. • Lack of scale in relation to competitors. • Low bargaining power towards suppliers due to its small size. • The Audio segment is rather unattractive and is classified as a Dog.

Opportunities	**Threats**
• All of the BRIC economies (with the exception of China) are expected to recover by 2017. • Mid-lifer population increasing. • Consumers' increasing interest in gathering experiences. • Increasing demand for high-end TVs, connected audio products and headphones and earphones. • Branded car audio systems have plenty of room to grow.	• IMF's global economy growth forecast has been declining in the last months. • Potential risk that the U.S. and Europe fall into a prolonged stagnation and the economic effects of the new American President. • China is vulnerable to a hard landing. • Increasing geopolitical tensions. • More brand-agnostic consumers. • Big players in the industry are moving towards the high-end segment. • Quick changes in consumer preferences. • Shorter product cycles, especially TVs.

Figure 3.11 SWOT analysis, own creation

B&O's main competitive advantage is its brand, due to B&O's excellent reputation within the high-end consumer electronics industry. B&O has been able to take advantage of this very smartly. Through the recent strategic partnerships with HARMAN, HP and LG, B&O has been able to increase the brand awareness, reduce production costs and obtain a licensing revenue. Moreover, B&O has a strong distribution network formed by improved B1 stores (the "Sensory Stores") and an increasing number of third-party retail stores that are helping to increase the brand value and awareness.

B&O's biggest challenge is the rapidly developing technological advancements, which puts B&O in a compromising position along with its lack of scale. Though, B&O is coping with the situation through the recent strategic partnerships. Furthermore, the bargaining power from suppliers is high – but as B&O has established co-operation relationships with several suppliers, they no longer pose a significant threat for B&O. In addition, the Audio segment is not in a good shape and the lack of a solid Cash Cow could potentially bring B&O into a problem of lacking liquidity (once the cash obtained from the ICEpower and Automative sales runs out).

B&O is in a good situation in terms of opportunities. The IMF expects that most of the BRIC countries (except China) will recover by 2017, which should help boost B&O's sales. Also, the increase of the mid-lifer population, the increasing interest of consumer's interest in gathering experiences and the higher demand for high-end TVs, connected audio products and headphones and earphones should have a positive effect over sales. Finally, the branded car audio market is in a strong momentum in terms of growth, which supports future revenue from the HARMAN deal and positively affects B&O's brand awareness within the car audio industry.

B&O is subject to significant threats, though. The United States and the Eurozone are under risk of stagnation and China is vulnerable to a hard landing after its impressive growth over the past decade. Furthermore, if the new U.S. President is to implement damaging protectionist policies, it could have a negative effect on the world economy (The Wall Street Journal, 2016).

In continuation, the rise of agnostic consumers with no specific loyalty to any brand could invalidate B&O's brand value in the future. B&O has to watch out very carefully to the fast changes in consumers' preference in order to avoid situations like the one occurring in the Audio product line (where sales have been highly decreasing due to the fact that these products do not offer an added value to its customers). Finally, big competitors are moving towards the high-end segment of the market, posing a very significant threat to B&O. These companies are leaders in technology and, even though they do not have the same brand value as B&O does at the moment, they could have it in the near future by investing massively in building up their brands.

4 Financial statement analysis

In this chapter, I will make an assessment of B&O's financial situation. The time frame used will be the last three financial years. Initially, I set out to do an analysis covering the past five financial years but due to the sale of the Automotive and the ICEpower business segments in FY2014/15 and FY2015/16, this has not been possible. This is mainly due to the fact that the numbers of these business units could not be separated from the rest of the group. Comparative figures for the FY2013/14 were adjusted in order to reflect the discontinuing operations separated – though, figures for the years FY2012/13 and FY2011/12 were not adjusted (Bang & Olufsen, 2015, p. 8). Thus, the only financial statements that have been adjusted due to these sales have been the ones for the three past years.

I will first analyze the accounting quality of the accounts and adjust the income statement for transitory amounts. After that, I will proceed to reorganize both the income statement and balance sheet into the analytical income statement and the analytical balance sheet for the purpose of using these in the valuation. Finally, I will proceed with evaluating the profitability and liquidity of B&O. I decided not to perform a peer analysis, as B&O does not have many relevant and similar companies to compare with. The closest competitors that could have been used for the analysis are all private companies (BOSE, Sonos, Loewe and more). Also, performing a peer analysis with companies such as Samsung, LG or Sony would not have brought relevant insights to the financial analysis, as these companies are very different in terms of scale and market focus.

4.1 Accounting quality

It is important to evaluate the accounting quality of the financial statements. Companies like Enron have shown that evaluating the accounting quality of the financial statements is important, as there is a probability that the reports may include manipulated numbers (Petersen & Plenborg, 2012, p. 333). A good level of accounting quality is the one that provides an objective picture of a firm's financial situation and serves as an indicator of future earnings. There are a number of issues that can affect the accounting quality from which the following will be studied (Petersen & Plenborg, 2012, p. 334):

- Application of accounting policies and
- accounting items or events that are regarded as permanent versus transitory.

4.1.1 Application of accounting policies

As part of a new law enforced that obliges publicly listed companies in the EU to adopt the IFRS (International Financial Reporting System) as of 2005, B&O has issued its annual reports following the IFRS standards (Bang & Olufsen, 2006, p. 43), which ensures the comparability throughout the period of analysis. During this period, IFRS has made some changes including new and amended standards and interpretations – though, these have not had a significant impact on recognition and measurement. Rather, they have led to further specifications in the notes and in the consolidated statement of comprehensive income (Bang & Olufsen, 2014, p. 55). Therefore, no adjustment has been proceeded in this matter.

4.1.2 Accounting items or events regarded as permanent versus transitory

In order to increase the accounting quality, reported accounting numbers should be adjusted to remove transitory items to make them comparable over time and across others companies. Transitory items will be analyzed and removed or added from the income statement. Failing to do so may give a more positive or more negative picture of the company. I have gone through the different relevant transitory items from FY2013/14 to FY2015/16, and in *Appendix 7: Adjusted income statement from transitory items*, the reader will find the income statement including two columns for each financial year: one including the original numbers reported by B&O and the other column including the adjusted items.

4.1.2.1 *FY2013/14*

B&O reported that capacity costs included net non-recurring costs of 5 mDKK, which included a non-recurring gain of 11 mDKK related to a sale and leaseback of the land and production facilities owned by B&O in the Czech Republic (Bang & Olufsen, 2014, p. 9). The net non-recurring cost is not related to the core business and, as such, it will be added back to the capacity costs.

4.1.2.2 *FY2014/15*

As a consequence of the Automotive transaction, capacity costs included 484 mDKK of non-recurring and aperiodic, non-cash items as well as costs for shared functions and license fees previously allocated to the Automotive business (Bang & Olufsen, 2015, p. 4). This non-recurring amount has been added back to capacity costs.

4.1.2.3 *FY2015/16*

The relevant transitory items that occur in this year had a net effect of 72.9 million DKK including:

- M&A expense of 9 million DKK resulting from the dialogue regarding a potential launch of a takeover offer (Bang & Olufsen, 2016, p. 12).
- Restructurings costs of 16 million DKK: 10 million DKK were costs related to the announced changes in Executive Management Board and 6 million were related to the restructuring in the Bang & Olufsen segment (Bang & Olufsen, 2016, p. 12).
- A total write-down impairment of 36.6 million DKK, which includes 13.6 million DKK of impairment losses in tangible assets (Bang & Olufsen, 2016, p. 76) and impairment losses of company operated stores of 23 million DKK (Bang & Olufsen, 2016, p. 12).
- A severance pay cost of 15.4 million DKK to Tue Mantoni, of which 6.1 million DKK is related to share-based payment (Bang & Olufsen, 2016, p. 64).
- B&O also recorded non-recurring gain during this period of a value of 4.1 million DKK due to the sale of non-current assets (Bang & Olufsen, 2016, p. 100).

4.2 Reorganizing the financial statements

In financial statements, both financial and operations items are reported together with no classification between the two. The company's operation is the primary driving force behind value creation and therefore it is important to isolate (Petersen & Plenborg, 2012, p. 68). In order to differentiate between financial and operation items, I will reorganize both the income statement and balance sheet.

4.2.1 Analytical income statement

Depreciations, amortizations and impairments are included in capacity costs. Thus, they should be subtracted from the different capacity costs items (R&D costs, distribution and marketing costs and administration costs), as they do not account for operation expenses but are non-cash expenses. Though, because B&O's notes were not sufficiently detailed, it was not possible to correctly estimate the corresponding depreciation amounts for the different capacity cost items. To prevent wrongly estimating the amounts, I decided to not proceed with this subtraction.

Share of results after tax from associated companies was classified as a financial item. This was decided because the associated company, John Bjerrum Nielsen A/S, is not related to the core business of B&O. Furthermore, taxes were modified. Since reported tax is positively affected by net financial expenses, the tax advantage (tax shield) was added back to have a clear picture of the performance of B&O's operations (Petersen & Plenborg, 2012, p. 73). For more details about the analytical income statement please refer to Appendix 8: Analytical income statement.

4.2.2 Analytical balance sheet

Following the balance sheet classification of accounting items, I will group assets and liabilities between operational and financial. I will start out with the assets in the section below.

4.2.2.1 *Assets*

The deferred tax asset was classified as an operating item, as much of the amount is related to operating activities (non-current assets, inventory and receivables). Furthermore, trade receivables were also classified as an operating item, as B&O has stated that trade receivables are non-derivative financial assets with fixed or determinable payments that are quoted in the market (Bang & Olufsen, 2016, p. 79). On the other hand, all items related to the associate – such as receivables from associates, investment property, investments in associates and other financial receivables – were classified as a financial item, as they are not related to the core operations. Furthermore, assets held for sale were classified as a financial item, as these are assets that are going to be sold and are not related to the continuing business anymore.

In financial reports, cash is reported including both excess cash and cash related to day-to-day operations. If the cash position remains stable over time it is fair to treat it as excess cash (Petersen & Plenborg, 2012, p. 77). If this is not the case, normally, rules of thumb are used to estimate the operating cash – e.g., 2% of the sales revenue (Damodaran, 2005, p. 12). In the case of B&O, cash holdings have not been stable in the last three years due to the sale of the Automotive and ICEpower business units. However, I decided that all cash will be classified as excess cash, as the variance of cash was related to the sale of business units and not due to fluctuations on the operating activity side. For more details about the analytical balance sheet please refer to Appendix 9: Analytical balance sheet.

4.2.2.2 *Liabilities*

Mortgage loans and loans from banks have been classified as financial items, as they are interest-bearing and they are not related to operations (Bang & Olufsen, 2014, p. 84). Furthermore, both liabilities associated with assets held for sale and overdraft facilities have been considered as financial

items. Assets held for sale are not linked to the core business as previously mentioned. On the other hand, other liabilities have been classified as an operating item, as most of the disclosed amounts are related to operations such payroll-related items, taxes and duties (Bang & Olufsen, 2012, p. 91).

4.3 Profitability and liquidity analysis

I will now study the profitability and liquidity of B&O. In the profitability analysis, I will examine the ability that B&O has to manage expenses and to produce profits from sales (using the DuPont model) while, in the liquidity analysis, I will examine the ability of B&O to meet its debt obligations.

4.3.1 Profitability analysis

Measuring a company's profitability is one of the key areas of financial analysis. The historical profitability is an important element in defining the future expectations of a company (Petersen & Plenborg, 2012, p. 93). The return on equity (ROE) measures the profitability taking into account both operating profitability and financial leverage:

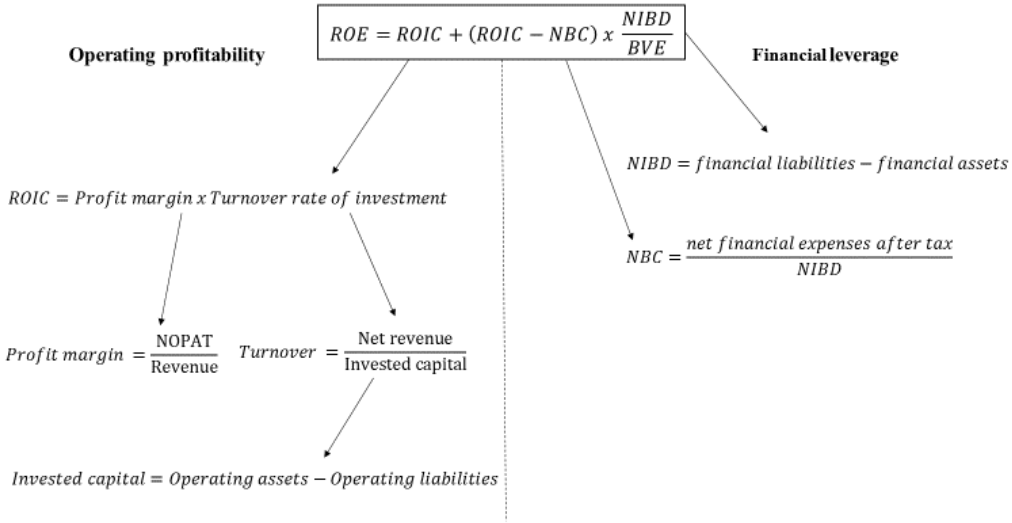


Figure 4.1 Profitability analysis using the DuPont model, own creation

The ROIC (return on invested capital) measures the overall profitability for operations. The ratio expresses the return on capital invested (NOPAT) over the firm's net operating assets (invested capital). ROIC, though, is not able to explain whether the profitability is driven by a better revenue-and-expense relation or by an improved capital utilization (Petersen & Plenborg, 2012, p. 107). For this reason, it is necessary to decompose the ratio into profit margin and turnover rate of invested capital.

Moreover, the financial leverage effect is measured by net borrowing cost (NBC) and the financial leverage $\left(\frac{NIBD}{BVE}\right)$. If ROIC is higher than the NBC, the effect of leverage over ROE will be positive. In the contrary case, it will be negative.

4.3.1.1 *ROIC*

Operating profitability	FY 2013/14	FY 2014/15	FY 2015/16
ROIC	-11%	-26%	-11%
Profit margin	-9%	-10%	-4%
Turnover rate	1.15	2.55	2.68

Table 4.1 ROIC FY2013/14-FY2015/16

B&O's ROIC has been negative for the last three years. It has fluctuated between -11% and -26%, which means that B&O has not been able to make profit on its operations. If one examines the ratio further, it is clear that the turnover rate of investment capital has actually improved significantly from 1.15 to 2.68. It seems that what is dragging down B&O's ROIC is the profit margin, which has been negative the last three years. However, the profit margin has significantly improved in FY2015/16, which gives a hope that B&O might be able to reach a positive profit margin soon (that is of course only if the improvements continue).

4.3.1.1.1 Trend analysis and common size analysis

In order to be more concrete in why the ROIC has evolved the way it has, a further analysis will be done by performing an index analysis (trend analysis) and a common size analysis on both the analytical income statement and the analytical balance sheet. Indexing is a suitable method to quickly identify trends in various items on both the balance sheet and income statement. Though, indexing does not reveal the change on the relative size of each item. That is where common size analysis comes into play to further complement the analysis. Common size analysis scales each item as a percentage of revenue (for the income statement) and invested capital (for the balance sheet) (Petersen & Plenborg, 2012, pp. 111-113). For more details, please refer to Appendix 10: Income statement: Trend and common size analysis and Appendix 11: Balance sheet: Trend and common size analysis.

4.3.1.1.1.1 Analytical income statement

B&O's revenues have increased 22% over the last three years but production costs also increased by 26% – accompanied by an increase of 2.23% of its relative size compared to sales, which affected B&O's gross margin negatively (from 38.3% in FY2013/14 to 36.15% in FY2015/16). Administration costs have increased by a higher rate than sales (by 59%) and its relative size has also increased by 0.92% from FY2013/14 to FY2015/16. On the other hand, B&O is doing a better job in terms of distribution and marketing costs and R&D costs, which grew at a lower rate that sales revenues (1% and 8% respectively), and its relative size towards sales decreased from FY2013/14 to FY2015/16, by 5.75 % and 1.59% respectively. Despite the lower distribution and marketing costs and R&D costs,

these were not enough to offset the higher production and administration costs. Thus, the profit margin has not become positive but B&O has managed to make it less negative over the period.

4.3.1.1.1.2 Analytical balance sheet

Invested capital has decreased 48% from FY2013/14 to FY2015/16 – mainly due to a decrease in operating assets of 29% and an increase in operating liabilities of 16%. On the assets side, the elements with the highest decrease were inventories (with a decrease of 25%) and receivables (with a decrease of 24%). However, not all operating assets decreased with the deferred tax asset being the one with the most significant increase of 15%. This is due to the negative results during the past years.

On the liability side, deferred income increased 521% from FY2013/14 to FY2015/16 and its size towards invested capital increased from being 1.8% in FY2013/14 to 17.95% in FY2015/16. The increase in deferred income is linked to the licensing agreement with HARMAN and represents the future license income and the aluminum production agreement (Bang & Olufsen, 2016, p. 85). The decrease of invested capital and increase of sales has increased the turnover rate significantly.

4.3.1.2 *Financial leverage*

To study the financial leverage's effect on profitability, computing the net borrowing cost and the net interest-bearing debt is necessary. This is done in Table 4.2.

Financial Leverage	FY 2013/14	FY 2014/15	FY 2015/16
NIBD	279.2	-996.2	-742
Net financial expenses after tax	20.43	-3.33	32.09
Book value of equity	1604.4	1921.4	1724.9
NBC	7.3%	0.3%	-4.3%
NIBD/BVE	17%	-52%	-43%
(ROIC-NBC) * (NIBD/BVE)	-3.11%	13.68%	2.88%

Table 4.2 Financial leverage FY 2013/14-FY 2015/16

In FY2014/15 and FY2015/16, due to the sales of the Automotive and ICEpower businesses, B&O had net interest bearing assets rather than a net interest bearing debt, causing the NIBD/BE ratio to be negative for these years. Furthermore, the effect of leverage over ROE has been positive for FY2014/15 and FY2015/16, while it has been negative for the FY2013/14.

4.3.1.3 *ROE*

The strong overall growth in sales revenue combined with an invested capital reduction has improved the usage of B&O's assets – but B&O is still struggling to control costs resulting in negative profit margin. Nonetheless, it is important to point out that it has been improving over the period. Still, having a negative ROE means that B&O is not able to offer a positive return to its shareholders.

Profitability	FY 2013/14	FY 2014/15	FY 2015/16
ROE	-14%	-12.7%	-8%

Table 4.3 ROE FY 2013/14-FY 2015/16

4.3.2 Liquidity analysis

Liquidity is a crucial subject for any business – especially for B&O as it has not provided positive returns in recent years. The ability to meet all short and long term commitments is essential in order to be able to act freely and exploit profitable business opportunities. Lack of liquidity may limit the management's freedom of action, reduce the potential for profitable investment opportunities, force managers to divest profitable business with a substantial discount and increase financial expenses (Petersen & Plenborg, 2012, p. 150). Thereby, it is always important to analyze the liquidity, as liquidity and the future of a company are highly connected – especially for B&O as it is under a high uncertainty at the moment. Table 4.4 include variables, which evaluate the liquidity of a company:

Liquidity ratios	FY 2013/14	FY 2014/15	FY 2015/16
Cash burn rate[11]	3.6	6.2	11.3
Free cash flow, original	(101.0)	913.0	(187.0)
Free cash flow, adjusted[12]	(101.0)	(219.3)	(239.1)

Table 4.4 Liquidity ratios FY2013/14-FY2015/16

The cash burn rate measures the short-term liquidity risk and is typically only used for companies with negative earnings. It shows how many months a company can continue assuming the current performance and without any additional funding from shareholders or debtholders (Petersen & Plenborg, 2012, p. 158). It is measured by the formula:

$$Cash\ burn\ rate = \frac{Cash\ and\ cash\ equivalents + securities + receivables}{EBIT}$$

During the period, B&O's cash burn rate improved from 3 months of operations in FY2013/14 up to 11 months in FY2015/16. Much of the improvement came from the sale of the Automotive and ICEpower business segments. Though, this has not stopped the free cash flow from remaining negative and, indeed, becoming worsened. Even with no adjustments done, the free cash flow was negative in FY2015/16 (-187 million DKK). B&O needs urgently to turn its free cash flow positive in order to be able to survive in the long term. The sale of the B2B businesses has given B&O more time to fix

[11] For further details about the calculation, please check Appendix 13: Cash burn rate.
[12] To get a clearer picture of B&O's cash flow, Cash Flow from Operations has been adjusted to remove the effect of the sale from the ICEpower and Automotive business. Please refer to Appendix 12: Adjusted cash flow statement.

its liquidity problems but B&O should tackle this problem urgently, as continuing negative free cash flows will threaten its survivability.

5 Valuation

There are four approaches to valuation (Damodaran, 2002, p. 17): intrinsic, relative, contingent claim and asset-based valuation. Intrinsic valuation estimates the value of an asset by estimating the future cash flows a company can generate over time and discounts them at an estimated risk-adjusted rate. Moreover, in relative valuation the value of a business is derived from the pricing of a comparable business by standardizing common variables such as earnings, cash flow, book value or revenues. Furthermore, contingent claim valuation calculates the value of a company using option pricing models. The contingent claim valuation originated at the acceptance that, in some cases, the value of an asset may be higher than the value estimated with intrinsic valuation if cash flows are dependent on an event to occur. Finally, asset-based valuation models are based on the premise that individual assets can be valued and aggregated, arriving at a total company value (Damodaran, 2002, p. 31).

For companies with substantial uncertainty about the future, which is the case of B&O, the intrinsic value and the market price may significantly differ (Damodaran, 2002, p. 19). Therefore, I will use the intrinsic approach to valuate B&O, as this approach estimates the value of an asset upon its fundamentals and it does not rely on market prices. The other three approaches would not be appropriate to use. To begin with, the relative valuation approach estimates the value of a company using standardized values from comparable peers, which is not reasonable since B&O's closest competitors are private companies and those, which are public, are very different in terms of scale and market focus. Moreover, the contingent claim approach would not be appropriate either, as B&O is not under a contingent on the occurrence or non-occurrence of an event (e.g., patents or product options) that could have an effect on its future cash flows. Finally, B&O, and especially B&O PLAY, is expected to grow substantially in the near future (as explained the strategic analysis) and the asset-based valuation approach does not consider the growth potential and market assessments (Damodaran, 2002, p. 31). Hence, I will disregard the three latter approaches and focus solely on the intrinsic approach.

5.1 Intrinsic valuation

In intrinsic valuation, the asset value is calculated in a fundamental way and it is based on its expected cash flows, growth and risk. There are four approaches under intrinsic valuation: (1) the dividend discount, (2) the discounted cash flow, (3) the excess return and (4) the adjusted present value (Petersen & Plenborg, 2012, pp. 213-224).

The dividend discount approach assumes that the equity value of a firm depends only on the future dividends and the required return on equity (Petersen & Plenborg, 2012, p. 214) while the discounted cash flow (DCF) valuation assumes that the value of an asset is the present value of its expected future cash flows. The DCF approach estimates the equity value in two different ways (Petersen & Plenborg, 2012, p. 216): (1) One that calculates the enterprise value of a firm and subsequently subtracts the company's net-interest bearing debt and (2) another that calculates the equity value of a company directly. Both cash flows and discount rates differ. However, if these are consistent, both approaches will reach the same equity value (Damodaran, 2002, p. 20).

The first way uses the free cash flow to the firm (FCFF) as expected cash flows, which refers to the cash flows from assets prior to any debt payments but after the firm has reinvested to create growth assets. It uses the overall cost of capital to the firm as the discount rate – i.e., the weighted average cost of capital (WACC). The present value is the value of the entire firm and reflects the value of all claims on the firm (Damodaran, 2002, p. 20). The adjusted present value approach is a variant of this model, as it also uses the FCFF as expected cash flows but accounts for the tax shield on net interest bearing debt separately and replaces the WACC by the rate on return on assets (Petersen & Plenborg, 2012, p. 223). The second way uses the free cash flow to equity (FCFE) as expected cash flows, which are the cash flow from assets after debt payments and after making reinvestments needed for future growth. This approach uses the rate of return on equity as the discount rate. The present value represents the equity claims on the company (Damodaran, 2002, p. 19).

The excess return approach relies on accrual accounting and it is specified in two ways: economic added value (EVA) or residual income (RI). The EVA model estimates the enterprise value of a company while the RI estimates the equity value of a company (Petersen & Plenborg, 2012, p. 219). Both models rely on the surplus value created by a firm on its existing investments for its estimations and, if well estimated, should yield the same equity value.

As the choice of approach should not in theory have an effect over the estimated equity value (given the same circumstances and a complete market transparency), I decided that I will use the approach, which will provide me with the easier estimates to understand. This is the excess return approach. When using this approach, it becomes clear that the estimated market value of equity exceeds the book value when returns exceed the cost of capital (Petersen & Plenborg, 2012, p. 223). Specifically, I will use the EVA model to estimate B&O's equity value.

5.1.1 Economic Value Added (EVA)

To compute the EVA, three inputs are needed:

- the return on capital earned on investments (NOPAT),
- the cost of capital for those investments (WACC) and
- the capital invested in them (invested capital) (Damodaran, 2002, p. 1223):

$$EVA_t = NOPAT_t - WACC\ x\ invested\ capital_{t-1}$$

The EVA model assumes that that all spare cash is paid out as dividends each year or is used to fund investments with a net present value of 0. To obtain the enterprise value, the EVA model uses the invested capital from the last financial year (t=0) and then adds the present value of all future EVAs. To arrive at the equity value, it is necessary to remove the last financial year's net-interest bearing debt from the enterprise value.

Following Damodaran's recommendation, I decided to use a two-stage growth model in order to allow for changes in the sales revenue growth in each year. Damodaran argues that this approach is prudent for very young firms or for firms with negative operating margins, which is the case for B&O (Damodaran, 2002, p. 444). In a two-stage growth model, the firm value depends on the EVA, the weighted average costs of capital (WACCs) for both the high-growth stage and the mature storage, the terminal growth rate and the number of years of the high-growth period – i.e., the number of years until the company to becomes mature (Petersen & Plenborg, 2012, p. 220):

$$Enterprise\ value_{t=0} = Invested\ capital_{t=0} + \sum_{t=1}^{n} \frac{EVA_t}{(1+WACC)^t} + \frac{EVA_{n+1}}{WACC - g} * \frac{1}{(1+WACC)^n}$$

5.2 Valuation inputs

In this section, I will estimate the inputs required for the EVA model. I will first decide upon the length of the high-growth period and the stable growth rate. Afterwards, I will develop a pro-forma income statement and a pro-forma balance sheet in order to calculate the future NOPAT and invested capital values. Lastly, I will calculate the cost of capital (WACC).

5.2.1 Length of the high-growth period

According to Damodaran, assessing the length of the high-growth period of a firm is one of the most difficult tasks when determining the value of a growing company. Though, one thing that remains clear is that the period of high growth cannot last forever (Damodaran, 2002, p. 432). First of all, in

the best case, the continued high growth of a firm will naturally lead to the firm increasing in size, which in turn will become a barrier to its own growth. In the worst case, the firm may not survive during the high-growth period and may be liquidated. Second, the growth of the company comes from the fact that the firm is able to generate excess returns on their marginal investments. That essentially means that the return on capital for the high-growth firm is in excess of its cost of capital. When a firm grows, it will earn excess returns for some period of time, which will naturally attract competitors. This will ultimately drive down excess returns resulting in a slowdown of the growth.

Damodaran suggests examining at least three factors when attempting to assess the length of an upcoming period of high growth for a company (Damodaran, 2002, pp. 432-433): (1) The size of the firm, (2) its existing growth rate and excess returns and (3) magnitude and sustainability of competitive advantage. The argument is that the smaller a firm is in comparison to the size of the market in which it operates, the more likely it is to be able to generate excess returns and maintain these excess returns than its larger competitors according to Damodaran.

Empirical studies of companies in growth periods by Damodaran as well as other researchers (Greiner, 1998) find that, in general, companies are able to sustain high growth rates for about 4 to 10 years. While there is no hard rule on for how long (or how short) a company is able grow at high rates, these empirical findings serve as a reasonable frame for assessing a justifiable high-growth period length. In assessing the length of B&O's period of high-growth, I have taken these empirical findings into consideration.

Based on the suggestions of Damodaran and the strategic analysis, I will argue that the length of B&O's upcoming high-growth period will be approx. 7 years. To support this argument, I will examine each of the business units and their corresponding product lines and make an assessment of each line's sales growth rates. Thus, I draw the conclusion that B&O will be able to sustain a high level of growth approximately until the financial year 2023/24.

5.2.2 Stable growth rate

The stable growth rate is important, as it is a value that is constant forever. Since no firm can grow more than the economy that it operates in forever, it is logical to set the growth rate of the economy as a cap. If the company operates internationally, which is the case for B&O, the growth rate of the global economy should be the limiting value (Damodaran, 2002, p. 429). I calculated the average

global GDP growth over the last 55 years to be 3.52%[13] per year. The inflation rate acts as the lower limit for stable growth as "in an inflationary environment, a company that is not changing its economic position will still exhibit growth at the rate of inflation" (Rotkowski & Clough, 2013, p. 10).

The probability that B&O's stable growth rate will be lower than the global growth is high, as the GDP growth rate is the combination of both startups, high-growth firms and mature firms, which may have very different growth rates (Damodaran, 2002, p. 430). As it is unlikely that B&O will reach the relevance that companies such as LG and Samsung have in the global economy, it seems reasonable to assume a value between the average global growth rate and the Danish inflation rate (which 10-year average was 1.55%[14]) for the stable growth of B&O after the high-growth period. It is sensible to use the inflation rate in the local currency if cash flows in the valuation are calculated using that local currency, which I will be doing in this valuation (Damodaran, 2016). I will assume that B&O's stable growth will be 2.54% annually, which is exactly the middle value between 1.55% and 3.52%.

5.2.3 The pro-forma statements

I will develop the pro-forma financial statements by the sales-driven forecasting method, which assumes that accounting items are driven by the expected level of activity (i.e., sales growth). I decided not to use the line-item approach, as it requires an extensive level of information on each accounting item that I do not have. Also, the sales-driven forecasting method has a better link between the activity level in a company and the related expenses and investments (Petersen & Plenborg, 2012, p. 175).

I have designed a template based on the one developed by Petersen & Plenborg (Petersen & Plenborg, 2012, pp. 177-181). Different value drivers will be forecasted in order to arrive at a pro-forma income statement and balance sheet. Furthermore, as the current strategy is a continuation of the "Leaner, Faster, Stronger" strategy, I will use the last five financial years as a reference. The resulting pro-forma income statement and balance sheet are placed in Appendix 14: Pro-forma income statement and balance sheet**.**

5.2.3.1 *Value drivers: pro-forma income statement*

In this section, I will study the different value drivers that are needed in a pro-forma income statement.

[13] Data found on: http://bit.ly/1O91l0M
[14] Data found on: http://www.inflation.eu/inflation-rates/denmark/historic-inflation/cpi-inflation-denmark.aspx

5.2.3.1.1 Sales revenue growth rate

Forecasting sales correctly is crucial, as almost all the value drivers from the template are derived from sales and, therefore, proper sales estimation is essential for a precisely estimated equity value. I will forecast the sales revenue growth for each business unit/product line and summarize all of the projected sales for each of the lines into one value.

5.2.3.1.1.1 B&O PLAY

In B&O PLAY's first financial year (FY2012/11), the new unit delivered revenues of 378 million DKK. Since then, the division has grown with annual growth rates between 1% and 58%. Please refer to Table 5.1 for an overview of B&O PLAY's revenue growth.

FY	Revenue of B&O PLAY in mDKK	Annual growth	Weekly growth
2011/12	378		
2012/13	532	41%	0.66%
2013/14	535	1%	0.01%
2014/15	614	15%	0.27%
2015/16	970	58%	0.88%

Table 5.1 Revenue growth of B&O PLAY from FY2011/12 to FY2015/16

While it is hard to determine when B&O PLAY will reach a mature state based on its varying growth rates since its inception, I will argue that it will take at least another seven years before this happens. Given that the growth of B&O PLAY has not yet reached a steady level over the course of its lifetime (maybe with the exception of the last financial year), it seems as if B&O PLAY still has not reached its full potential. As the new CEO Henrik Clausen's main objective is *growth* (Berlingske Business, 2016), I believe that Clausen will lay a new growth strategy for B&O PLAY.

Moreover, in a recently released study in Financial Review, researchers found that it takes 7.7 years for the average successful startups from incorporation to its initial public offering (Cumming, et al., 2016). The IPO of a startup is arguably a sign of maturity. By the time of writing this thesis, B&O PLAY has been in existence for about four and a half years and, thus, would require at least three more years to achieve maturity if it were to follow the norm for successful startups. An article from TechCrunch, the world's leading startup media, states that successful startups in the CrunchBase database take 8.25 years before reaching their IPO (TechCrunch, 2013).

As explained in Section 2.3.2, the global market for earphones and headphones is expected to grow in the years until 2025 (Future Market Insights, 2015) while the market for wireless audio will grow until 2018 before it flattens out (Euromonitor, 2016). The proven demand for B&O PLAY's product

combined with the fact that Euromonitor foresees that consumers will purchase more expensive electronics equipment by 2021 (Euromonitor, 2016), there is a reasonably good outlook. B&O PLAY operates in an expanding market and while there is a fierce level of competition in the market (as analyzed in Section 3.1.2.1.2), there is definitely a strong growth opportunity for B&O PLAY from a sales perspective.

I forecast that B&O PLAY will be able to keep up its growth rate of last year. While the growth rate of B&O PLAY in Q1 of FY2016/17 actually dropped to 41% (Bang & Olufsen, 2016, p. 11) from 62% in Q1 of FY2015/16 (Bang & Olufsen, 2015, p. 10), I believe Henrik Clausen will be able to accelerate the growth of B&O PLAY based on its strategic situation. Moreover, I forecast that B&O PLAY's growth rates over the next five to seven years will roughly follow an S-curve (or a sigmoid function), as this is "a more accurate description of the business model trajectory [of startups]" (Maurya, 2016). Based on my strategic analysis and the empirical evidence from other tech startups, I forecast that B&O PLAY will reach annual sales of approx. 5.9 billion DKK by FY2022/23. This seems reasonable when keeping in mind Tue Mantoni's own expectations for the growth of B&O (Bang & Olufsen, 2012, p. 33).

Due to the drop in the growth rate for Q1 of the current financial year (compared to last year's result), my assessment is that B&O PLAY will not initially be able to present an annual growth rate at a level similar to that of last year's result. Therefore, I have estimated a growth rate of 40% (rather than last year's 58%) for the current financial year. However, this is to increase in subsequent years because of the reasons presented in the strategic analysis as well as the arguments above. I have estimated the annual growth rate of B&O PLAY to be 50% in FY2017/18, 60% in FY2018/19, 30% in FY2019/20, 20% in FY2020/21 and 10% in FY2021/22, whereafter it will flatten out.

5.2.3.1.1.2 Television

The growth rates of the Television product line in B&O have been swinging a lot during the past couple of years. Though, as explained in Section 3.2.3.1, B&O's TV business is currently in a very interesting position. While competition in the TV industry is fierce and is driving down profit margins, B&O has positioned itself well with the recent deal made with LG. The deal allows B&O to stay a relevant player in the market without having to invest heavily in the research and development of new TV panel technologies.

B&O will be able leverage the latest TV panel technology developed by LG while focusing on its core value-adding activities such as design, acoustics and home integration. B&O has stated it will

release its first TV sets based on LG technology in 2017, which will potentially already have a positive effect on the current financial year's final report (depending on the date of release, obviously). Thus, I believe that B&O will be able to achieve a moderate level of growth in FY2016/17 of approximately 5%.

Figuring out how long the period of significant growth rates in the TV segment will be as a result of the LG deal is hard. Though, an academic study by Michel Habib and Pierre Mella-Barral in the Review of Financial Studies (Habib & Mella-Barral, 2007) finds that the average duration of a joint venture is 7.12 years. While the B&O and LG deal is not strictly a joint venture, the deal does carry some traditional JV characteristics – e.g., B&O and LG each have their own unique competencies that they bring to the deal like traditional JV partners do. In addition to the average duration of JVs, the researchers find that "joint ventures can be permanent when the partners have similar cost of effort." On the other hand, the researchers also find that joint ventures are always temporary (and often short-lived) when there is a large discrepancy in the partners' costs of efforts.

In B&O's deal with LG, both partners arguably carry a roughly equal cost – with B&O bearing sales, marketing and costs to R&D of design, acoustics and home integration and LG bearing the R&D and production costs of the panels. Whether this balance of costs will shift – and, thus, affect the duration of the partnership – is hard to determine at this stage. Thus, I will simply assume the deal to last for at least 7 years in accordance with Habib and Mella-Barral's findings.

In conclusion, B&O is in a good place to leverage its LG deal to drive up sales while lowering costs. Starting in 2017, I reckon that B&O will be able to grow its TV sales by higher rates than what has been the case on average during the past financial years. Hence, I forecast that TV sales will increase by 10% in FY2017/18, 15% in FY2018/19, 10% in FY2019/20, 12% in FY2020/21 and 10% in FY2021/22 before then flattening out in subsequent years. While Figure 3.7 shows that the market is expected to grow by approx. 34% per year during the five-year period, I do not believe that B&O will be able to keep up with the massive growth in the market, which will likely be driven by players such as Philips and LG.

The reason for the slowdown in FY2019/20 before then picking up again is directly linked to the forecast of OLED TV sales by Euromonitor (see Figure 3.7). Like the case of B&O PLAY, I estimate that the TV segment will experience a period of growth rates higher than normal during the upcoming 7 years as a result of the LG deal before flattening out and resembling those of mature companies.

5.2.3.1.1.3 Audio

The Audio product line has been suffering from a financial perspective in the past years' financial statements with an average decline in sales during the past three years of 21%. The financial statements make it obvious that this segment covers products that historically have not been demanded by the market to a very large extent. As explained in the strategic analysis of the Audio product line, the products in this category do not seem to have a very strong outlook, either – especially when taking the current trend of increasingly using smartphone apps to control music and speaker systems into consideration. Due to the increasing digitalization of music and the control of music, it seems as if physical control options have a smaller place in the market and that consumer demand for music control will go in the direction of smartphone apps to a much higher degree.

In lack of consumer studies on customer demands for the types of products B&O has in this segment, it is hard to assess the future growth/decline rate of this segment. Though, as supported by the strategic analysis of the segment, it seems clear that segment will experience further declines in sales in the years to come. Therefore, I assume the segment to decline by the average rate of decline of the past three financial years (equivalent to -21%) over the next many years.

5.2.3.1.1.4 Speakers

Unlike the Audio product line, the Speaker product line is in much better shape and represents a much more important business unit for B&O. As explained, the Speaker product line includes strong B&O products that are much more in line with what customers are demanding and, thus, I reckon the product line will have a much more positive outlook from a sales and financial perspective than Audio.

Products like soundbar systems and wireless speaker sets are currently in high demand. Studies by marketing and research agencies suggest that this trend is to continue into the foreseeable future. When comparing B&O's product range to what analysts believe the consumers in the market are demanding, B&O seems to have achieved a rather good product-market fit. I expect B&O to be able to capitalize on this and this has been reflected in my forecast of the sales of this business unit in the 7 years to come.

I reckon the Speaker segment will increase its sales by 15% in FY2016/17, 12% in FY2017/18, 11% in FY2018/19, 10% in FY2019/20, 9% in FY2020/21 and 7% in FY2021/22 before eventually flattening out. I base these assumptions on the strategic analysis of the Speaker product line, where I also present graphs that forecast the market growth (see Section 3.2.3.2). Achieving these positive sales

growth rates seems more than reasonable given B&O's product line and the expected growth of the soundbar and wireless speaker markets in the near future.

5.2.3.1.1.5 Licensing revenue from Automotive

Based on the analysis of the Automotive business in the chapter of strategic analyses, I will argue that the future licensing revenue from the Automotive deal will be of significant importance to B&O and that strong growth rates can be expected over the years in the foreseeable future. In the strategic analysis, this business unit has been classified as a Star because of the positive outlook. Though, assessing by how much it will actually grow is hard, as there is no precedent to base the forecasting upon. B&O has stated that it expects to receive 136.7 million DKK in the first year of the deal with HARMAN. This is stated on page 52 in the most recent annual report and, as a note, B&O states that this number has been booked as "deferred income classified as non-current liabilities constitute revenue related to the license agreement with HARMAN." Thus, I will use this as a base for the forecast of future revenue from this deal.

Figure 3.5 shows the sales of the top 10 premium audio brands from 2010 to 2013 (as analyzed by IHS). The figure shows that sales have been quite steadily increasing over the 4-year period. The annual growth rate during these four years has been roughly equal to 17%. Given that only more options have become available since then – as BOSE, JBL and others have increased their market positions and B&O (via HARMAN) has launched more deals with other car brands, the total market is increasing – I will argue that this rate of growth is likely to continue in the foreseeable future.

As it is hard to find reasonable and accurate forecasts on the total growth of the branded car audio market, it is hard to determine when this growth is likely to flatten out. Also, assessing whether B&O will be able to grow its sales simply by following the market or, in addition, also by actively taking market shares is similarly difficult. Though, I believe that the sales records of the industry of the past serve as evidence of the fact that this is indeed a rapidly expanding segment. I forecast the licensing revenue of from the Automotive segment to be increasing and that B&O will – at least – be able to follow the market and possible also increase its market share. I will use the 17% annual growth rate observed in the industry between 2010 and 2013 as a guide for the growth that B&O is to experience in the revenue of this segment.

When the deal with HARMAN was signed, it was expected that the deal would net B&O approx. 3 billion DKK over a 20-year period (Bang & Olufsen, 2015, p. 3). In my forecast, I reckon that B&O will earn approx. 2 billion DKK from the deal over the first 8 years. I believe this to be reasonable,

as the market is expanding very rapidly right now. Once the market settles, I believe the growth to slow down. Thus, I forecast that B&O will net the most of this deal in the first half of the deal's life.

5.2.3.1.1.6 Summary of sales forecast

Based on the analysis and forecast of the sales (in million DKK) of each business unit/product line, I expect the total sales of B&O to grow as stated in Table 5.2 over the next 7 years.

FY	2015	2016	2017	2018	2019	2020	2021	2022	Ter.p.
B&O PLAY	970.2	1,358	2,037	3,259	4,237	5,084	5,593	5,872	
Growth	58%	40%	50%	60%	30%	20%	10%	5%	
TVs	847	889	978	1125	1,237	1,386	1524	1601	
Growth	-22%	5%	10%	15%	10%	12%	10%	5%	
Audio	105.3	83.16	65.66	51.84	40.93	32.31	25.51	20.14	
Growth	-11%	-21%	-21%	-21%	-21%	-21%	-21%	-21%	
Speak-ers	500.3	575.4	644.4	715.3	786.9	857.7	917.7	945.3	
Growth	18%	15%	12%	11%	10%	9%	7%	3%	
Auto-motive	136.7	159.88	187.0	218.72	255.81	299.20	349.95	409.30	
Growth		17%	17%	17%	17%	17%	17%	17%	
Others	210.7	204.37	260.8	357.99	437.19	510.62	560.68	589.84	
Growth	8%	7%	7%	7%	7%	7%	7%	7%	
Total sales	2,356	2,633	3,065	3,912	5,370	7,659	8,410	8,847	9,072
Growth		16.4%	27.6%	37.3%	22.2%	16.80%	9.80%	5.20%	2.54%

Table 5.2 Forecasted sales growth over the next 7 financial years

5.2.3.1.2 Gross margin

In my forecast of the gross margin of B&O in the high-growth period and in the mature period, respectively, I will assume the following:

- B&O has stated that the saving capacity costs in relation to LG's agreement is equal to 150-200 mDKK annually when fully implemented, which it will be over the next three years (Bang & Olufsen, 2016). Being optimistic about B&O's future, I reckon that the cost savings will be 200 mDKK in total and that the effect will be spread gradually over the three-year period.
- In the first three years of the forecasting, production costs have been estimated using the average production costs/sales revenue ratio for the years FY2011/12, FY2012/13, FY2013/14 and FY 2015/16, which value was 61.55%. FY2014/15 has not been included because, as a result of the Automotive transaction, B&O's production costs/sales increased significantly

(75%) and, thus, including it would have biased the average value. I estimated the production costs for FY2016/17, FY2017/18 and FY2018/19 by multiplying sales with the average ratio (61.55%) and subsequently I subtracted the corresponding cost savings from the LG deal. For the remaining years of the forecast, I assume that the production costs/sales revenue ratio will be equal to 57.8% (the value in FY2018/19, which is the year in where the cost saving has reached its full effect).

Following these assumptions, I have reached the corresponding gross margin values:

Financial year	2016	2017	2018	2019	2020	2021	2022	Term.p.
Gross margin	40.6%	41.9%	42.2%	42.2%	42.2%	42.2%	42.2%	42.2%

Table 5.3 Forecasted Gross Margins

For more details about the gross margin calculation, see Appendix 15: Forecasted gross margin.

5.2.3.1.3 Research and development costs

B&O has stated that it will continue to increase the use of technology and sourcing partnership in areas where the group can benefit from the partners' economy of scale (Bang & Olufsen, 2016, p. 32). Therefore, it is reasonable to assume, that the R&D/sales ratio will decline over the forecasting period. I reckon that the ratio will gradually decrease during the high-growth period from its value in FY2015/16 (12%) to the lowest value it reached over the last five financial years (11.2%[15]).

Financial year	2016	2017	2018	2019	2020	2021	2022	Term.p.
R&D/sales	11.86%	11.77%	11.67%	11.58%	11.48%	11.39%	11.29%	11.20%

Table 5.4 Forecasted R&D/Sales ratio

5.2.3.1.4 Distribution and marketing costs

B&O will continue to close non-performing B1 stores while also increase the number of third-party retail stores (Bang & Olufsen, 2016, pp. 15-16). Thus, I have forecasted that the distribution and marketing cots/sales ratio will decrease throughout the high-growth period from 28.1% (the value in FY2015/16) to 21.8%, the lowest value over the last five financial years.

Financial year	2016	2017	2018	2019	2020	2021	2022	Term.p.
Distr. & mark./sales	27.3%	26.5%	25.7%	24.9%	24.1%	23.3%	22.5%	21.8%

Table 5.5 Forecasted Distribution and Marketing costs/Sales ratio

5.2.3.1.5 Administration costs

I have estimated that the administration costs/sales forecasted values will be equal to the historical four-year average (3.2%[15]). I decided to not include FY2015/16 in the computation because, as a consequence of Tue Mantoni's severance payment (15.6 million DKK) and restructuring costs (16

[15] For more details about the calculation, please refer to Appendix 16: Capacity costs FY2011/12-FY2015/16

million DKK), the ratio reached the highest value over the last five years (4%). Including it would bias the average value.

Financial year	2016	2017	2018	2019	2020	2021	2022	Term.per.
Adm. costs/sales	3.2%	3.2%	3.2%	3.2%	3.2%	3.2%	3.2%	3.2%

Table 5.6 Forecasted Administration costs/Sales

5.2.3.1.6 Interest rate

I assume that the interest rate for the forecasting period will be the five-year historical average (4.8%).

Financial year	2011/12	2012/13	2013/14	2014/15	2015/16	Average
Interest expense	16.6	19.6	18.4	16.8	10.9	
Mortgage and loans	369.5	362.9	426.00	409.50	189.60	
Interest rate	4.5%	5.4%	4.3%	4.1%	5.7%	4.8%

Table 5.7 Forecasted Interest Rate

5.2.3.1.7 Tax rate

One has two choices in regards to tax rates: (1) To either use the marginal tax rate, which is the tax rate that depends on the tax code and reflects what firms have to pay in taxes on their marginal income (Damodaran, 2016), or (2) to use the effective tax rate, which is the tax rate computed from the company's income statement.

Financial year	2011/12	2012/13	2013/14	2014/15	2015/16
Effective tax rate	29.7%	24.5%	20.5%	24.3%	18.1%
Danish marginal tax rate[16]	25%	25%	25%	24.5%	23.5%

Table 5.8 Effective vs. marginal tax rate from FY 2011/12 to FY2015/16

There are many reasons why the effective and the marginal tax rate can deviate: The use of different accounting standards, the use of tax credits to reduce taxes or the use of deferred taxes. In valuation, using marginal tax rates is safer as none of the reasons for differing effective and marginal tax rates hold forever (Damodaran, 2016). Therefore, I will use the marginal tax rate of 2015: 23.5%.

5.2.3.2 *Value drivers: pro-forma balance sheet*

In this section I will study the value drivers that are needed for the pro-forma balance sheet.

5.2.3.2.1 Non-current assets/sales

The non-current assets/sales ratio has ranged between 25.3% and 40.3% over the last five financial years. The values for FY2014/15 and FY2015/16 were the lowest due to the sale of the Automotive and ICEpower business units, which reduced B&O's non-current assets. In FY2016/17, B&O's non-

[16] Extracted from: http://pages.stern.nyu.edu/~adamodar/New_Home_Page/datafile/countrytaxrate.htm

current assets are expected to continue reducing because, as a consequence of the newly launched strategic technology partnership with LG, B&O will incur higher depreciations on the current TV product portfolio as well as lower capitalizations (Bang & Olufsen, 2016, p. 33). I have assumed that the ratio will decrease to 20% in FY2016/17 and that it will increase gradually to the level it had in FY2015/16 (25.3%), as this is the year that represents better B&O's new business strategy.

Financial year	2016	2017	2018	2019	2020	2021	2022	Term. period
Non-current assets/sales	20.00 %	20.7%	21.5%	22.2%	23.0%	23.7%	24.5%	25.3%

Table 5.9 Forecasted Non-current assets/Sales

5.2.3.2.2 Working capital/sales

For the current assets/sales ratio and operating liabilities/sales ratio, I assume that both will be equal to their average over the last five financial years: 56.2% and 35.3%, respectively.

Financial year	2011	2012	2013	2014	2015	5-year average
Current assets/sales	48%	60%	71%	55%	47%	56.2%
Operating liabilities/sales	29%	30%	37%	47%	35%	35.3%

Table 5.10 Forecasted Working capital/Sales

5.2.3.2.3 NIBD/invested capital

As a consequence of the divestment of the B2B business, the NIBD/invested capital ratio was negative in FY2014/15 (-108%) and in FY2015/16 (-75%). As these values are not representative of B&O's regular operations, I assume that, in the high-growth period, the ratio will be equal to the average value of FY2011/12, FY2012/13 and FY2013/14, which was 11%. Furthermore, I assume that the ratio in the terminal period will be 11%, too, despite the fact that high growth firms tend to use less debt than mature companies (Damodaran, 2002, p. 436). I made this assumption, as there is no official statement about the management's view on debt that I can rely on and, also, because in the financial years where the NIBD/invested capital could have been higher (B&O's best years, from 2005 to 2007), the average value was equal was equal to 11.56%[17].

Financial year	2016	2017	2018	2019	2020	2021	2022	Term. Peri.
NIBD / invested capital	11.0%	11.0%	11.0%	11.0%	11.0%	11.0%	11.0%	11.0%

Table 5.11 Forecasted NIBD/invested capital

5.2.4 Calculated NOPAT and invested capital values

Combining all the previous findings has led me to estimate the following NOPAT and invested capital values. During the first year, NOPAT will be assumed to be negative but soon it will reach a positive

[17] For further details about the calculation please refer to Appendix 17: Interest bearing debt/total assets

value, increasing steadily over the forecasted period, as sales will keep growing and the ratios *R&D/sales*, *marketing and distribution costs/sales* and *production costs/sales* decrease. In regards to invested capital, it will continue to grow over the forecasted period at a faster rate than sales, due to assumed increasing non-current assets/sales.

Financial year	2016	2017	2018	2019	2020	2021	2022	Ter.p.
NOPAT	-41.45	10.59	63.99	122.69	195.31	271.58	345.79	416.17
Invest. cap.	983	1,284	1,803	2,251	2,687	3,013	3,236	3,386

Table 5.12 Forecasted NOPAT and invested capital

5.2.5 Calculation of the weighted average cost of capital

In this section I will calculate the weighted average cost of capital (WACC), which I will later use to discount the different EVA values. The WACC is calculated so (Petersen & Plenborg, 2012, p. 246):

$$WACC = \frac{NIBD}{(NIBD + Equity)} * r_d * (1 - \tau) + \frac{Equity}{(NIBD + Equity)} * r_e$$

where $r_d * (1 - \tau)$ represents the cost of debt after tax, r_e is the cost of equity, $\frac{NIBD}{(NIBD+Equity)}$ is the debt/asset ratio and the $\frac{Equity}{(NIBD+Equity)}$ is the equity/asset ratio. Next, I will calculate the values for each of the different input variables for both the high-growth period and the mature period.

5.2.5.1 *Cost of equity*

This section will start with an introduction presenting an overview of the main models that can be used to estimate the cost of equity, emphasizing mostly on the CAPM model. Then, I will proceed to estimate the inputs necessary for the CAPM model to finally arrive at the estimated cost of equity.

The cost of equity (r_e) represents the rate of return that investors require on an equity investment (Damodaran, 2002, p. 248). There are three ways in which the cost of equity can be estimated (Damodaran, 2002, p. 218): CAPM (capital asset pricing model), arbitrage pricing models (APM) and multi-factor models. All of these models define the risk in terms of variance of actual returns compare to expected returns and, also, defend that the risk has to be measured from the perspective of a well-diversified marginal investor. This means that only the risk that a new investment adds to the diversified portfolio is the one that should be rewarded and compensated.

While having some similarities, these models have also differences that mainly relate to the way the beta is calculated. The CAPM model calculates the beta against its market portfolio while the APM

estimates the beta against multiple (unspecified) market risk factors. The multi-factor model measures the beta against multiple specified macro-economic factors. I have decided to use the CAPM model to estimate the cost of equity, as "much progress has been made in the development of richer asset-pricing models. As of yet, however, none of these more sophisticated models has proved clearly superior to CAPM" (Mullins, 1982). The CAPM model holds the following assumptions (Damodaran, 2002, pp. 95-99):

- There are no transactions costs. All assets are traded and investments are infinitely divisible.
- Everyone has access to the same information and the market has no risk of insider trading.
- All investors hold combinations of the risk-free (e.g., stable government bonds) and risky assets (e.g., stocks) depending on individual risk preferences.
- The risk of an asset depends on the extra risk it adds to the market portfolio, which is measured by the covariance of the asset with the market portfolio. The covariance alone is difficult to interpret so the value is standardized by dividing the covariance of each asset with the variance of the market portfolio, yielding the beta (β) of the asset.

Given the following assumptions, the CAPM model estimates the expected return of equity as:

$$E(r_e) = r_f + \beta_e * E(r_m - r_f)$$

where r_e is the investor's required rate of return, r_f is the risk-free rate, β_e is the beta of the equity asset and $E(r_m - r_f)$ is the market risk premium.

5.2.5.1.1 Estimating the beta value

Following Damodaran's recommendation, I will calculate two beta values: one for the high-growth period and another for the terminal period. Damodaran argues that, as high growth firms are usually more exposed to market risk, they should have higher beta values. On the other hand, as companies grow more steadily, their betas tend to be closer to 1. This is due to the fact that companies tend to increase their size over time resulting in a situation where they become more diversified and have more assets producing cash flows. This ultimately leads to reducing its exposure to market risk (Damodaran, 2002, p. 435).

Damodaran presents different ways to estimate the beta value of a company and I will explain three of them in relation to B&O: (1) Estimating the beta via regression, (2) modifying the calculated regression beta (e.g., using the Marshall Blume approach) and (3) using the bottom-up approach.

5.2.5.1.1.1 Estimating beta via regression

The beta is a relative risk measure that is usually estimated by a regression between the historical returns of the equity asset and the historical returns on a market index (Damodaran, 2002, p. 249). The slope of this regression is the beta (β). The beta will depend upon the data period (e.g., 1, 2 or 5 years), the chosen market index (e.g., S&P500, NASDAQ OMX C20 or MSCI World Index) and the return interval (e.g., daily, weekly or annual). Regression betas are a noisy estimate, as they provide a statistical answer (which comes with a standard error) to what is the beta of a company. To prove this, I made six different regressions with B&O's stock returns against the MSCI World Index, S&P500 and the NASDAQ OMX C20, which provide the beta estimates seen in Table 5.13.

	1 year			2 years			5 years		
Index	MSCI	SP500	C20	MSCI	SP500	C20	MSCI	SP500	C20
Weekly	1.12	1.08	1.16	0.87	0.59	0.97	1.04	0.85	0.98
Monthly	1.35	1.22	1.23	0.72	0.55	2.57	0.70	0.42	1.66

Table 5.13 Regression betas

The results vary quite significantly from 0.42 to 2.57 – depending on the market index, data period and the return interval. Using the regression technique to estimate the beta has several drawbacks: In practice, indices, such as S&P500, only include equity securities and do not include other asset classes, as these are usually not reported on a weekly or monthly basis (Damodaran, 2002, p. 7).

By going back in time, there is an advantage of having more observations in the regression. However, by doing this, the fact that the company may have experienced some changes in terms of business mix, leverage and operating cost structures over the period will not be taken into consideration. In the case of companies, which have been recently restructured, acquired or divested, or companies, which have experienced a change in its leverage, it is recommendable to use a shorter estimation period (Damodaran, 2002, p. 9). Moreover, for low-volume traded assets, using daily or weekly returns, can reduce the measured correlation with the market index and, consequently, affect the beta estimate (Damodaran, 2002, p. 10). To reduce this problem, one can use longer return intervals, such as monthly or annual. The B&O stock is indeed a low-traded equity asset: Throughout the past 12 months B&O had an average daily trading volume of 141,152[18], which was significantly lower to the average trading volume of the OMX C20 market index, which is regularly above 10 million[18].

[18] Extracted from Yahoo Finance.

It seems that the best beta estimate comes from the 1-year monthly MSCI World Index regression that presents beta value of 1.35[19]. This is due to several reasons. First, as B&O is a low-traded asset, using monthly returns for the regression reduces the bias problem. Second, over the last year, B&O has been under significantly changes in terms of business mix and operating cost structure and, thus, having last year as a time frame better reflects B&O's current situation. Finally, B&O is a company that operates internationally and, thus, a regression towards the MSCI World Index represents a better estimation of B&O's relationship with market risk, as it includes stocks from all over the world.

5.2.5.1.1.2 Modifying regression betas

In order to modify the regression beta to better reflect the firm's current operating and financial characteristics, a requirement is that the initial beta estimate has to be reasonably good, which is difficult taking into consideration what I have explained in the previous section. Estimating services (e.g., Reuters, Bloomberg, MSN Finance and others) generally modify the betas. For example, Bloomberg shrinks all betas towards one by using the smoothing process model from Marshall Blume who argues that estimated beta coefficients tend to regress towards the grand mean of all betas over time (Blume, 1975, p. 794). Though, according to Damodaran, this method does not make much sense, as the speed at which betas converge to one should depend on each individual company (Damodaran, 2002, p. 12).

5.2.5.1.1.3 Bottom-up approach

Under the bottom-up approach, the beta of a company is not estimated through past prices of the company. Rather, the approach depends on the kind of business the company is involved in, the company's cost structure and the degree of financial leverage. The levered beta is determined by the company's current financial degree $\frac{D}{E}$, the tax rate (τ) and the unlevered beta (β_u), which is computed by averaging the regression betas of different firms (e.g., competitors) within the company's industry:

$$\beta_l = \beta_u \left(1 + (1 - \tau)\frac{D}{E}\right)$$

where $\beta_u = \frac{1}{n}\sum_{i=1}^{n} \widehat{\beta_i}$ and $\widehat{\beta_i}$ is the regression beta of company *i* in the industry.

The formula is founded upon the following reasoning: The more sensitive an industry is to market conditions; the higher the company's beta should be. Also, a company with a high degree of operating leverage should have a higher beta, as it has less flexibility to react to economic downturns. Both the industry and operating leverage risk are reflected in the formula by β_u. Finally, a company with high

[19] For further details about the regression please check Appendix 18: Estimating beta via regression.

financial leverage, represented in the formula by $\frac{D}{E}$, should have a higher beta, as the variance over the net income is higher. This approach provides better estimates than the regression beta approach (Damodaran, 2002, p. 22): By averaging the regression betas, the noise of the regression betas is reduced. Also, the levered beta is computed using the current financial leverage of the company rather than the average leverage over the period of the regression. This argument led me to use the bottom-up approach for calculating B&O's beta.

It should be noted that the formula for computing the levered beta could be extended by subtracting the following term from β_l, which describes the market risk of the debt:

$$\beta_d(1 - \tau)\frac{D}{E}$$

However, since B&O has a low debt ratio, I assume β_d to be equal to 0 (Damodaran, 2002, p. 266).

5.2.5.1.1.4 Calculating B&O's beta

Having the decided upon the method for calculating B&O's beta, the different required inputs must be calculated in order to compute the final beta. I will start by computing the unlevered beta. Then I will assume the tax rate and, afterwards, the D/E ratio. I will use net interest bearing debt over equity ($\frac{NIBD}{E}$) as a substitute for D/E in the formula. To compute B&O's beta I will follow these steps:

1. Identify the business in which B&O operates in.
2. Estimate the global average unlevered beta value for B&O's industry.
3. Calculate the leverage ratio and the tax rate for B&O.

According to a classification made by Damodaran, B&O is in the "Electronics (Consumer & Office)" industry. As of January 2016, 153 companies were listed in this category including well-known brands such as Sharp, Sony, LG, Hisense and Panasonic.[20] Moreover, Damodaran has computed the average unlevered beta for the companies in this industry to be 0.96[21] as of January 2016. In my calculation of B&O's levered beta, I will be using this number as my base.

[20] For a complete overview of all of the companies listed in the Electronics (Consumer & Office) category, please refer to the following link: http://www.stern.nyu.edu/~adamodar/pc/datasets/indname.xls
[21] Extracted from: http://www.stern.nyu.edu/~adamodar/pc/datasets/totalbetaGlobal.xls

As explained in Section 5.2.3.1.6, the tax rate to which B&O is subject has been decreasing over the past few years and currently the tax rate in Denmark for companies of B&O's nature is 23.5%. This will serve as the second input in the computation of the levered beta.

To find a value for the D/E ratio, I will use the $\frac{NIBD}{E}$ ratio as a substitute. The net interest bearing debt discounts liquid assets (such as a cash) from the actual debt and, since B&O still possesses a lot of cash from its sales of the ICEpower and Automative businesses (788.5 mDKK in the latest financial report), its current $\frac{NIBD}{E}$ ratio is negative. B&O is arguably in a special situation regarding its cash holdings because of these recent sales and therefore I will disregard the reported $\frac{NIBD}{E}$ ratios of the past two financial reports. Rather, for my calculation of B&O's beta, I will use an average of the $\frac{NIBD}{E}$ ratios reported in the financial reports for FY2011/12, FY2012/13 and FY2013/14, which were all before the event of the sales. The $\frac{NIBD}{E}$ ratio for FY2011/12 was 9.37%. In FY2012/13 it was 11.08% and in FY2013/14 it was 17.40%. An average of these results in 12.62%. I will be using this number and replace the D/E component of the formula for the levered beta with this.

Thus, using the β_u of 0.96, the tax ratio of 23.5% and the D/E value of 12.62%, I can compute B&O's levered beta to be equal to 1.053. This value is low given B&O's high degree of operating leverage.

Financial year	2015/16	2014/15	2013/14	2012/13	2011/12
EBIT	-202.2	-807	-260.6	-188.2	122.4
Sales revenue	2633.4	2356.5	2161.7	2,180.7	3,007.7
Degree of Operating Leverage[22]	6.38	23.27	44.15	9.23	

Table 5.14 Degrees of Operating Leverage during the past 5 years

While the beta value is low given its high degree of operating leverage, it makes sense that beta value is not higher than it is, as companies that have a high operating risk (like B&O) tend to minimize its financial risk to compensate for the high operating leverage (Petersen & Plenborg, 2012, p. 261). B&O had an average D/E ratio of 12.62% compared to the D/E ratio of the industry, which was 37.99%[23]. This is indirectly a sign that B&O has a higher operating risk than the rest of the industry and, thus, attempts to compensate for this by lowering its financial risk (e.g., by paying off debt).

[22] $Degree\ of\ operating\ leverage = \frac{\%\ change\ in\ EBIT}{\%\ change\ in\ sales}$ (Damodaran, 2002, p. 265).

[23] Extracted from: http://www.stern.nyu.edu/~adamodar/pc/datasets/waccGlobal.xls

If one were to compute the levered beta for B&O using the average D/E ratio of the industry, the result would be 1.24, which is obviously more in line with the overall beta for the industry. The average beta of the industry is 1.29 – thus, the only difference that leads B&O to having a lower beta in this case is the Danish tax rate of 23.5%, which seems to be higher than the average for the industry (resulting in a lower beta). In lack of a better proxy for a justifiable D/E ratio for B&O I will assume its beta in the mature phase to be equal to 1.24. I believe that this is a better estimate than the alternative, which would be to assume the mature beta to be 1. According to Damodaran, when valuating companies, one can justify selecting a level for the beta in the mature phase that reflects the overall volatility of the industry. As explained the strategic analysis, the consumer electronics industry is arguably quite volatile and, thus, I believe 1.24 to be a fair reflection of B&O's beta in this market.

$$\beta_{mature} = 0.96 * (1 + (1 - 0.235) * 0.3799) = 1.24$$

For determining B&O's beta in the high-growth period, I will use a different approach. As I have explained in previous analyses in Chapters 3 and 4, B&O's situation is quite different from its competitors and, thus, it does not seem fair to assume a beta so close to (and even lower than) that of the other companies in the same category. Because B&O is arguably compensating for its high operating risk by lowering its financial risk, Damodaran's bottom-up approach for computing the levered beta does not seem to be the best for determining its beta during the short term (while the company is growing a lot). Thus, in my calculation of B&O's weighted average cost of capital in the high-growth period, I will be using an average of the beta for B&O provided by Reuters, MSN Finance and the most reasonable beta provided by regression (MSCI ACWI World Index, 1 year, monthly). The average of these three values is 1.62, which is the beta I will be assuming during the high-growth period.

Average beta	1.62
Reuters	1.920
MSN Finance	1.580
MSCI ACWI World, 1 year, monthly	1.355

Table 5.15 Beta in the high-growth period

In conclusion, I will assume a beta of 1.62 during the upcoming 7 years (the length of B&O's high-growth period) and a beta of 1.24 subsequently (when B&O has matured).

5.2.5.1.2 Risk-free rate

For an investment to be risk-free, the entity issuing the security has to have no default risk and the security cannot bear reinvestment risk. The logic tells us that securities issued by governments should

have no default risk. However, not all governments are risk-free. Examples of recent history include the cases of Argentina, Greece and Iceland.

In valuation where the time horizon is infinite, it will be tempting to use the longest time-horizon bond that the government issues, which is generally 30 years. Though, while it is better in avoiding the reinvestment risk, it also suffers from illiquidity which affects the yields (Petersen & Plenborg, 2012, p. 251). In order to avoid this problem, I will use the 10-year government bond rate.

During 2016, numerous Danish interest rates for different government bonds have achieved negative values. Damodaran has analyzed this issue and he has found out that the expected return of equity has been relatively stable over the last 15 years – despite the decreasing returns of the risk-free rate, as the equity risk-premiums have gone up to compensate (Damodaran, 2016, p. 13). Therefore, as the equity risk premium is adjusted (upwards) to reflect the effect of a low interest rate, I have decided to use the yield of the 10-year Danish government bond as of the 1st of November 2016, which was equal to 0.232%. I have chosen the Danish government bond because it is a virtually risk-free asset, as Moody's gave the Danish government a rating of Aaa (Damodaran, 2016). By selecting a security that is issued in DKK, I also have prevented issues with regards to inflation (Petersen & Plenborg, 2012, p. 251).

5.2.5.1.3 Market risk premium

The expected market risk premium $E(r_m - r_f)$ is the premium that investors charge for investing in the average equity and is typically computed in two ways (Petersen & Plenborg, 2012, p. 263):

- Using the ex-post approach or
- Using the ex-ante approach.

The ex-post approach examines the average difference between historical returns on the stock market (e.g., an index reflecting the market) and the risk-free rates and is based on the assumption that the historical risk premium is a reasonable indicator of the future market portfolio's risk premium (Petersen & Plenborg, 2012, p. 263). The estimations will differ on the time frame, on the risk-free asset and whether arithmetic or geometric averages have used for the estimation (Damodaran, 2002, pp. 222-223). The ex-post approach provides noisy estimates, which can have substantial residual errors and also assumes that the average risk investment has remained stable over the period examined – i.e., that investors' risk aversion has not changed in a systematic way over the period. It also presents a survivorship bias, which increases the value for the equity risk premium.

On the other hand, the ex-ante approach is forward-looking and dynamic, as it attempts to infer the market portfolios implicit risk premium. This is the method that Damodaran defends and, given the current literature on the subject, this seems to be the most reasonable approach. Under the ex-ante approach, one could calculate the implied equity risk premium for a developed country, like the U.S., using a well-established index (such as the S&P 500 index). Subsequently, one can estimate the default spread for the specific country in question. Of course, this is only to be done if the implied equity risk premium is computed for another country with a different risk profile than the country of the index. Adjusting for a specific country (different from the one the index is based upon) could be done in one of two ways: Either by using the local currency sovereign rating for the country from a trusted rating agency or by using the CDS spread for the corresponding country. In the case of Denmark, I will use the American implied equity risk premium, which was 6.26%[24] on the 1st of November 2016. I will then add the default spread, which in this case is effectively equal to 0%, as both the U.S. and Denmark have Aaa ratings according to Moody's. Therefore, the market risk premium for Denmark will be equal to 6.26%.

5.2.5.1.4 Result of computing the cost of equity

Given all the inputs that I have estimated, this leads to the following cost of equity estimations:

Cost of equity for the high-growth period	Cost of equity for the terminal period
$r_e = 0.232\% + 1.62 * 6.26\% = 10.36\%$	$r_e = 0.232\% + 1.24 * 6.26\% = 7.99\%$

Table 5.16 Cost of equity estimations for B&O in the high-growth and terminal period

As expected, the required return for the high-growth period is higher than the one of the terminal period showing that, during the high-growth period, B&O has a higher degree of uncertainty. As a result, investors will require a higher return to compensate for that risk. The required return on equity for the terminal period is estimated to be 7.99%, which is in line with what could be expected, as the average expected return on equity for the American stocks (a mature economy) from 2008 until 2016 has remained stable with an average value equal to 8.23%[24] (see Figure 5.1). This is true despite the fall of interest rates, according to Damodaran. It makes sense that, when B&O becomes mature, the required return on equity by investors is close to the expected required return for the equity asset class in a mature economy with no country risk (as B&O is in Denmark).

[24] Extracted and computed from: http://www.stern.nyu.edu/~adamodar/pc/implprem/ERPbymonth.xls

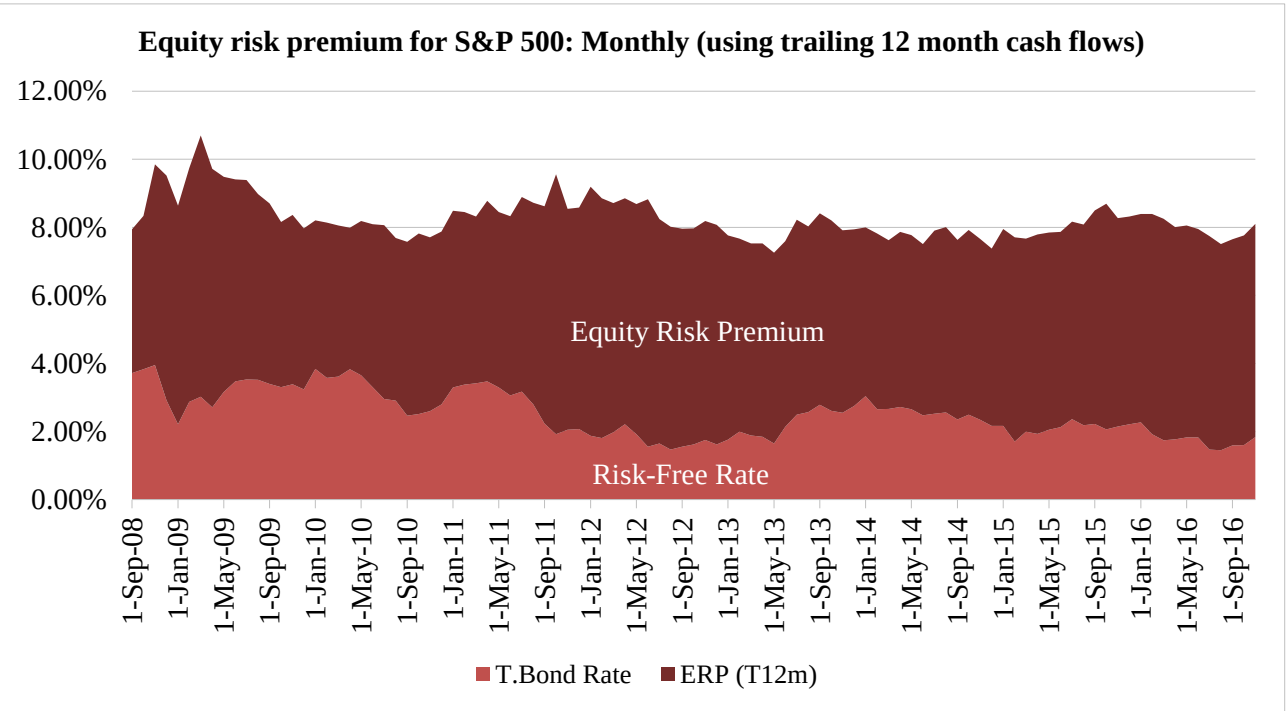


Figure 5.1 Chart of the equity risk premium for the S&P500 over an 8-year period (Damodaran, 2016)

5.2.5.2 *Cost of debt*

The cost of debt measures the cost to the company to borrow funds. It is the expected return that lenders hope to make on their investments, which depends upon the default risk of the corresponding company. There are several ways for calculating the cost of debt (Damodaran, 2002, pp. 285-286):

- If the company has outstanding trading bonds, the yield of the bonds can a good proxy.
- If it does not have outstanding trading bonds, yet is rated by an agency rating, it is possible to estimate the cost of debt by adding the corresponding default spread to the risk-free rate.
- When none of the above cases apply – which is the case of B&O – there are two ways to estimate the cost of debt. One could either:
    - (1) use the most recent borrowing history or
    - (2) estimate a synthetic rating by calculating the interest coverage ratios.
- Since the interest coverage ratio (EBIT/interest expense) has been negative in the last four years in B&O's case – and, thus, it would not estimate a realistic cost of debt for B&O – I will go with the first approach.

FY	2011/12	2012/13	2013/14	2014/15	2015/16	Average
Interest expense	16.6	19.6	18.4	16.8	10.9	
Mortgage and loans	369.5	362.9	426.00	409.50	189.60	
Interest rate	4.5%	5.4%	4.3%	4.1%	5.7%	4.8%

Table 5.17 Borrowing history

I will assume that the cost of debt for the high-growth period will be equal to 4.8%, which was the average value for the last five financial years. I will assume that the cost of debt will be lower in the terminal period, as increasing its earnings and cashflows, its perceived inherent risk will decrease when a company reaches its mature state. Therefore, it is logical to set a cost of debt in the terminal period to be lower than in the high-growth stage. Damodaran suggests to set the cost of debt equal to the average one of the industry for the terminal period (Damodaran, 2002, p. 437), which in the case of B&O's industry is 4.38%[25] for European companies.

The tax rate that I will use to estimate the cost of debt will be the marginal tax rate, which in the case of Denmark is 23.5%. With all of the above inputs, the after-tax cost of debt for each of the two periods can be calculated as it has been done in Table 5.18.

Cost of debt in the high-growth period	Cost of debt in the terminal period
$r_d = 4.8\% * (1 - 23.5\%) = 3.68\%$	$r_d = 4.38\% * (1 - 23.5\%) = 3.35\%$

Table 5.18 Cost of debt in the high-growth and terminal period

5.2.5.3 *Capital structure*

The average $\frac{NIBD}{(NIBD+Equity)}$ ratio over the last five financial years has been 11%, which is the value I assume for the the high-growth and terminal period. This is in line with what I argued in section 5.2.3.2.3. Thus, I assume that the $\frac{Equity}{(NIBD+Equity)}$ ratio for both the high-growth period and for the terminal period will be equal to 89%.

5.2.5.4 *Final WACC calculations*

The WACC for the high-growth period is higher than the one of the terminal period with a difference of 2.15 percentage points. These two numbers come close to what two sell-side analysts that cover the B&O stock have used for their valuations: Morten Imsgard, financial analyst at Sydbank, used a WACC of 8.1% for his valuation of B&O (Sydbank, 2016) while Kristian Godiksen, financial analyst at SEB, used a WACC of 10% due to "the elevated risk and low visibility into account" (please see Appendix 19: Email correspondence with financial analyst from SEB). Please see Table 5.19.

[25] Extracted from: http://www.stern.nyu.edu/~adamodar/pc/datasets/waccEurope.xls

WACC in the high-growth period	WACC in the terminal period
$WACC = 11\% * 3.68\% + (89\%) * 10.36\% = 9.63\%$	$WACC = 11\% * 3.35\% + (89\%) * 7.99\% = 7.48\%$

Table 5.19 WACC in the high-growth and terminal period

I assume a WACC of 9.63% in the high-growth period and a WACC of 7.48% in the terminal period.

5.3 Estimation of B&O's stock price

Given all the assumed inputs, the EVA model can be applied to compute the estimated stock price of B&O. Table 5.20 shows the computations of the EVA model and, as it can be seen at the bottom line, I estimate that the value of B&O's stock price should be **83.22 DKK** on the 1st of November, 2016.

Stable growth rate = 2.54%	High-growth period							Terminal period
	2016	2017	2018	2019	2020	2021	2022	2023
NOPAT	(41.45)	10.59	63.99	122.69	195.31	271.6	345.8	416.17
WACC*inv.c.	94.63	94.68	123.64	173.59	216.73	258.7	290.1	242.20
WACC	9.63%	9.63%	9.63%	9.63%	9.63%	9.63%	9.63%	7.48%
EVA	(136.09)	(84.09)	(59.65)	(50.90)	(21.41)	12.92	55.70	173.98
Discounted value	(124.14)	(69.97)	(45.28)	(35.24)	(13.52)	7.45	29.27	2,121.34
Sum of PV	1,869.91							
Inv. capital, t_0	983.0							
Net interest bearing debt	-742.00							
Equity value in mDKK	3,594.91							
# of shares	43,197,478							
Share price	83.22							

Table 5.20 Calculation of B&O's equity value and share price

As Table 5.20 shows, the Economic Value Added is estimated to be negative over the next five years. This is a direct consequence of the forecasts of the net operating profit after tax (NOPAT) and the invested capital as explained in Section 5.2.4. Naturally, as B&O's sales will increase, so will its invested capital and it is not until FY2021/22 that NOPAT is forecasted to have grown at a quicker rate than the cost of the invested capital in order to produce a positive EVA value. The large, positive EVA value of the terminal period is therefore compensating for the negative EVA values of the first five years. This leads to the interpretation that it is key for B&O to keep up its growth rates during the high-growth period in order to make the business healthy and profitable before entering into its mature period.

In order to see that the forecasted pro-forma income statement and balance sheet are indeed realistic and serve as a good foundation for the valuation, I calculated different profitability ratios (ROIC and the EBIT margin) for the forecasted years, as it can be seen in Table 5.21 below:

Financial year	2016	2017	2018	2019	2020	2021	2022	Term.per.
EBIT Margin	-1.72%	0.41%	1.61%	2.50%	3.39%	4.28%	5.17%	6.06%
ROIC after tax	-4.2%	0.8%	3.5%	5.4%	7.3%	9.0%	10.7%	12.3%

Table 5.21 Forecasted profitability ratios

The ROIC value is negative in the first year (-4.2%) as expected but from the subsequent year and onwards the ratio increases up to a value of 12.3% in the terminal period. This is close to the 2015 average ROIC value estimated by Damodaran of the 17 European companies in the "Electronics (Consumer & Office)" industry, which was 10.79%[26]. Thus, it is a plausible estimate that B&O in the terminal period will yield the forecasted ROIC value. Furthermore, the EBIT margin is negative in the first forecasted year with a value of -1.72% but, as with the ROIC, the value goes up during the forecasted period until it reaches a value of 6.06% in the terminal period. B&O's financial strategy target for the financial years 2015/16 to 2017/18 is set up to achieve an EBIT margin of 7% (Bang & Olufsen, 2016, p. 32). Though, this seems to be a bit unrealistic and I forecast that it will not be able to achieve this target before 7 years from now.

According to the estimated share price (83.22 DKK), B&O is currently undervalued as the current market stock price is 74.5 DKK as of 1st of November, 2016. The reasons for this discrepancy could be many. B&O PLAY's potential as a growth driver may be underestimated by the investors in the market. Likewise, the effect of the strategic partnerships with LG and HARMAN on sales may to be underrated. B&O has gone through a lot of restructuring lately, which puts it in a much better position.

The forecasted sales at the terminal point is 9,072 mDKK, 244% higher than the sales of FY2015/16. Although this seems like an immense increase, it is in line with what Tue Mantoni expected in his "Leaner, Faster, Stronger" strategy, which suggested that B&O could making sales of as much as 10 billion DKK. While Mantoni did not live up to this objective, my analyses show that B&O does have a strong potential and, with the strategic deals related to the Automotive and Television segments, I forecast that B&O will be able to accelerate its sales. Reasons for why Mantoni was not able to fulfill the sales goal may include that the Television product line was not in good shape when he took over

[26] Extracted from: http://www.stern.nyu.edu/~adamodar/pc/datasets/EVAEurope.xls

the reins and that the Automative business required more investments to keep up its growth, which B&O was not in a position to offer at the time. This has, since then, changed for the better.

Furthermore, it seems reasonable to think that the distress situation of the company might have affected the sales growth of B&O PLAY negatively. Despite the fact that its growth rates have been in the double digits, it seems as if it has a lot more potential. If B&O did not have liquidity problems, it would have been able to invest more resources for B&O PLAY to grow faster. Having solved its liquidity issues, it is realistic to assume that B&O will be able to reach its full growth potential.

6 Sensitivity analysis

The valuation of a company naturally contains some degree of uncertainty and estimation error, as it involves forecasts on the company's future revenues and costs, as well estimations on the cost of capital. A sensitivity analysis works by changing key inputs individually or jointly to get additional insights about the correlation between the dependent variable (i.e., the estimated share price) and different input variables used in the valuation model. I will perform a sensitivity analysis over the stable growth rate and the WACC with respect to the estimated share price. The stable growth rate and the WACC values are arguably the most uncertain values in the model. Conducting the analysis will lead us to get a clearer picture of by how much the estimated share price could change as a result of a change in the two inputs.

6.1 Sensitivity analysis of the WACC

As I calculated two WACC values for the valuation (one for the high-growth period and another for the terminal period), I will perform a sensibility analysis for each of these two values. As I have explained previously, to estimate a precise beta value is a difficult task. Therefore, I will perform a sensibility analysis on the beta value, which is an important component in WACC. Moreover, B&O does not have an official statement regarding its target capital structure – in my analysis I assumed that the NIBD/invested capital would be 11%. Though, it is probable that this could be higher or lower. Thus, I will make a sensibility analysis using this variable as well.

For the high-growth period, I established that the beta will range between 1.35 (the best estimated regression beta I obtained through the MSCI ACWI regression) and 1.92, which was the beta value provided by Reuters (Reuters, 2016). For the terminal period, I established that the beta will range between 1 (assuming that B&O will have an average market risk) and 1.92, assuming that B&O will have problems implementing the new strategy, increasing its risk. For the NIBD/invested capital ratio,

I established that the value will vary between 8.60% (the value that B&O reported in FY2011/12, the lowest value over the last five financial years) and 15.7% (the value that B&O reported in FY2007/08, which was the highest value over the last 10 financial years) (Bang & Olufsen, 2008, p. 56). With these, I computed WACC values for the high-growth period that ranged between 7.92% and 11.51%. For the terminal period, I computed WACC values between 6% and 11.49%. As it can be seen below:

WACC during high-growth period	Beta												
NIBD/inv.cap	1.35	1.40	1.44	1.49	1.53	1.57	1.62	1.67	1.72	1.77	1.82	1.87	1.92
8.60%	8.28%	8.53%	8.78%	9.03%	9.28%	9.54%	9.79%	10.08%	10.36%	10.65%	10.94%	11.23%	11.51%
8.9%	8.26%	8.51%	8.76%	9.01%	9.26%	9.51%	9.76%	10.05%	10.34%	10.62%	10.91%	11.20%	11.48%
9.3%	8.24%	8.49%	8.74%	8.99%	9.24%	9.49%	9.74%	10.03%	10.31%	10.60%	10.88%	11.17%	11.46%
9.6%	8.23%	8.48%	8.72%	8.97%	9.22%	9.47%	9.72%	10.00%	10.29%	10.57%	10.86%	11.14%	11.43%
10.0%	8.21%	8.46%	8.71%	8.95%	9.20%	9.45%	9.70%	9.98%	10.26%	10.55%	10.83%	11.11%	11.40%
10.3%	8.19%	8.44%	8.69%	8.93%	9.18%	9.43%	9.67%	9.96%	10.24%	10.52%	10.80%	11.08%	11.37%
10.7%	8.18%	8.42%	8.67%	8.91%	9.16%	9.40%	9.65%	9.93%	10.21%	10.49%	10.78%	11.06%	11.34%
11.0%	8.16%	8.40%	8.65%	8.89%	9.14%	9.38%	9.63%	9.91%	10.19%	10.47%	10.75%	11.03%	11.31%
11.67%	8.12%	8.37%	8.61%	8.85%	9.10%	9.34%	9.58%	9.86%	10.14%	10.42%	10.69%	10.97%	11.25%
12.34%	8.09%	8.33%	8.57%	8.81%	9.05%	9.30%	9.54%	9.81%	10.09%	10.37%	10.64%	10.92%	11.19%
13.01%	8.06%	8.30%	8.54%	8.77%	9.01%	9.25%	9.49%	9.77%	10.04%	10.31%	10.59%	10.86%	11.14%
13.69%	8.02%	8.26%	8.50%	8.74%	8.97%	9.21%	9.45%	9.72%	9.99%	10.26%	10.53%	10.81%	11.08%
14.36%	7.99%	8.22%	8.46%	8.70%	8.93%	9.17%	9.40%	9.67%	9.94%	10.21%	10.48%	10.75%	11.02%
15.03%	7.96%	8.19%	8.42%	8.66%	8.89%	9.12%	9.36%	9.63%	9.89%	10.16%	10.43%	10.70%	10.96%
15.70%	7.92%	8.15%	8.39%	8.62%	8.85%	9.08%	9.31%	9.58%	9.84%	10.11%	10.37%	10.64%	10.91%

Table 6.1 Sensitivity analysis of WACC during the high-growth period

WACC, terminal period	Beta												
NIBD/invested capit.	1	1.04	1.08	1.12	1.16	1.2	1.24	1.29	1.35	1.49	1.62	1.77	1.92
8.60%	6.22%	6.45%	6.68%	6.91%	7.14%	7.37%	7.60%	7.88%	8.25%	9.00%	9.76%	10.62%	11.49%
8.94%	6.21%	6.44%	6.67%	6.90%	7.12%	7.35%	7.58%	7.86%	8.23%	8.98%	9.73%	10.59%	11.46%
9.29%	6.20%	6.43%	6.65%	6.88%	7.11%	7.34%	7.56%	7.85%	8.21%	8.96%	9.71%	10.57%	11.42%
9.63%	6.19%	6.42%	6.64%	6.87%	7.09%	7.32%	7.55%	7.83%	8.20%	8.94%	9.69%	10.54%	11.39%
9.97%	6.18%	6.40%	6.63%	6.86%	7.08%	7.31%	7.53%	7.81%	8.18%	8.92%	9.66%	10.51%	11.36%
10.31%	6.17%	6.39%	6.62%	6.84%	7.07%	7.29%	7.52%	7.80%	8.16%	8.90%	9.64%	10.49%	11.33%
10.66%	6.16%	6.38%	6.60%	6.83%	7.05%	7.28%	7.50%	7.78%	8.14%	8.88%	9.61%	10.46%	11.30%
11.00%	6.15%	6.37%	6.59%	6.82%	7.04%	7.26%	7.48%	7.76%	8.12%	8.86%	9.59%	10.43%	11.27%
11.67%	6.13%	6.35%	6.57%	6.79%	7.01%	7.23%	7.45%	7.73%	8.09%	8.81%	9.54%	10.38%	11.21%
12.34%	6.10%	6.32%	6.54%	6.76%	6.98%	7.20%	7.42%	7.70%	8.05%	8.77%	9.50%	10.32%	11.15%
13.01%	6.08%	6.30%	6.52%	6.74%	6.95%	7.17%	7.39%	7.66%	8.01%	8.73%	9.45%	10.27%	11.09%
13.69%	6.06%	6.28%	6.49%	6.71%	6.93%	7.14%	7.36%	7.63%	7.98%	8.69%	9.40%	10.22%	11.03%
14.36%	6.04%	6.26%	6.47%	6.68%	6.90%	7.11%	7.33%	7.60%	7.94%	8.65%	9.36%	10.16%	10.97%
15.03%	6.02%	6.23%	6.45%	6.66%	6.87%	7.08%	7.30%	7.56%	7.91%	8.61%	9.31%	10.11%	10.91%
15.70%	6.00%	6.21%	6.42%	6.63%	6.84%	7.05%	7.27%	7.53%	7.87%	8.57%	9.26%	10.06%	10.85%

Table 6.2 Sensitivity analysis of WACC during the terminal period

6.2 Sensibility analysis of the share price

For the stable growth, I established three possible values in the sensitivity analysis over this parameter: 3.52%, 2.54% and 1.55%, which I described as feasible values in see Section 5.2.2. I generated three different tables, combining the three different stable growth rates with the range of the WACC values during the high-growth period (from 7.92% to 11.51%) and the WACC values during terminal period (from 6% to 11.49%).

	g = 1.55%												
	WACC terminal period												
WACC high-growth period	6.00%	6.46%	6.91%	7.48%	7.83%	8.29%	8.74%	9.20%	9.66%	10.11%	10.57%	11.03%	11.49%
7.92%	114.42	100.68	89.60	78.54	73.01	66.73	61.43	56.94	53.10	49.81	46.98	44.54	42.42
8.22%	113.78	100.04	88.95	77.89	72.36	66.08	60.79	56.29	52.46	49.17	46.34	43.89	41.77
8.52%	113.15	99.41	88.32	77.26	71.73	65.45	60.16	55.66	51.83	48.54	45.71	43.26	41.14
8.82%	112.53	98.80	87.71	76.65	71.12	64.84	59.54	55.05	51.21	47.93	45.09	42.65	40.53
9.12%	111.93	98.20	87.11	76.05	70.52	64.24	58.94	54.45	50.62	47.33	44.50	42.05	39.93
9.42%	111.35	97.62	86.53	75.47	69.94	63.66	58.36	53.87	50.03	46.74	43.91	41.47	39.35
9.63%	110.95	97.22	86.13	75.07	69.54	63.26	57.96	53.47	49.64	46.35	43.52	41.07	38.95
10.02%	110.23	96.49	85.41	74.34	68.82	62.53	57.24	52.74	48.91	45.62	42.79	40.34	38.22
10.32%	109.69	95.95	84.87	73.80	68.28	61.99	56.70	52.20	48.37	45.08	42.25	39.80	37.68
10.62%	109.16	95.42	84.34	73.27	67.75	61.47	56.17	51.68	47.84	44.55	41.72	39.28	37.16
10.92%	108.65	94.91	83.82	72.76	67.23	60.95	55.66	51.16	47.33	44.04	41.21	38.76	36.64
11.21%	108.15	94.41	83.32	72.26	66.73	60.45	55.16	50.66	46.83	43.54	40.71	38.26	36.14
11.51%	107.66	93.92	82.83	71.77	66.24	59.96	54.67	50.17	46.34	43.05	40.22	37.77	35.65

Table 6.3 Sensitivity analysis of the share price given a stable growth rate of 1.55%

	g = 2.54%												
	WACC terminal period												
WACC high-growth period	6.00%	6.46%	6.91%	7.48%	7.83%	8.29%	8.74%	9.20%	9.66%	10.11%	10.57%	11.03%	11.49%
7.92%	136.27	116.54	101.30	86.69	79.60	71.72	59.80	52.91	55.25	51.40	48.14	45.34	42.95
8.22%	135.63	115.89	100.66	86.04	78.96	71.07	59.15	52.22	54.60	50.76	47.49	44.70	42.30
8.52%	135.00	115.26	100.03	85.41	78.33	70.44	58.52	51.54	53.98	50.13	46.86	44.07	41.68
8.82%	134.38	114.65	99.41	84.80	77.71	69.83	57.91	50.88	53.36	49.52	46.25	43.46	41.06
9.12%	133.79	114.05	98.81	84.20	77.12	69.23	57.31	50.23	52.76	48.92	45.65	42.86	40.46
9.42%	133.20	113.47	98.23	83.62	76.53	68.65	56.73	49.60	52.18	48.33	45.07	42.27	39.88
9.63%	132.81	113.07	97.83	83.22	76.14	68.25	56.33	49.17	51.78	47.94	44.67	41.88	39.48
10.02%	132.08	112.34	97.11	82.49	75.41	67.53	55.61	48.39	51.06	47.21	43.94	41.15	38.76
10.32%	131.54	111.80	96.57	81.95	74.87	66.99	55.07	47.80	50.52	46.67	43.40	40.61	38.22
10.62%	131.01	111.28	96.04	81.43	74.34	66.46	54.54	47.23	49.99	46.14	42.87	40.08	37.69
10.92%	130.50	110.76	95.53	80.91	73.83	65.94	54.02	46.68	49.48	45.63	42.36	39.57	37.18
11.21%	130.00	110.26	95.03	80.41	73.33	65.44	53.52	46.13	48.97	45.13	41.86	39.07	36.67
11.51%	129.51	109.77	94.54	79.92	72.84	64.95	53.03	45.60	48.49	44.64	41.37	38.58	36.19

Table 6.4 Sensitivity analysis of the share price given a stable growth rate of 2.54%

	g = 3.52%												
	WACC terminal period												
WACC high-growth period	6.00%	6.46%	6.91%	7.48%	7.83%	8.29%	8.74%	9.20%	9.66%	10.11%	10.57%	11.03%	11.49%
7.92%	175.49	143.03	119.80	98.89	89.21	78.78	70.43	63.65	58.09	53.47	49.61	46.36	43.61
8.22%	174.84	142.38	119.15	98.25	88.57	78.13	69.78	63.01	57.44	52.82	48.96	45.72	42.97
8.52%	174.22	141.75	118.52	97.62	87.94	77.50	69.15	62.38	56.81	52.19	48.34	45.09	42.34
8.82%	173.60	141.14	117.91	97.00	87.32	76.89	68.54	61.76	56.20	51.58	47.72	44.47	41.73
9.12%	173.00	140.54	117.31	96.40	86.73	76.29	67.94	61.17	55.60	50.98	47.12	43.88	41.13
9.42%	172.42	139.96	116.73	95.82	86.14	75.71	67.36	60.58	55.02	50.40	46.54	43.29	40.54
9.63%	172.02	139.56	116.33	95.42	85.74	75.31	66.96	60.19	54.62	50.00	46.14	42.90	40.15
10.02%	171.30	138.83	115.61	94.70	85.02	74.58	66.24	59.46	53.89	49.28	45.42	42.17	39.42
10.32%	170.76	138.29	115.07	94.16	84.48	74.04	65.70	58.92	53.35	48.74	44.88	41.63	38.88
10.62%	170.23	137.77	114.54	93.63	83.95	73.52	65.17	58.39	52.83	48.21	44.35	41.10	38.35
10.92%	169.72	137.25	114.02	93.12	83.44	73.00	64.65	57.88	52.31	47.69	43.84	40.59	37.84
11.21%	169.21	136.75	113.52	92.62	82.94	72.50	64.15	57.38	51.81	47.19	43.33	40.09	37.34
11.51%	168.73	136.26	113.03	92.13	82.45	72.01	63.66	56.89	51.32	46.70	42.85	39.60	36.85

Table 6.5 Sensitivity analysis of the share price given a stable growth rate of 3.52%

The values highlighted in green are the share prices that are higher than the estimated value (83.22 DKK) while the share prices highlighted with red are the values below. The sensitivity analysis resulted in values of the estimated share price ranging between 35.65 DKK and 175.49 DKK, representing a decrease of 57% and an increase of 111% over the estimated value, respectively. These two values are significantly different from the estimated value of 83.22 DKK. When conducting such an analysis, it is important to consider that these are worst and best case scenarios and more probable changes would be less drastic than these extreme values.

6.3 Summary of sensitivity analysis with respect to the estimated share price

By carrying out this sensitivity analysis, the range by which B&O's share price could change becomes much clearer. Some of the conclusions that can be drawn by examining the related appendices include the fact that B&O's estimated share price becomes lower the higher the WACC is set. An increase in the WACC could very well be driven by an increase in B&O's beta (as Table 6.1 and Table 6.2 show), which leads to the conclusion that an increase in beta drives the stock price down. This, of course, makes complete sense, as Table 6.3, Table 6.4 and Table 6.5 show. Furthermore, the higher the stable growth is, the higher the share price will be. This, too, makes good sense as the higher the stable growth is, the higher excess return the company will be able to generate.

7 Recommendations for further work

In this chapter I will briefly explore some of the topics that one could continue working on in relation to the valuation of B&O. I will make a brief analysis of B&O's situation from an M&A perspective and suggest ways for analyzing this area further.

7.1 Analyzing B&O from an M&A perspective

Given that interest rates are historically low right now, it becomes interesting to study the valuation of B&O from an M&A perspective. This is mainly because B&O in many aspects is an attractive acquisition target, especially fueled by the low costs of financing. Thus, valuating B&O as a prospect for acquisition would certainly be interesting to study – especially when considering the speculations related to Sparkle Roll in 2015 and 2016 (Børsen, 2016).

7.1.1 Recent events related to M&A

B&O has been under a lot of speculations, rumors and official announcements related to M&A recently, which all started in January 2015, when B&O announced that it would consider bid approaches from competitors (Reuters, 2015). These rumors were not materialized until the 26th of November, 2015, when B&O confirmed that it was in a dialogue regarding a potential launch of takeover – on that day the stock price increased 30.6%, from 55.5 DKK to 72.5 DKK. On the 22th of March 2016, Sparkle Roll confirmed the dialogue about a potential bid for B&O and, soon after, it bought 665,192 shares from Delta Lloyd for 85 DKK a share. Though, on the 15th of April 2016, B&O announced that the actual takeover would not go through, as Sparkle Roll did not commit to launch a tender offer before the established deadline. Former CEO Tue Mantoni resigned on the 26th of April, 2016 – just 11 days after the announcement of the failed Sparkle Roll deal. On the day of Mantoni's resignation, the stock price declined 2.1% (Bloomberg, 2016).

Even though Sparkle Roll's takeover was unsuccessful, it seems that Mr. Qi Jianhong, owner of Sparkle Roll, is still very interested in B&O: On the 8th of August, 2016, and on the 14th of October, 2016, Sparkle Roll announced that it had acquired more shares of B&O. Since the last announcement (on the 14th of October, 2016), the stock price has increased to a value of 74.5 DKK (as of the 1st of November, 2016). It seems that the market is speculating on whether Sparkle Roll will make a tender offer in a near future, which potentially could be at least 85 DKK – the share price that Sparkle Roll paid for the Delta Lloyd shares. For an illustration of these events on a timeline please see Figure 7.1.

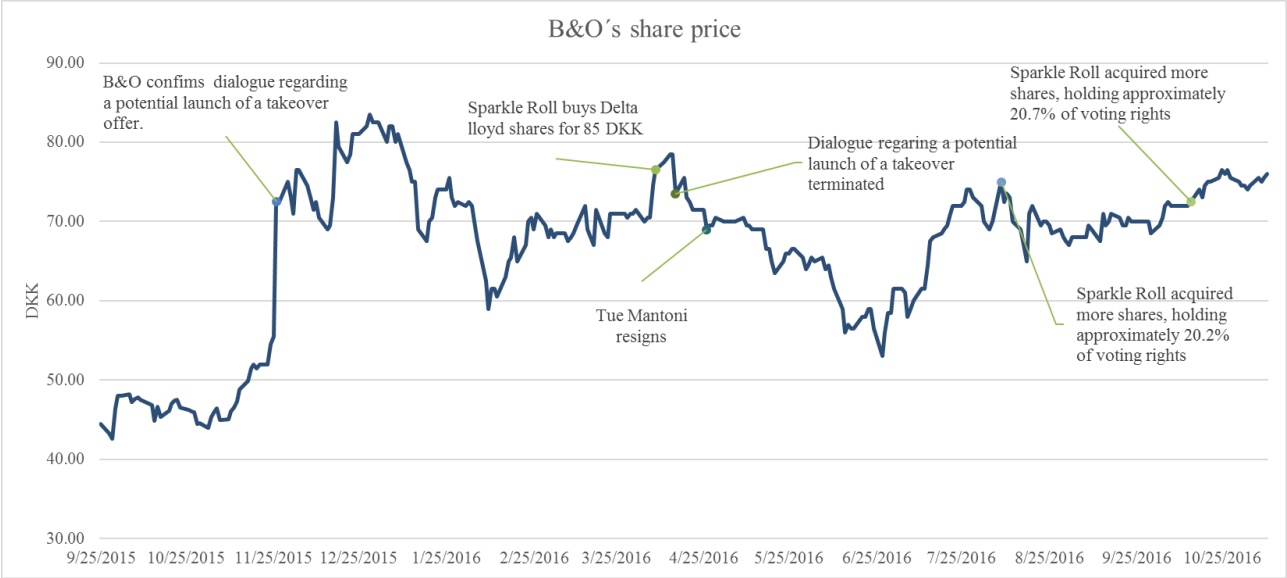


Figure 7.1 Interesting M&A-related events illustrated on a graph of B&O's stock price, own creation

Furthermore, Henrik Clausen's appointment as the new CEO might be part of an M&A strategy plan by the Board. It could be that the Board is dissatisfied with the failed Sparkle Roll deal, although Mantoni has firmly stated that the reason of his departure was not related to the failure of deal (Post, 2016). It seems plausible the Board has decided to look for a CEO they think could reach a successful takeover agreement. In that regard, Henrik Clausen could be a good choice, as his 6 years of international experience in Asia has provided him with an inherit understanding of how business works in Asian countries (GlobeNewswire, 2016). This puts him in a position for being a good candidate to get a successful M&A deal for B&O.

7.1.2 Approach for valuing B&O from an M&A perspective

When valuating B&O from an M&A perspective it would make sense to begin with establishing an overview of the possible M&A strategies B&O would have at its disposal (i.e., a total sale or a partial) and see which strategy would be the one generating the greater shareholder value. Subsequently, it would be necessary to make an assessment of the potential buyers. One would have to study the value creation (synergies) that would be likely to occur as a result of a takeover of any of these buyers (Gaughan, 2007).

In relation to contemplating a partial sale, considering the sale of B&O PLAY might be relevant, as one could argue that B&O PLAY to some extent is building an independent brand from the remainder of B&O. In such a scenario, one would have to value B&O PLAY as a separate entity and, subsequently, value the Bang & Olufsen segment. If the sum of these two segments is higher than the value of B&O as a whole, it might make sense to follow partial-sale strategy.

A suggestion for the part related to identifying potential buyers would be to not only focus on Sparkle Roll but also consider competitors or strategic partners such as LG. An initial thought might be that LG could be interested in expanding its position in the high-end market and, therefore, be inclined to take over B&O. Another candidate could be HP, as they might be likely to follow Apple's example when they purchased Beats. Yet another candidate could be a private equity fund that might want to expand its portfolio with a company such as B&O. This actually happened to B&O's German competitor Loewe that was bought by the private equity firm Stargate Capital (Handelsblatt, 2014).

To summarize, there are many possibilities, potential strategies and simulations to consider when valuating B&O from a M&A perspective. This is especially because of the high level of M&A-related activity B&O has gone through over the past couple of years. Also, as the main analysis of this thesis concludes that the stock price of B&O is currently undervalued, B&O might be able to attract attention from potential buyers that it would not have been able to attract if it were priced correctly (according to my analysis).

8 Conclusion

My main goal of the thesis has been to analyze and estimate the fundamental value of B&O using an intrinsic valuation technique (specifically, the Economic Value Added model). To help me achieve that goal I presented a set of supporting questions covering the topics of company presentation, strategic analysis, financial statement analysis, the valuation itself as well as sensitivity analysis. I laid out the supporting questions in the introduction and subsequently went on to answer them in each of the main chapters of the thesis.

Recent times have not been easy for B&O and the analysis of the current external environment paints a tough picture of the setting that B&O finds itself in. Competition is increasing in all B&O's business areas and this has very much been reflected in the annual reports of the past five financial years. While B&O has invested in the development of products in growing markets, the fierce competition casts doubt over whether B&O will be able to capitalize on its product investments. The strategic analysis shows that B&O certainly has the potential to make the most of the growing markets it operates in but whether it will actually realize its potential is still an open question.

The financial statement analysis covers the accounting quality and both analyzes and reorganizes the income statement and balance sheet for the purpose of valuation. The analysis also includes a profitability analysis using the DuPont model, which shows that the return on equity has been negative

over the past three years. Though, it has been improving and in FY2015/16 the ratio was "only" -8% (compared to -14% in FY2013/14). In addition, the liquidity of B&O was examined and the analysis showed that B&O does have a liquidity issue on its operations. In FY2015/16 the free cash flow was negative with a value of -187 million DKK and, while B&O does have some cash in the bank due to recent sales of its Automotive and ICEpower divisions, B&O will run into a serious liquidity problem if it does not turn its free cash flow around in the near future.

The work done in the chapters of strategic analysis and financial statement analysis served as the foundation for that valuation done in the main chapter of this thesis. This chapter starts out by presenting an overview of the different valuation models that are available when pursuing an intrinsic valuation strategy and, ultimately, the excess return approach was chosen. There are different ways of applying this approach and it was argued that the Economic Value Added model would be the best for valuating a company of B&O's nature. I argued that I would split up the valuation into two periods (a high-growth period and a mature period) and the EVA model does support such an approach very well. Using the EVA model, a set of inputs needed were forecasted and estimated. A thorough process for forecasting the sales of each of the business units was carried out. Also, parameters including the stable growth rate, B&O's stock's relative risk compared to the market (the beta value) and the weighted average cost of capital in each of the two periods were estimated.

Using these analyses, forecasts and estimates, I calculated that the accurate value of B&O should be 3.6 billion DKK and, given that B&O currently has approx. 43.2 million shares, this led to an estimated share price of 83.22 DKK, which is 11.7% higher than the market price of 74.5 DKK on the 1st of November, 2016. As the result of the strategic analysis showed, B&O has completed a set of restructurings in recent years (with respect to the Automotive, Television and ICEpower segments). Moreover, B&O PLAY is looking very promising. The reasons for the discrepancy between my estimated share price and the current share price could include that investors may not have as high hopes for the future sales of B&O PLAY, as I have forecasted in my analysis. Though, as explained in the strategic analysis, B&O PLAY is positioned in a rapidly growing market and has made a set of strategic deals (HARMAN and HP) that will increase its brand awareness in the future.

After having completed the valuation process, I conducted a sensitivity analysis of the estimated share price over uncertain parameters such as the stable growth rate and the estimated WACCs. The analysis shows that B&O's share price indeed is very sensitive to changes in these underlying parameters.

My thesis ends with a brief discussion of the points to be aware of if one were to do a valuation of B&O from an M&A perspective. I comment on some the recent stories that have surrounded B&O and I present some recommendations for how to take these recent stories into account when doing a valuation from an M&A approach. It will be exciting to follow B&O in the years to come to both see if the leadership really will manage to turn the losses into profits and if B&O will be finally purchased.

9 Appendices

9.1 Appendix 1: B&O PLAY and Bang & Olufsen products

Figure 9.1 Products from the B&O PLAY business unit (Beoplay, 2016)

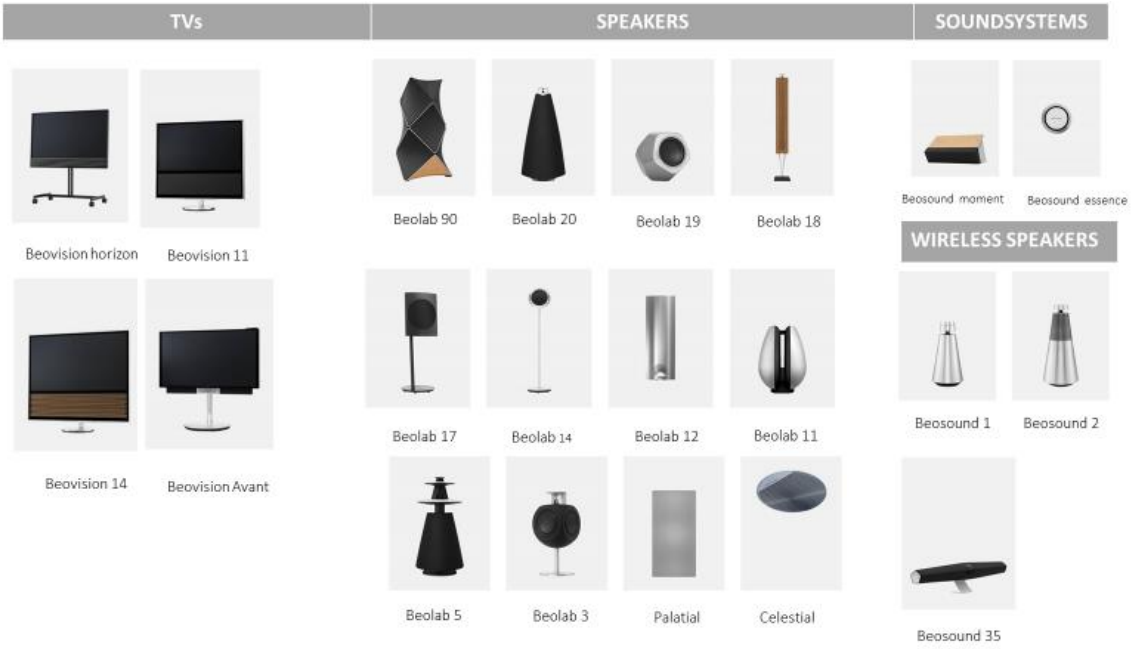


Figure 9.2 Products from the Bang & Olufsen business unit (Bang & Olufsen, 2016)

9.2 Appendix 2: B1&SIS and third-party retailer stores

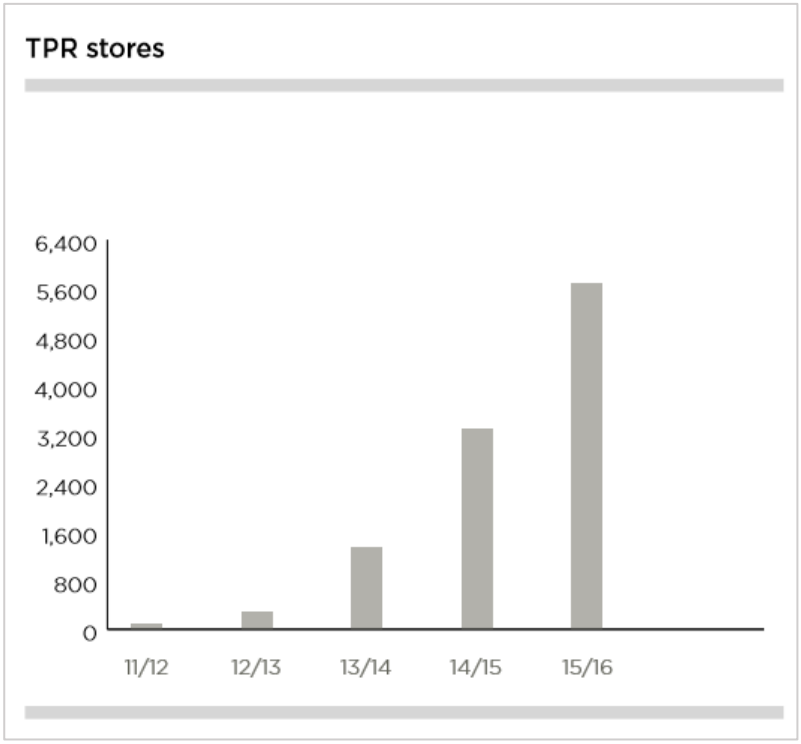


Figure 9.3 Development of third-party retail stores over the past five financial years (Bang & Olufsen, 2016, p. 16)

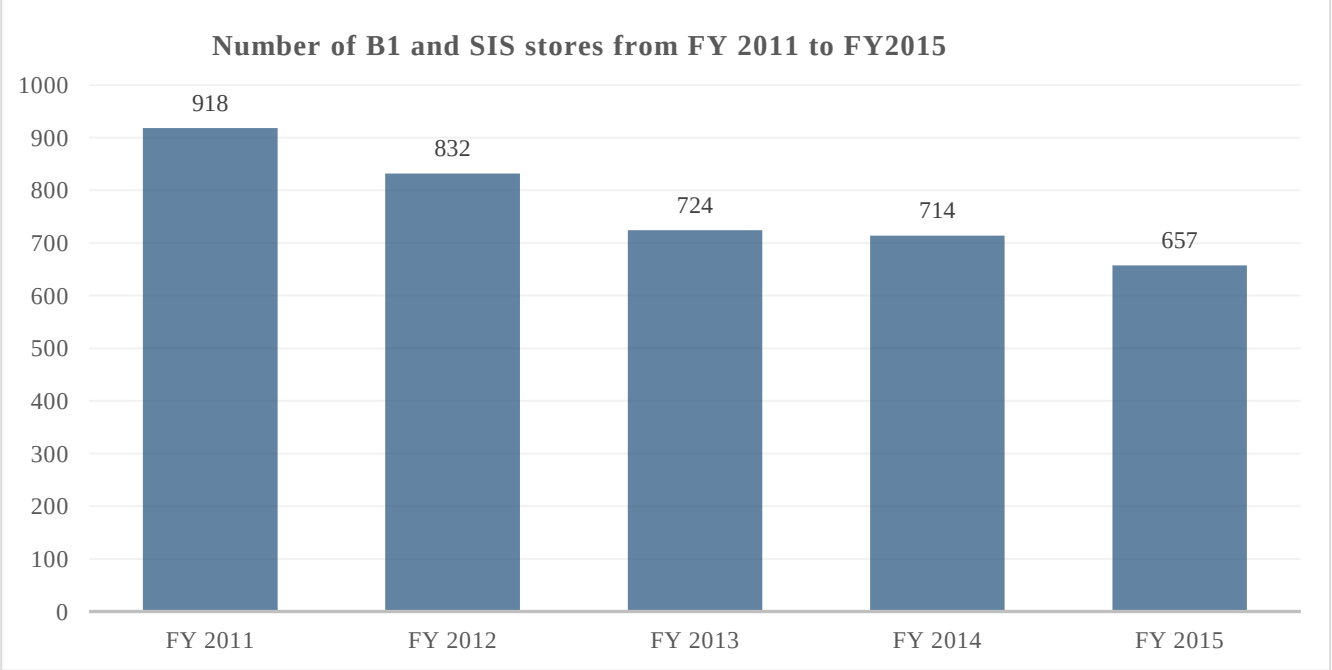


Figure 9.4 Development of B1 and SIS stores in the past five financial years

9.3 Appendix 3: Management

Executive Board	**The Board of directors**
President & CEO: Henrik Clausen	Audit committee: Albert Bensoussa, Jesper Jarlbak & Majken Schultz
Executive Vice President & CFO: Anders Aakær Jensen	Employee elected: Jesper Olesen, Geoff Martin & Brian Bjorn Hansen
Executive Vice President & COO: Stefan Persson	Chairman: Ole Andersen
	Deputive chairman: Jim Hagemann Snabe
	Remuneration committee: Jim Hagemann Snabe, Mads Nippe & Ole Andersen
	Nomination committee: Jesper Jarlbæk, Jim Hagemann Snabe & Ole Andersen
	Non-specified: Juha Chirstensen, Ivan Tong

Table 9.1 Board members based on B&O´s corporate governance website (Bang & Olufsen, 2016)

9.4 Appendix 4: Shareholders

Name	Number of shares	%/share capital	Description	Country
Sparkle Roll	8,922,017	20.65	Holding company	Hong Kong
ATP Fondsmaeglerselskab A/S	5,361,391	12.41	Pension Fund	Denmark
Nordea Bank AB	5,000,659	11.58	Bank	Denmark & Finland
The Vanguard Group, Inc.	595,608	1.38	Investment advisor	U. S
Dimensional Fund Advisors LP	585,608	1.36	Investment advisor	U.S & Ireland
Grace & White incorporated	578,110	1.34	Investment advisor	U. S
Creutz & Partners	300,000	0.69	Investment advisor	Luxemburg
Blackrock	291,763	0.68	Investment advisor	U. S
Gudnme Raaschou invest	260,000	0.60	Investment advisor	Denmark
Lån & Spar Bank	260,000	0.60	Bank	Denmark
Handelsbanken fonder ab	123,406	0.29	Bank	Sweden
Total	22,278,562	51.57		

Table 9.2 B&O's shareholders, based on Bloomberg terminal

9.5 Appendix 5: Euromonitor database

Categories	Geographies	2015	% over World
Consumer Electronics	World	2,721,094.30	100.0%
Consumer Electronics	Asia Pacific	1,236,501.60	45.4%
Consumer Electronics	China	616,898.20	22.7%
Consumer Electronics	Hong Kong, China	12,573.10	0.5%
Consumer Electronics	India	234,689.20	8.6%
Consumer Electronics	Australasia	28,926.60	1.1%
Consumer Electronics	Eastern Europe	129,420.50	4.8%
Consumer Electronics	Latin America	231,826.90	8.5%
Consumer Electronics	Middle East and Africa	209,691.10	7.7%
Consumer Electronics	North America	484,683.70	17.8%

Consumer Electronics	USA	451,890.20	16.6%
Consumer Electronics	Western Europe	400,043.80	14.7%

Table 9.3 Consumer electronic country market share 2015, extracted from Euromonitor database

Companies (%)	2011	2012	2013	2014	2015
Samsung Corp	18.40	20.30	20.50	21.20	20.80
LG Corp	13.20	14.40	15.10	15.70	15.70
Hisense Group	9.60	7.90	8.60	8.20	8.70
Sony Corp	8.40	6.70	6.40	6.50	6.00
Total	49.60	49.30	50.60	51.60	51.20

Table 9.4 TV market share, extracted from Euromonitor database

Companies (%)	2011	2012	2013	2014	2015
Sony Corp	19.40	19.80	19.90	18.70	17.80
Samsung Corp	7.00	7.70	8.40	8.90	9.30
Philips NV	8.40	8.60	8.10	8.50	8.90
Bose Corp	4.10	4.80	5.40	5.80	6.40
Panasonic Corp	7.50	7.20	6.70	6.50	6.30
LG Corp	4.70	4.90	5.00	5.20	5.10
Total	51.10	53	53.50	53.60	53.80
Bang & Olufsen	0.20	0.20	0.10	0.10	0.10

Table 9.5 Home audio & cinema market share, extracted from Euromonitor database

Worldwide retail volume (thousands)	2011	2012	2013	2014	2015
Televisions	248,974	241,584	237,644	236,614	221,533
Home & Audio cinema	98,905	95,405	93,291	90,732	86,317

Table 9.6 World retail sales TV and home & audio cinema, extracted from Euromonitor database

9.6 Appendix 6: Global passenger car sales

NEW PC REGISTRATIONS OR SALES	2011	2012	2013	2014	2015
World	57,630,635	60,670,449	63,102,830	65,417,380	66,311,917
United States	6,089,403	7,241,900	7,585,341	7,749,432	7,572,662
Russia	2,653,688	2,755,384	2,649,181	2,333,067	1,284,366
Central and South America	4,596,605	4,761,199	4,792,718	4,283,574	3,485,477
Europe	17,167,600	16,191,359	15,941,852	16,157,435	16,424,352
Asia, Oceania and Middle East	27,429,521	29,895,832	32,104,232	34,490,722	36,098,641

Table 9.7 Global passenger car sales from 2011 to 2015 (International Organization of Motor Vehicle Manufacturers, 2016)

9.7 Appendix 7: Adjusted income statement from transitory items

	Original	Adjusted	Original	Adjusted	Original	Adjusted
DKK million	**FY 2013**	**FY 2013**	**FY 2014**	**FY 2014**	**FY 2015**	**FY 2015**
Revenue	2,161.7	2,161.7	2,356.5	2,356.5	2,633.4	2,633.4
Production costs	(1,332)	(1,332)	(1,776)	(1,776)	(1,682)	(1,682)
Gross profit	**829.7**	**829.7**	**580.3**	**580.3**	**951.9**	**951.9**
Other operating income	-				**42.1**	**42.1**
Operating expenses	**(1,091)**	**(1,086)**	**(1,387.3)**	**(903.3)**	**(1,196)**	**(1,196)**
Research and Development costs	(292.8)	(292.8)	(448.5)	(448.5)	(314.8)	(314.8)
Distribution and marketing costs	(731.9)	(731.9)	(861.7)	(861.7)	(740.3)	(740.3)
Administration costs	(65.8)	(65.8)	(77.1)	(77.1)	(104.3)	(104.3)
Other operating expenses	-		-	-	(36.8)	(36.8)
Other one-time charges		5.0		484.0		72.9
Adjustment	0.2	0.2				
Operating profit (EBIT)	**(260.6)**	**(255.6)**	**(807.0)**	**(323.0)**	**(202.2)**	**(129.3)**
Financial items, net	**(28.9)**	**(28.9)**	**(6.2)**	**(6.2)**	**(38.9)**	**(39.3)**
Financial income	5.6	5.6	24.8	24.8	1.6	1.6
Interest income	0.2	0.2	0.8	0.8	0.9	0.9
Other financial income	5.4	5.4	4.5	4.5	0.7	0.7
Forex exchange gain			19.5	19.5		
Financial costs	(34.5)	(34.5)	-30.9	(30.9)	(40.4)	(40.4)
Interest expense	(18.4)	(18.4)	-16.8	(16.8)	(10.9)	(10.9)
Foreign exchange loss	(4.6)	(4.6)			(11.3)	(11.3)
Other financial costs	(11.5)	(11.5)	-14.1	(14.1)	(18.20)	(18.2)
Income/Loss from affiliates	3.2	3.2	10.5	10.5	-0.4	-0.4
Adjustment	(0.1)	(0.1)	-0.1	-0.1	-0.1	-0.1
Earnings before tax (EBT)	**(286.4)**	**(281.4)**	**(802.7)**	**(318.7)**	**(241.5)**	**(168.6)**
Abnormal losses (gains)		(5.0)		(484.0)		(72.9)
Other one-time charges		(5.0)		(484.0)		
Merger and Acquisition expense						(9.0)
Disposal of assets						4.1
Asset write down						(36.6)
Restructuring						(16.0)
Severance Package						(15.4)
Pre-tax income	**(286.4)**	**(286.4)**	**(802.7)**	**(802.7)**	**(241.5)**	**(241.5)**
Corporation tax, continue operations	58.7	58.7	195.4	195.4	43.8	43.8
Earnings for the year - continuing operations	(227.7)	(227.7)	(607.3)	(607.3)	(197.7)	(197.8)
Corporate tax rate, continuing operations	20%	20.50%	24%	24%	18.1%	18.1%

Earnings for the year - discontinued operations	263.1	263.1	225.4	225.4	36.5	36.5
Corporation tax, discontinue operations	64.5	64.5	53.0	53.0	7.4	7.4
Corporation tax rate discontinue operations	25%	25%	24%	24%	20%	20%
Earnings discontinue operations	198.6	198.6	172.4	172.4	29.10	29.10
Gain/loss on sale/acquisition after tax	-	-	491.9	491.9	-39.00	-39.00
Earnings discontinue operations after tax	198.6	198.6	664.3	664.3	-9.90	-9.90
Total corporation tax	123.2	123.2	399.5	399.5	51.20	51.20
Adjustment	0.1					
Abnormal losses (gains) - after tax		**4.0**		**366.2**		**59.68**
Other one-time charges		4.0		366.2		
Merger and Acquisition expense						7.37
Disposal of assets						(3.36)
Asset write down						29.96
Restructuring						13.10
Severance Payment						12.61
Tax effects on abnormal items difference		(1.0)		(117.8)		(13.22)
Income tax effect (benefit) adjusted		57.7		77.6		30.58
Earnings for the year- continuing operations	**(227.6)**	**(223.7)**	**(607.3)**	**(241.1)**	**(197.8)**	**(138.02)**
Earnings for the year- discontinue operations	**(29)**	**(25.1)**	**57.0**	**423.2**	**(207.7)**	**(147.92)**

Table 9.8 Adjusted income statement from transitory items

9.8 Appendix 8: Analytical income statement

DKK million	FY 2013/14	FY 2014/15	FY 2015/16
Revenue	2,161.7	2,356.5	2,633.4
Production costs	(1,332.0)	(1,776.2)	(1,681.5)
Gross profit	**829.7**	**580.3**	**951.9**
Other operating income			42.1
Operating expenses	(1,085.5)	(903.3)	(1,123.3)
Research and Development costs	(292.8)	(448.5)	(314.8)
Distribution and marketing costs	(731.9)	(861.7)	(740.3)
Administration costs	(65.8)	(77.1)	(104.3)
Other operating expenses		-	(36.8)
Other one-time charges	5.0	484.0	72.9
EBIT	**(255.8)**	**(323.0)**	**(129.3)**

Depreciation and amortization	331.9	342.1	430.8
EBITDA	**76.1**	**19.1**	**301.5**
Tax expense operations	57.7	77.6	30.6
Tax shield from debt financing	5.27	1.07	7.11
Net tax	52.4	78.7	23.5
NOPAT	**(203.4)**	**(244.3)**	**(105.8)**
Financial income	5.6	24.8	1.6
Interest income	0.2	0.8	0.9
Other financial income	5.4	4.5	0.7
Forex exchange gain		19.5	
Financial costs	(31.3)	(20.4)	(40.8)
Interest expense	(18.4)	(16.8)	(10.9)
Foreign exchange loss	(4.6)		(11.3)
Other financial costs	(11.5)	(14.1)	(18.2)
Income/Loss from affiliates	3.2	10.5	-0.4
Financial items, net	**(25.7)**	**4.4**	**(39.2)**
Tax shield from debt financing	**5.27**	**1.07**	**7.11**
Net financial expenses after tax	**-20.43**	**3.33**	**-32.09**
Net income, no discontinue operations	**-223.8**	**-241**	**-138**

Table 9.9 Analytical income statement

9.9 Appendix 9: Analytical balance sheet

DKK million	FY 2011/12[27]	FY 2012/14	FY 2013/14	FY 2014/15	FY 2015/16
Goodwill	47.8	51.9	63.5	70.2	66.4
Acquired rights	27.8	20.7	14.5	8.0	6.1
Completed development projects	296.8	484.7	406.2	312.1	231.2
Development projects in progress	338.9	178.2	317.6	80.3	151.6
Land and buildings	210.3	198.2	114.7	104.6	97.8
Plant and machinery	145.6	155.6	123.5	68.9	63.5
Other equipment	29.3	24.4	26.8	26.8	18.9
Leasehold improvements	17.5	30.2	39.5	44.9	21.8
Tangible assets in course of construction	96.8	67.5	29.8	9.1	7.7
Total non-current assets	**1,210.8**	**1,211.4**	**1,136.1**	**724.9**	**665.0**
Deferred tax assets	139.9	183.4	180.4	187.5	209.0

[27] FY 2011/12 and FY 2012/13 have been included as these years have been used for some computations (e.g., pro-forma statements and cost of capital).

Inventories	665	572.1	666.2	533.1	498.0
Receivables	623.9	554.4	694.0	581.5	528.4
Total current assets	**1,428.8**	**1,309.9**	**1,540.6**	**1,302.1**	**1,235.4**
Total Operating assets	**2,639.6**	**2,521.3**	**2,676.7**	**2,027.0**	**1,900.4**
Pensions	9.8	12.4	13.3	17.1	14.8
Deferred tax	15.4	13.8	7.7	10.6	11.5
Provisions	141	51.8	68.6	70.2	68.2
Provisions, non-current assets	86.2	12.4	39.8	44.8	43.4
Provisions, current	54.8	39.4	28.8	25.4	24.8
Trade payables	384.8	295.3	434.0	443.1	365.4
Corporation tax payable	27.8	25.5	18.1	33.7	9.3
Other liabilities	259.9	226.9	215.8	309.1	270.5
Deferred income	19.2	23.1	33.9	216.4	176.5
Deferred income, non-current		0	-	148.7	136.7
Deferred income, current	19.2	23.1	33.9	67.7	39.8
Other non-current liabilities	0.9	3.1	1.9	1.6	1.1
Total Operating liabilities	**858.8**	**651.9**	**793.3**	**1,101.8**	**917.3**
Invested capital	**1,780.8**	**1,869.4**	**1,883.4**	**925.2**	**983.1**
Mortgage loans, long term part	212.9	206.1	197.8	191.1	181.1
Mortgage loans, short term part	6.6	6.8	8.2	8.4	8.5
Loans from banks, short term part	150	150	220.0	210.0	-
Liabilities associated with assets held for sale	0	0	-	16.3	-
Overdraft facilities	37.8	56.2	68.5	-	-
Total financial liabilities	**407.3**	**419.1**	**494.5**	**425.8**	**189.6**
Investment property	41.3	40	38.6	17.2	16.5
Investments in associates	5.6	7	10.2	5.9	-

Other financial receivables	46.6	42.7	44.2	123.3	30.6
Cash	159.1	145.9	120.4	1,198.0	788.5
Assets held for sale	0	0	-	77.6	2.9
Receivables from associates	2.4	1.8	1.9	-	93.1
Total financial assets	**255**	**237.4**	**215.3**	**1,422.0**	**931.6**
Financial expenses, net (NIBD)	**152.3**	**181.7**	**279.2**	**(996.2)**	**(742.0)**
Equity	**1,626**	**1,640.4**	**1,604.4**	**1,921.4**	**1,724.9**

Table 9.10 Analytical balance sheet

9.10 Appendix 10: Income statement: Trend and common size analysis

Trend analysis income statement			
DKK million	2013/2014	2015/2016	2015/2016
Revenue	100	109	122
Production costs	100	133	126
Gross profit	100	70	115
Research and Development costs	100	153	108
Distribution and marketing costs	100	118	101
Administration costs	100	117	159
EBIT	100	126	51
Depreciation and amortisation	100	103	130
EBITDA	100	25	396
Tax expense operations	100	135	53
Tax shield from debt financing	100	20	135
NOPAT	100	120	52
Financial income	100	443	29
Financial costs	100	65	130
Financial items, net	100	(17)	153
Net financial expenses after tax	100	(16)	157
Net income without, no DO	100	108	62

Table 9.11 Trend analysis of income statement

DKK million	FY 2013/14	FY 2014/15	FY 2015/16
Revenue	100%	100%	100%
Production costs	-61.62%	-75.37%	-63.85%
Gross profit	**38.38%**	**24.63%**	**36.15%**
Other operating income	0.00%	0.00%	1.60%
Operating expenses	**-50.22%**	**-38.33%**	**-42.66%**
Research and Development costs	-13.54%	-19.03%	-11.95%
Distribution and marketing costs	-33.86%	-36.57%	-28.11%
Administration costs	-3.04%	-3.27%	-3.96%
Other operating expenses	0.00%	0.00%	-1.40%
Other one-time charges	0.23%	20.54%	2.77%
EBIT	**-11.83%**	**-13.71%**	**-4.91%**
Depreciation and amortization	15.35%	14.52%	16.36%
EBITDA	**3.52%**	**0.81%**	**11.45%**
Tax expense operations	2.67%	3.29%	1.16%
Tax shield from debt financing	0.24%	0.05%	0.27%
Net tax	2.42%	3.34%	0.89%
NOPAT	**-9.41%**	**-10.37%**	**-4.02%**
Financial income	0.26%	1.05%	0.06%

Interest income	0.01%	0.03%	0.03%
Other financial income	0.25%	0.19%	0.03%
Forex exchange gain	0.00%	0.83%	0.00%
Financial costs	-1.45%	-0.87%	-1.55%
Interest expense	-0.85%	-0.71%	-0.41%
Foreign exchange loss	-0.21%	0.00%	-0.43%
Other financial costs	-0.53%	-0.60%	-0.69%
Income/Loss from affiliates	0.15%	0.45%	-0.02%
Financial items, net	-1.19%	0.19%	-1.49%
Tax shield from debt financing	0.24%	0.05%	0.27%
Net financial expenses after tax	**-0.95%**	**0.14%**	**-1.22%**
Net income before discounted operations	**-10.35%**	**-10.23%**	**-5.24%**

Table 9.12 Common size analysis of income statement

9.11 Appendix 11: Balance sheet: Trend and common size analysis

DKK million	FY2013/14	FY2014/15	FY2015/16
Goodwill	100.0	110.6	104.6
Acquired rights	100.0	55.2	42.1
Completed development projects	100.0	76.8	56.9
Development projects in progress	100.0	25.3	47.7
Land and buildings	100.0	91.2	85.3
Plant and machinery	100.0	55.8	51.4
Other equipment	100.0	100.0	70.5
Leasehold improvements	100.0	113.7	55.2
Tangible assets in course of construction and prepay-ments for tangible assets	100.0	30.5	25.8
Total non-current assets	**100.0**	**63.8**	**58.5**
Deferred tax assets	100.0	103.9	115.9
Inventories	100.0	80.0	74.8
Receivables	100.0	83.8	76.1
Total current assets	**100.0**	**84.5**	**80.2**
Total Operating assets	**100.0**	**75.7**	**71.0**
Pensions	100.0	128.6	111.3
Deferred tax	100.0	137.7	149.4
Provisions	100.0	102.3	99.4
Trade payables	100.0	102.1	84.2
Corporation tax payable	100.0	186.2	51.4
Other liabilities	100.0	143.2	125.3
Deferred income	100.0	638.3	520.6
Other non-current liabilities	**100.0**	**84.2**	**57.9**
Total Operating liabilities	**100.0**	**138.9**	**115.6**
Invested capital	**100.0**	**49.1**	**52.2**
Mortgage loans, long term	100.0	96.6	91.6
Mortgage loans, short term part	100.0	102.4	103.7
Loans from banks, short term part	100.0	95.5	-
Liabilities associated with assets held for sale			
Overdraft facilities	100.0	-	-
Total financial liabilities	**100.0**	**86.1**	**38.3**
Investment property	100.0	44.6	42.7
Investments in associates	100.0	57.8	-
Other financial receivables	100.0	279.0	69.2
Cash	100.0	995.0	654.9
Assets held for sale			
Receivables from associates	100.0	-	4,900.0
Total financial assets	**100.0**	**660.5**	**432.7**
Financial expenses, net	100.0	(356.8)	(265.8)
Equity	100.00	119.76	107.51

Table 9.13 Trend analysis of balance sheet

DKK million	FY2013/14	FY2014/15	FY2015/16
Goodwill	3.37%	7.59%	6.75%
Acquired rights	0.77%	0.86%	0.62%
Completed development projects	21.57%	33.73%	23.52%
Development projects in progress	16.86%	8.68%	15.42%
Land and buildings	6.09%	11.31%	9.95%
Plant and machinery	6.56%	7.45%	6.46%
Other equipment	1.42%	2.90%	1.92%
Leasehold improvements	2.10%	4.85%	2.22%
Tangible assets in course of construction and prepayments for tangible assets	1.58%	0.98%	0.78%
Total non-current assets	**60.32%**	**78.35%**	**67.64%**
Deferred tax assets	9.58%	20.27%	21.26%
Inventories	35.37%	57.62%	50.66%
Receivables	36.85%	62.85%	53.75%
Total current assets	**81.80%**	**140.74%**	**125.66%**
Total Operating assets	**142.12%**	**219.09%**	**193.31%**
Pensions	0.71%	1.85%	1.51%
Deferred tax	0.41%	1.15%	1.17%
Provisions	3.64%	7.59%	6.94%
Trade payables	23.04%	47.89%	37.17%
Corporation tax payable	0.96%	3.64%	0.95%
Other liabilities	11.46%	33.41%	27.52%
Deferred income	1.80%	23.39%	17.95%
Other non-current liabilities	0.10%	0.17%	0.11%
Total Operating liabilities	**42.12%**	**119.09%**	**93.31%**
Invested capital	**100.00%**	**100.00%**	**100.00%**
Mortgage loans, long term	10.50%	20.65%	18.42%
Mortgage loans, short term part	0.44%	0.91%	0.86%
Loans from banks, short term part	11.68%	22.70%	0.00%
Liabilities associated with assets held for sale	0.00%	1.76%	0.00%
Overdraft facilities	3.64%	0.00%	0.00%
Total financial liabilities	**26.26%**	**46.02%**	**19.29%**
Investment property	2.05%	1.86%	1.68%
Investments in associates	0.54%	0.64%	0.00%
Other financial receivables	2.35%	13.33%	3.11%
Cash	6.39%	129.49%	80.21%
Assets held for sale	0.00%	8.39%	0.29%
Receivables from associates	0.10%	0.00%	9.47%
Total financial assets	**11.43%**	**153.70%**	**94.76%**
Financial expenses, net	**14.82%**	**-107.67%**	**-75.48%**
Equity	**85.19%**	**207.67%**	**175.46%**

Table 9.14 Common size analysis of balance sheet

9.12 Appendix 12: Adjusted cash flow statement

Cash flow statement	FY2015/16 Original	FY2015/16 Adjusted	FY2014/15 Original	FY2014/15 Adjusted	FY2013/14
Earnings from continuing	-197.8	-197.8	-607.3	-607.3	
Earning from discontinuing	-9.9	0	664.3	0	
Depreciation	248.4	248.4	430.8	430.8	
Non-cash items	-9.3	-48.3	-662.3	-19.3	
Change in receivables	64.9	64.9	10.6	10.6	
Change in inventory	30.2	30.2	78.5	78.5	
Change in payables	-127.7	-127.7	155.8	155.8	
Interest	-9.3	-9.3	-6.1	-6.1	
Income tax	5.1	5.1	-9.2	-9.2	
CFO	-5.4	-34.5	55.1	33.8	
Purchase of intangible non-current assets	-165.8	-165.8	-209.2	-209.2	
Purchase of tangible non-current assets	-46	-46	-82.9	-82.9	
Sales of tangible non-current assets	1.7	1.7	0		
Proceeds from sale of associated companies	5.5	5.5	12.5	12.5	
Proceeds from sale of business	23		1110.8	0	
Received reimbursements, intangible non-current assets	0		12.5	12.5	
Change in financial receivables	0		12	14	
CFI	-181.6	-204.6	855.7	-253.1	
Free cash flow	-187	-239.10	910.80	-219.30	
CFF	-222.8	-222.8	233.4	233.4	
Change in cash and equivalents	-409.60	-461.90	1144.20	14.10	
Cash	786.50	-395.90	1196.10	66.00	51.9

Table 9.15 Adjusted cash flow statement

Non-cash items	FY2015/16 Original	FY2015/16 Adjusted	FY2014/15 Original	FY2014/15 Adjusted
Change in other liabilities	-18.7	-18.7	7	7
Financial income	-1.6	-1.6	-24.8	-24.8
Financial costs	40.5	40.5	30.9	30.9
Results of investments in associates after tax	0.4	0.4	-10.5	-10.5
Gain/loss on sale of non-current assets	-4.2	-4.2	1.8	1.8
Gain/loss on sale of business	39	0	-643	0
Tax on earnings for the year	-36.4	-36.4	8.7	8.7
Other adjustments	-28.3	-28.3	-32.4	-32.4
Total adjustments	-9.3	-48.3	-662.3	-19.3

Table 9.16 Non-cash items

9.13 Appendix 13: Cash burn rate

	FY2013/14	FY2014/15	FY2015/16
Cash	120.4	1198	788.5
Account receivable	694	581.5	528.4
Financial assets	94.9	224	143.1
Easy converted to cash assets	*909.3*	*2003.5*	*1460*
EBIT	255.8	323	129.3
Cash burn rate	**3.55**	**6.20**	**11.29**

Table 9.17 Liquidity ratios

9.14 Appendix 14: Pro-forma income statement and balance sheet

Please see the following two pages for the pro-forma income statement and the pro-forma balance sheet.

Income statement	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	Terminal period
Revenue	**3,065.64**	**3,912.22**	**5,369.92**	**6,557.88**	**7,659.34**	**8,410.34**	**8,847.71**	**9,072.00**
Production costs	1,819.51	2,273.71	3,103.92	3,790.58	4,427.25	4,861.34	5,114.15	5,243.79
Gross profit	1,246.13	1,638.51	2,266.00	2,767.30	3,232.10	3,549.00	3,733.56	3,828.21
Operating expenses	**1,298.72**	**1,622.58**	**2,179.42**	**2,603.26**	**2,972.42**	**3,189.09**	**3,276.29**	**3,278.69**
Research and Development costs	363.58	460.30	626.74	759.21	879.51	957.81	999.28	1,016.06
Distribution and marketing costs	837.45	1,037.62	1,381.56	1,635.08	1,848.84	1,963.28	1,995.06	1,973.54
Administration costs	97.69	124.67	171.12	208.97	244.07	268.00	281.94	289.09
EBIT	(52.59)	15.93	86.58	164.04	259.68	359.91	457.28	549.52
Depreciation and amortization	275.91	212.87	302.75	382.62	461.94	523.78	568.41	600.66
EBITDA	223.32	228.80	389.33	546.66	721.62	883.68	1,025.69	1,150.18
Tax expense operations	12.36	3.74	20.35	38.55	61.02	84.58	107.46	129.14
Tax shield from debt financing	1.22	1.60	2.24	2.80	3.34	3.75	4.03	4.21
Net tax	11.13	5.34	22.59	41.35	64.37	88.33	111.49	133.35
NOPAT	**(41.45)**	**10.59**	**63.99**	**122.69**	**195.31**	**271.58**	**345.79**	**416.17**
Financial items, net	(5.21)	(6.80)	(9.55)	(11.92)	(14.22)	(15.95)	(17.13)	(17.93)
Tax shield from debt financing	1.22	1.60	2.24	2.80	3.34	3.75	4.03	4.21
Net financial expenses after tax	(3.98)	(5.20)	(7.30)	(9.12)	(10.88)	(12.20)	(13.11)	(13.72)
Net income	**(45.44)**	**5.38**	**56.69**	**113.57**	**184.43**	**259.38**	**332.69**	**402.46**

Balance sheet	2016/17	2017/19	2018/19	2019/20	2020/21	2021/22	2022/23	Terminal period
Total-non-current assets	613.13	811.78	1,154.51	1,459.09	1,761.59	1,997.38	2,167.59	2,290.56
Total current assets	1,438.17	1,835.33	2,519.18	3,076.48	3,593.21	3,945.52	4,150.70	4,255.92
Total non-interest bearing debt (operating liabilities)	1,067.9	1,362.8	1,870.5	2,284.3	2,668.0	2,929.6	3,081.9	3,160.1
Net working capital	370.3	472.6	648.7	792.2	925.2	1,015.9	1,068.8	1,095.8
Invested capital (net operating assets)	983.4	1,284.4	1,803.2	2,251.2	2,686.8	3,013.3	3,236.3	3,386.4
Financial expenses, net (NIBD)	108.18	141.28	198.35	247.64	295.55	331.46	356.00	372.51

9.15 Appendix 15: Forecasted gross margin

Financial year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Sales Revenues	3007	2813	2161	2356	2633	3,065	3,912	5,369	6,557	7,659	8,410	8,847
Production costs	1792	1718	1332	1776	1681	1,886	2,407	3,303	3,790	4,427	4,861	5,114
Reduction in production costs LG						66.67	133.33	200				
Production costs after the LG strategy plan						1,819	2,273	3,103				
Gross profit	1215	1095	829	580	951	1,246	1,638	2,266	2767	3232	3549.	3733
Gross margin %	40.4	39	38.4	24.6	36.1	40.6	41.9	42.2	42.2	42.2	42.2	42.2
Production costs/sales revenues %	60	61	62	75	64	59.4	58.1	57.8	57.8	57.8	57.8	57.8
Average production costs %	61.5											

Table 9.18 Forecasted gross margin calculations

9.16 Appendix 16: Capacity costs FY2011/12-FY2015/16

Financial year	2011/12	2012/13	2013/14	2014/15	2015/16
Sales	3,007.7	2,813.9	2,161.7	2,356.5	2,633.4
Research and Development costs	337.4	442.4	292.8	448.5	314.8
Distribution and marketing costs	654.3	754.7	731.9	861.7	740.3
Administration costs	101.6	85.9	65.8	77.1	104.3

Table 9.19 Capacity costs FY2011/12-FY2015/16

Financial year	2011/12	2012/13	2013/14	2014/15	2015/16
Research and Development costs/sales	11.2%	15.7%	13.5%	19.0%	12.0%
Distribution and marketing costs/sales	21.8%	26.8%	33.9%	36.6%	28.1%
Administration costs/sales	3.4%	3.1%	3.0%	3.3%	4.0%

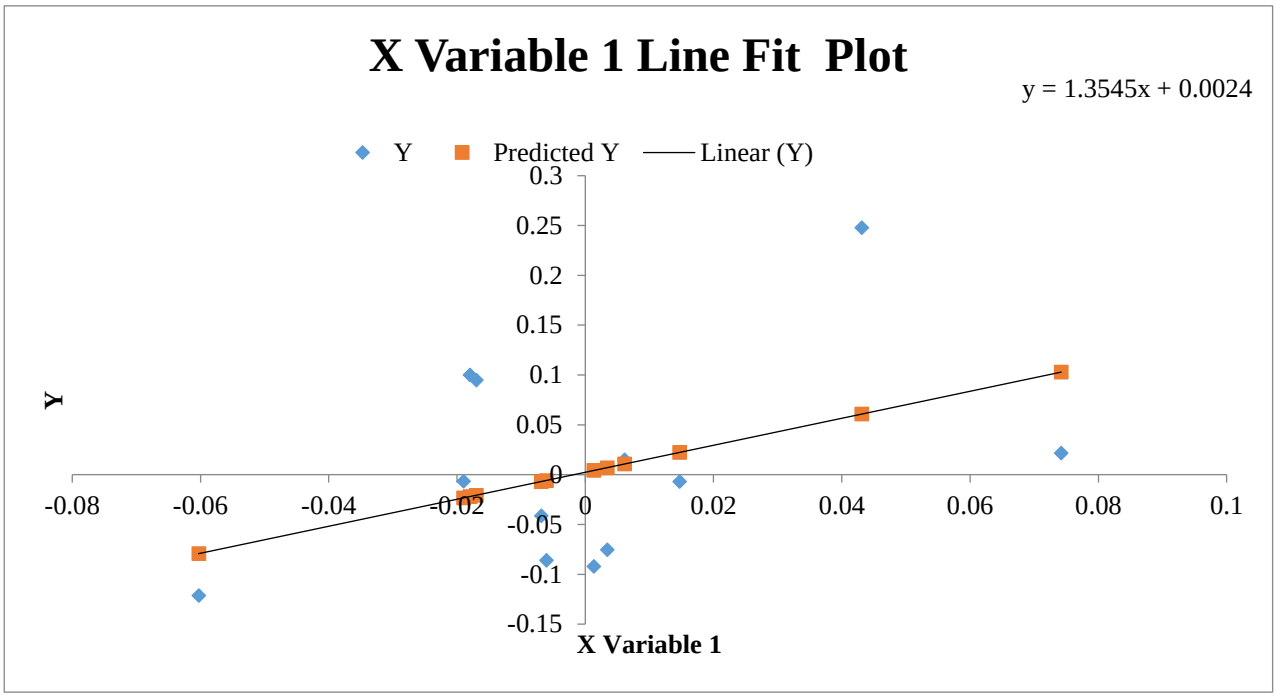
Table 9.20 Capacity costs/sales FY2011/12-FY2015/16

9.17 Appendix 17: Interest bearing debt/total assets

Financial year	2005/06	2006/07	2007/08	Average
Interest bearing debt/total assets	9.70%	9.30%	15.70%	11.57%

Table 9.21 Interest bearing debt/total assets FY2005/06-FY2007/08, (Bang & Olufsen, 2008, p. 56) (Bang & Olufsen, 2007, p. 52)

9.18 Appendix 18: Estimating beta via regression



SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.435575
R Square	0.189725
Adjusted R Square	0.108698
Standard Error	0.098190
Observations	12

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	0.02257526	0.022575	2.341502	0.15696553
Residual	10	0.09641359	0.009641		
Total	11	0.11898886			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	0.0023754	0.0283681	0.08373	0.934919	-0.0608328	0.06558	-0.0608328	0.0655836
X Variable 1	**1.354506**	0.8851845	1.53019	0.156965	-0.6178074	3.32682	-0.6178074	3.3268206

9.19 Appendix 19: Email correspondence with financial analyst from SEB

RE: Master thesis on Bang & Olufsen

kristian.godiksen@seb.dk

lun 31/10/2016 7:33
Para:Andrea Notario <anno13ac@student.cbs.dk>;

Dear Andrea,

I haven't taken up official coverage yet.

I'm considering a WACC of 10% to take the elevated risk and low visibility into account.

Good luck.

Best
Kristian

Best regards,

Kristian Godiksen
Equity analyst, Retail, Service and Utilities
Phone: +45 33 28 33 09
Mobile: +45 53 69 92 41

From: Andrea Notario [mailto:anno13ac@student.cbs.dk]
Sent: 28 October 2016 17:00
To: Godiksen, Kristian
Subject: Master thesis on Bang & Olufsen

Dear Kristian,

I am a student from CBS from the master in applied economics and finance and I am currently doing my master thesis on a valuation of Bang & Olufsen. I have seen that you are the contact person for the analysts that are covering the Bang & Olufsen stock in SEB.

I would like to ask you if it would be possible to ask you for the recommendations that you have been doing in this stock, specially the valuation value and the WACC.I would like them use them as a benchmark for my valuation.

Looking forward to hearing from you and thank you very much for your attention,

Andrea Notario

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12 References

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