Strategic and Financial Valuation of Carlsberg A/S

Assessment of Future Strategic Options to Increase Value and Improve Market Position

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Executive Summary

The main aim of the thesis is to estimate the intrinsic value of Carlsberg's share price as of 7.02.2018, the date their latest annual report (2017) was released. The share price is estimated through a DCF and EVA valuation based on forecast assumptions made through an internal and external strategic and financial analysis of Carlsberg, and the brewing industry. Where the realised results are analysed in comparison to a similar selected peer group. Furthermore, two different strategic scenarios have been constructed to investigate what effects different strategic changes would have on Carlsberg's value.

The beer industry has faced significant challenges in the last decade, with falling consumer demands, volumes, and increasing competition. Contrary, revenues in the industry have been increasing. Where Carlsberg is the fourth largest brewing organisation in the world, as of 2016, with a 6% market share. However, have since 2012 shown a decline in growth and revenues. Where the main reason is related to increasing taxes and political issues in the Russian market, resulting in high impairment of brand losses. Measures to adapt to the changing market conditions and poor performance where taken in 2015, when Carlsberg had a change of management and launched a new strategy (SAIL '22).

The strategic and financial analysis further highlighted Carlsberg's poor performance relative to its peers, but also uncovered improving trends in certain financial value drivers, due to strategic changes. Based on the analysis, and a WACC of 6,135%, Carlsberg is estimated to have an enterprise value of 158,081bn DKK, resulting in an estimated share price of 876,66DKK. A share price that would yield a potential upside of 22,61% from the actual share price on 7.02.2018 (715DKK). Furthermore, the relative valuation shows that Carlsberg's shares are currently being traded at a discount compared to its peers. Either because the analysts are being too pessimistic in their assumptions, or that Carlsberg is subjected to higher risk, and therefore should be traded at a lower value.

The two scenarios, of a potential growth in the Asian market, and improving core operations relative to the peer group average, provided substantial different results. The difference scenarios showed that Carlsberg would increase its value more by focusing on optimising and reducing costs in their core operations, to the level of its peers, relatively to pursuing a market growth in Asia. Strengthening core operations would result in less risks and investments, with higher short term upside potential, based on their current market position.

In perspective it would be interesting to further investigate the questionable changes in the capital structure, as it could be speculated that Carlsberg where to reduce debt to finance future investments.

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1. Introduction and Motivation

The beer industry has faced significant challenges in the last decade, with falling consumer demand, increased competition and a tougher market access, where production volumes and sales in the large markets of the western world have stagnated (Statista, 2016a). The main reason for the stagnation in the industry include change in consumer preferences and the emergence of substitute products, like cider, wine, speciality craft beer (microbrewers) and other health-oriented alternatives (Rutishauser, et al., 2015). In addition, stricter governmental regulations, taxes and a continuing market slowdown have caused problems for the large international brewing companies in the industry. Although emerging markets have shown growth rates and volume increases in recent years, these markets are still dominated by local breweries, causing the large international beer brands to fight for market shares. After previous decades of regular volume growth rates, most of the large brewing companies were not prepared for the challenges that were to follow.

However, seen from the last decade, there has been an increasing trend of larger brewing companies gaining market share through mergers and acquisition. As when Anheuser-Bush InBev (AB InBev), the largest brewing company in the world, acquired the second largest (third largest acquisition in history at the time) SAB Miller in 2016. A deal reported to be worth around 103bn USD. The aim of the acquisition was to explore growth opportunities in the emerging markets of China, Africa and South America, where SAB Miller had a substantial market presence (Nurin, 2016). The new conglomerate (AB InBev) increased the market share to 27% after the merger, with Heineken now the second largest brewing company with a 9% market share (Statista, 2016b).

The challenges and developments in the beer industry, as mentioned above, together with a curiosity in investigating the strategic possibilities for future growth, formed our motivation to choose this as the topic for our thesis. Carlsberg was selected as the ideal company to investigate, due to the considerable challenges the company has faced since 2011, which started when taxes went up by 200% in the key market of Russia. In addition, further restrictions on alcohol set by the government followed thereafter (Borthwick, 2011). Being the fourth largest company in the industry, with a continuing decline in volumes and revenue, shaped an interest in conducting a strategic and financial valuation of the company. In addition to investigate how different scenarios would affect the future performance, growth and value for Carlsberg.

1.1 Problem Statement

The thesis aims to find the intrinsic value of Carlsberg, with regards to the increasing challenges in the market. Where the performance and value will be determined through a fundamental strategic and financial analysis of Carlsberg's historical performance (2011-2017). The cut of date has been set as the 7th of February 2018, the date the latest annual report was released. The purpose of the thesis can be summarised in the following problem statement:

What is the enterprise value and share price of Carlsberg on the 7th of February 2018, and what effect could changing the strategy have for the value of the company?

To support the following problem statement, a series of sub questions have been formulated:

Company and industry overview

- What is Carlsberg's strategy and structure, and how has the company changed over time?
- Which key events have influenced the share price in the past?
- What is the current market outlook for the industry, and what trends are affecting it?
- Who are Carlsberg's main competitors and peers?

Financial analysis

- What is Carlsberg's historical performance?
- How has Carlsberg's profitability developed relatively to its peers?
- What are Carlsberg's key financial value drivers?

Strategic analysis

- What macroeconomic factors affect the industry and Carlsberg's performance?
- Where in the value chain does Carlsberg create value?
- What is Carlsberg's competitive advantage, strengths and weaknesses?

Forecasting

- How will the key value drivers develop in the realistic forecasted period based on the fundamental analysis?

Valuation

- What is the fair stand-alone value of Carlsberg according to the present value approach?

- How sensitive is the valuation to changes in key factors?

Scenario analysis

- How would different changes to Carlsberg's strategy affect the value?

1.2 Theory and Methodology

This section will briefly describe the theories and models used in the thesis, as well as the methods used to gather data. In addition, the delimitations of the thesis will be assessed, before the structure of the thesis will be introduced in the next section. The purpose being, to give the reader a better overview of the structure and methods used when reading the thesis.

1.2.1 Theory and models

The thesis will mostly be based on Petersen and Plenborg's (2012) "Financial Strategic Analysis", with inputs from Koller, Goedhart and Wessels` (2010) "Valuation: Measuring and Managing the value of Companies" in order to supplement information to different sections and approaches. The supplementation is also done to compare different views in conducting the valuation, and to acquire additional information in various theoretical areas. Further academic theories based on literature review of academic papers are used in different sections throughout the thesis, in order to complement the valuation theory in various chapters. Models like Michael Porter's five forces (1979) and value chain analysis (1985), as well as Jay B. Barney's (1997) VRIO framework, are examples of models used in the thesis to better conduct an industry and company specific strategic analysis. A better explanation of relevant theory and models are presented in the sections where it contributes to a better understanding of the topic, but extensive details may be omitted if there is assumptions that the reader is familiar with the models.

1.2.2 Data Collection

The thesis is written from an external analyst perspective, and is based on public available information only. Most of the data used is gathered primarily from Carlsberg's annual reports, form the period analysed (2011-2017), as well as the annual reports from the selected peer companies. In addition, other published reports from the companies, information on their home pages, stock exchanges, other industry reports, and news articles are used to acquire additional information and perspectives. All the information will be cited where it is used and listed in the reference list at the end (Harvard referencing).

1.2.3 Delimitation

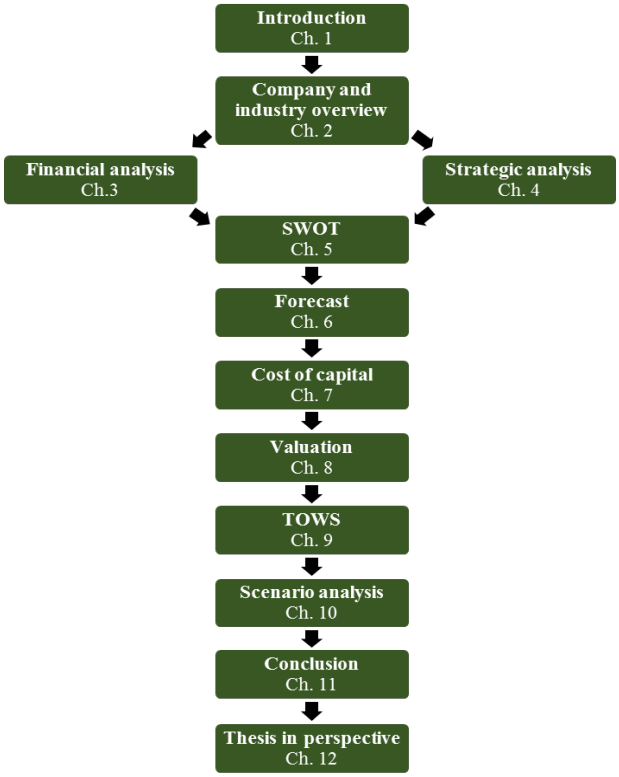
In order to conduct a focussed analysis, and to answer the problem statement mentioned above, some limitations are necessary. Delimitations are necessary due to factors such as time, limited space and the availability of data. Some of the key delimitations are listed below:

- As the thesis is written from an external perspective, including only public information, no "inside" information from the analysed companies are used.
- Due to the limited space, it is expected that the reader does have some knowledge about strategic and economic theory.
- The use of Royal Unibrew as part of the peer group might cause a skewed analysis in some comparisons, as the company's size is substantially smaller than the rest. The analysts are aware of the bias this may lead to, but where the results are substantially affected, this issue is addressed. The inclusion is justified as this will give the thesis an additional perspective of a smaller scale production, and as Royal Unibrew is Carlsberg's biggest competitor in the Danish market.
- The cut-off date has been set to the 7th of February 2018, the date Carlsberg's latest report was realised. No information has been used after this date, except for Heineken's annual report (19 February 2018) and AB InBev's annual report (1 March 2018).
- The thesis is built on estimates, which due to limited space and therefore only will include the variables that are deemed the most relevant in order to answer the problem statement.

1.3 Structure of Thesis

Figure 1 shows the structure of the thesis, which is based on the valuation process proposed by Petersen and Plenborg (2012). Chapter one introduces the reader to the problem statement, motivation and the aim of the thesis, whilst also giving an overview of the theory and models used. Whereas, chapter two will form the basis for the thesis, giving an introduction to Carlsberg's history, structure and strategy, as well as addressing the industry's history, trends and future outlook.

Figure 1 – Structure of thesis
Source: own creation



The main company and industry analysis will be assessed thereafter in chapter three and four. Where Carlsberg's key value drivers will be identified in the financial strategic chapter, which will focus on re formulating historical financial statements, and compare the profitability, growth and liquidity ratios to the selected peer group. The strategic analysis will follow Petersen and Plenborg (2012) suggested top down approach (macro-economic factors, industry specific factors, then company specific factors) to get a better understanding of the overall strategic factors influencing cash flow potential and risk. The discovered information will then be summarised in a SWOT analysis in chapter five.

Carlsberg's forecasted pro forma financial statements will be justified in chapter six, before the required WACC and valuation of the company will be assessed in chapter seven and eight. Based on the information so far, future possible opportunities for Carlsberg to exploit will be assessed through a TOWS matrix in chapter nine. In chapter ten, the discovered opportunities will form the alternative scenarios of potential changes in Carlsberg's strategy. The thesis will be summed up in the conclusion, before looking at the thesis in perspective thereafter.

2. Company and Industry Overview

This section of the thesis will focus on introducing Carlsberg and the beer industry. By presenting Carlsberg's history and development, products, key markets, strategy and structure. In addition, an introduction of the beer industry will be presented, where the structure and developments of the market will be explained. Trends and events that might influence the future growth of the industry will be discussed, together with a justification of the selected peer group. This information will form the basis of the strategic analysis in chapter four of this thesis.

2.1 Company Introduction

Carlsberg is one of the leading brewing organizations in the world today, with a large portfolio of beer products and other beverages. Today more than 41.000 people work for the company and their products are sold in more than 150 markets worldwide (Carlsberg, 2018a). In 2017 Carlsberg presented a net revenue of 61,8 DKK, (Approx. 9,5 billion USD) (Carlsberg, 2017a), resulting in a 6% market share and the fourth largest company in the global beer market (Statista, 2016b).

2.1.1 History

Established in 1847 by brewer J.C. Jacobsen right outside of Copenhagen in Denmark. He took the name of his five-year-old son Carl and combined it with the Danish word for hill "bjerg" resulting in Carlsberg. International approval came not fewer than 21 years later in 1887, when the first Carlsberg beer was exported to Great Britain. The first 100 years of the company was mostly focused on perfecting the Carlsberg beer and brand that we know today, with the focus on growing its market share domestically. Since the company's establishment in 1847, Carlsberg opened its first overseas brewery's in 1968 and hereafter was listed on the Copenhagen stock exchange in 1970. In the following period, Carlsberg increased popularity internationally and in 1976, sales of Carlsberg and Tuborg exceed domestic sales significantly. Carlsberg continued to grow throughout the 1990´s as the company increased its degree of ownership in breweries abroad (Carlsberg, 2018b). In 2016 Carlsberg launched a new company strategy called SAIL`22 in order to secure the company's future growth. This strategy will be presented later in this chapter.

2.1.2 Products

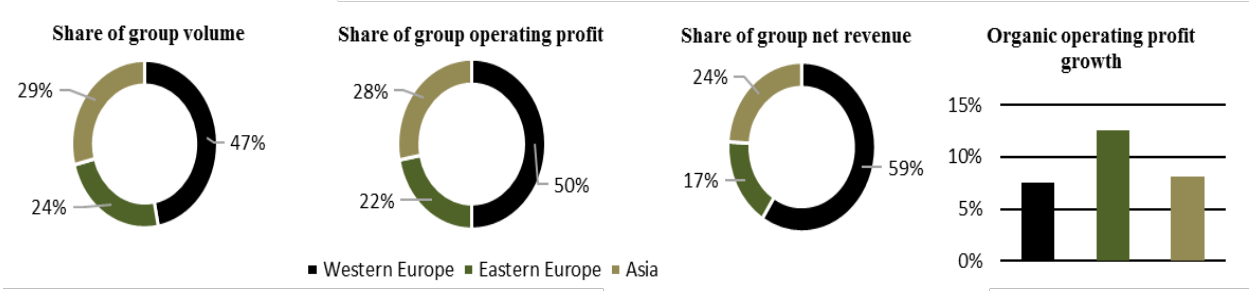
Carlsberg's core beer products consist of Carlsberg, Tuborg and their strong local power brands that accounts for 92% of the total beer volumes sold (Carlsberg, 2017a). Carlsberg categorise their products

into four different groups. International brands such as Carlsberg, Tuborg, 1664, Grimbergen and Somersby. Local power brands consists of brands such as Ringnes in Norway, Feldschosse in Switzerland, Chongqing in China and Baltika in Russia. The last two products groups are craft and speciality, and alcohol-free brews.

2.1.3 Key Markets

Carlsberg has a strong market position in 25 markets across Europe and Asia, where they either being market leaders or secondary in the market (Carlsberg, 2017a). Figure 2 shows a total breakdown of the company's total volume, operating profit and net revenue divided by the three key markets. Additionally, all the three key markets show a positive organic operating profit growth for 2017.

Figure 2 – Carlsberg's key market breakdown
Source: own creation, based on (Carlsberg, 2017a)



2.1.3.1 Western Europe

Carlsberg Group is the second largest brewer in the western European market, where the total beer market volumes amounted to approximately 250m hl in 2017. The western market accounts for the largest part of the group's sales volume (63,2m hl), share of operating profit and net revenue. The group's presence in this area is particularly strong, especially in the central and northern parts of Western Europe, being market leader or secondary to. Carlsberg is hereby dominating markets such as Norway (54%), Denmark (54%), Sweden (34%), Switzerland (41%) and Portugal (47%). Even though the western markets are mostly mature markets with stagnating sales of traditional lager beers, Carlsberg is experiencing a growing interest in craft and speciality beers, as well as alcohol-free beer alternatives. Carlsberg has realised a decrease in revenues by 3% in Western Europe in 2017, mostly due to disposal of a German wholesaler and negative currency impacts (Carlsberg, 2017a). However, as shown in Figure 2, organic operating growth increased by 7,5%.

2.1.3.2 Eastern Europe

The eastern European markets importance for Carlsberg has decreased significantly in recent years, but still amounts to 24 per cent of total volume sold (31,7m hl). Figure 2 shows that in 2017 the market only amounted to 22% of the company's total operating profit, this compared with 45% in 2010. Even though revenue (before excise duty) decreased by 1% due to an 8% volume decline, net revenue grew by 7%, due to a positive currency impact in Russia. Despite the volume decline in the region, organic operating profit grew by 12,2%, as a result of a substantial price increases from introducing smaller beer pack sizes in Russia, following alcohol restrictions (PET) implemented by the Russian government (Carlsberg, 2017a). Russia's total sales market volume amounts to approximately 100m hl in 2017, and is the sixth largest beer market in the world. This is one of two main markets for the group in the region. The Russian market accounts for 8,052bn DKK of the company's total revenue, which amounts to 67% of Carlsberg's business in the Eastern European market, a total of 17% of the company's overall operating profit is generated there. The Ukrainian market is the other main market for Carlsberg with 20% of the business in the area (Carlsberg, 2017a).

2.1.3.3 Asia

The market's importance to Carlsberg has increased significantly during the past decade, and the company has increased its presence both organically and through acquisitions. The Asian beer market amounted to approximately 560m hl in 2017, with China being the largest market. Asia accounts for 29% (38,4m hl) of Carlsberg's total volume sold (133,3m hl), where 55% of the products sold in the Asian market is related to China (7,1bn of total revenue sold for Carlsberg). Furthermore, profits in China amounted to 35% of the total 28% the company had in operating profit in the area **(**Figure 2). Net revenue decline by 1% in Asia because of negative currency impacts in China, Malaysia, Laos and Vietnam, but organic operating profit grew by 8,1% due to premiums and supply chain savings (Carlsberg, 2017a).

2.1.4 Carlsberg's Structure

This section will briefly explain Carlsberg's ownership structure, investment model, and their business model.

2.1.4.1 Ownership structure

As of December 31st 2017, Carlsberg's largest shareholder was the Carlsberg foundation with 30% of the capital and 75% of the votes (Carlsberg, 2017a). The remaining ownership is divided between several independent shareholders (free float), who hold 70% of the capital and additionally 25% of the votes. The

independent shareholder base is geographically split between United States (43%), Denmark (18%), UK (18%) and other places (21%). Hereof, Massachusetts financial services company (MFS) being one of the larger shareholders, holding shares exceeding 5% of the share capital (Carlsberg, 2018c).

2.1.4.2 Investment model (Joint ventures and Associates)

Carlsberg's investment strategy, when entering new markets, is often in collaboration with a local partner through different entry modes, which affects the financial statements in different ways. Entering a market with a partner can reduce the risks and financial exposure depending on the investment mode. Carlsberg has used a few different investment strategies in the past. One strategy; entering as a non-controlling shareholder by providing knowledge and financial support. Another mode is through either a joint venture or associates, where Carlsberg shares the responsibility with a local partner regarding operational, strategic and tactical decisions. The total investments in joint ventures and associates amounted to 4,3bn DKK in 2017, generating a profit of 262m DKK in the two markets where this mode is used (Western Europe 182m DKK and Asia 49m DKK). Joint ventures agreements with the five Chines breweries amounted to only 10m DKK of the profit, the rest came from associates. Investments in joint ventures and associates are realised in the financial statements using the equity method[1], where risk is limited to the investment. However, Carlsberg's most common investment strategy is through foreign direct investment (organic growth), where the company has full management control and majority of voting rights in the venture. These investments are realised in the financial statements as part the company's core operations (Carlsberg, 2017a).

2.1.4.3 Carlsberg Business model

The business model varies slightly between markets, with a main purpose of providing a sustainable and cost-efficient model that supports the company's strategic priorities. Priorities aiming to be successful, professional and attractive in the key markets. Carlsberg's value chain consists of five main stages: sourcing, brewing & bottling, distribution, customers and consumers. (1) Sourcing is handled by a central procurement function Carlsberg Supply Company (CSC) that buys all the raw materials (malted barley, sugar, hops, etc.) to produce the beer; this is done to optimise procurement and cost-efficiency. Carlsberg also invest in own barley production and is a market leader in the research on malting barley. (2) Carlsberg has brewing facilities in more than 35 markets in order to produce a steady supply of products. (3) Distribution varies from direct to indirect to costumers. (4) The customers range both from wholesaler

[1] Investments in joint venture are not accounted for as part of the company's core operation, but are allocated as a separate

to bars and varies in size, whereas (5) consumers are served in more than 150 markets worldwide (Carlsberg, 2017a). The value chain will be further analysed in chapter four.

2.1.5 Strategy: SAIL '22

In March 2016, Carlsberg launched a new strategy with the desire to delivering sustainable growth, being the preferred supplier and delivering value for shareholders, employees, and the society. The new strategy SAIL'22 was developed in order to leverage the company's vast knowledge base, support a team based culture and secure fast implementation. The key strategic choices are grouped under three main goals; (1) Strengthen the core, (2) position for growth, and (3) Create a winning culture. The aim being to deliver added value for the company's shareholders through organic growth in operating profit, improve ROIC by improving earnings and reducing invested capital, and investing in growth through optimal capital allocation (Carlsberg, 2016a). This section will serve as an introduction to Carlsberg's strategy that will be further analysed in chapter four.

2.1.5.1 Strengthen the core

Under this grouping, Carlsberg has three main objectives; (a) leverage our strongholds, (b) excel in execution and (c) funding the journey. The first objective (a), to leverage the strongholds is divided into two priorities, which are to revitalise core beer products and to transform the business in Russia. As the core beer brands account for 92% of the total beer sold, revitalising will leverage the strong beer brands and their market positions, which will drive growth and improve margins. Transforming the business in Russia consists of changing the brand to meet consumer needs. The second objective (b), excel in execution implies to improve quality, impact and efficiency in the value chain. The last objective (c) is funding the journey to bring together a single programme of individual programmes designed to save costs and improve profit. The programmes consist of four main areas in order to save costs: value management, supply chain efficiency, operational expense efficiency, and right size of businesses. The goal is that this initiative will deliver net benefits of 1,5-2bn DKK by 2018 (Carlsberg, 2016a).

2.1.5.2 Position for growth

The strategy for growth in SAIL'22 is to grow in three main areas. First, to grow in the two product groups craft & speciality and non-alcoholic beer. These product groups' accounts for 5% of the beer volume sold at the time of implementation, and is expected to double in size during the course of SAIL'22. Secondly, to target big cities and improve the company's global presence. By 2050, it is expected that 70% of the world's population will live in big cities, where beer consumption is estimated to

exceed the average by 30%. The third and last growth strategy is focused on growth in Asia, which accounts for 40% of the world's beer consumption. As mentioned before, currently 28% of Carlsberg's operating profit is generated in the region (Carlsberg, 2016a).

2.1.5.3 Create a winning Culture

In order to create a winning culture SAIL'22 focuses on three areas, to foster team-based performance, contribute to a better society and to live by our compass. "Foster team-based performance" will reward high-level performance based on a triple A system (alignment, accountability and action), which will create a strong sense of ownership and accountability to deliver results. Carlsberg wants to "contribute to society" by having a greater focus on the growing role of sustainability. "To live by our compass" entails that the employees should possess integrity, responsibility and ethical values in line with the core values, policies and rules of Carlsberg (Carlsberg, 2016a).

2.1.6 Share Price Development 2011-2018

This section looks at Carlsberg's share price development (Figure 3), and how a few key events have affected the share price in the analysed period from January 2011 to the cut of date, 7 February 2018. Carlsberg is listed on Nasdaq Copenhagen with 39,000 registered shareholders as of 2017 (Carlsberg, 2017a). Carlsberg started the analysed period (2011) with a share price of 562 DKK and ended the period at the 7 February 2018 with a share price of 715 DKK, an increase of 27,22 % over seven years (Carlsberg, 2018d).

Figure 3 – Share price development of Carlsberg 2011-2018
Source: own creation, based on Carlsberg's share price (Carlsberg, 2018d)

August 2011: Shares decrease manly because of 200% increase in taxes on alcohol in Russia (The Guardian, 2011).

August 2014: Shares fall 5% due to the Ukraine conflict warning (Chester, 2014).

July 2015: Significant decrease in share price, due to high impairment losses in the Baltika brand in Russia and impairment losses in China. In addition, change to a new management played a part in the decrease (Zawadzki, 2015).

July 2017: Shares decreased by 3,9% because of the PET ban on plastic bottles at the beginning of the year in Russia. Competitors began discounting prices, whiles Carlsberg increased prices by changing to smaller packaging to sustain profitability, resulting in a 5% drop in market share (Buckley, 2017).

January 2018: Carlsberg share price reaches an all-time high for the period of 770 DKK (Carlsberg, 2018d).

2.2 Industry Overview

In the following section the history of beer, definition of products and trends in the beer industry will be presented. Furthermore, data from multiple reports will be discussed and presented to form a market outlook. Additionally, a peer group will be selected according the suitable criteria for the purpose of the forthcoming analysis.

2.2.1 History of Beer

Consumption of beer has been around for a long time. Scientists have dated usage of beer all the way back to the agricultural revolution 10.000 years BC, where remains of different varieties of fermented drinks, based on hops, were discovered in different locations all around the world. Throughout time, beer has been used in many different cases like spiritual and ceremonial purposes, experimental medicine and substitute for contaminated drinking water. Beer has been a part of the development of most societies around the world and is still finding its use today. Since most societies have access to clean drinking water, most people connect beer with celebration, gastronomy and as a legal intoxicant (Anderson & Baumberg, 2016). Beer is the world's fourth most consumed beverage, only surpassed by water, tea, milk and juice (Statista, 2016c). With an 8% share of all beverages consumed worldwide, many companies have sought to exploit the opportunity to produce and supply beer to local communities. Since beer can be produced in many different ways, it is easy to differentiate the products, and today the number of various brands has grown to approximately 300.000 worldwide (Meussdoerffer, 2009).

2.2.2 Product Segmentation

Today beer can be found in more than a hundred varieties (Meussdoerffer, 2009). However, the studied peer group for the thesis generally classifies beer in to four main segments; Lager, Non-alcoholic, Cider and Craft beer (AB InBev, 2017; Carlsberg, 2017a; Heineken, 2017).

The difference between lager and craft beer segments can be found in the approach to consistency of production. Lager breweries are known for producing consistently the same beer with no variation throughout its long product cycle, whereas craft breweries are producing a variety of beer products under the same brand with shorter product cycle. Additionally, the craft breweries are experimenting with alternative methods in the brewing process, like not only using processed hops, but also adding additional flavours by expanding recipes (Morvan, 2016).

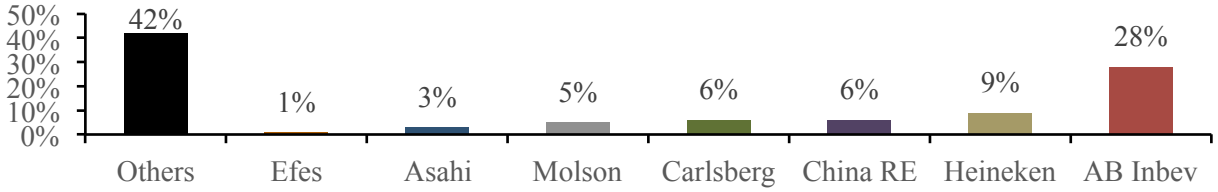
Since the lager beer segment includes almost all beer produced, it is the largest segment in the peer group´s product portfolios, followed by newer segments such as craft beer and cider (Carlsberg, 2017a). Non-alcoholic, craft beer and cider are growing segments for the major beer companies, due to new consumer preferences. Carlsberg states in the latest annual report (2017a) that both craft and non-alcoholic beer segments are increasing significantly every year. Heineken on the other hand is experiencing an increase in the cider segment, which has become a significant segment in their product portfolio (Heineken, 2017). Furthermore, AB InBev (2017) states that they experiencing a decrease in sales of lager beer, where their premium and premium light beer products, such as Budwiser and Budlight, are underperforming (Nurin, 2017). The increase in sales of craft beer together with the decrease in sales of premium lager has been on-going for more than a decade, which is an important factor when understanding the development in the beer industry (Weissman, 2014).

2.2.3 Industry Structure, Markets and Development

Throughout the history of beer, local breweries have customised and supplied their beer to suit the local community's preferences. During the 20th century, technology improved the brewing process and logistics, which meant that breweries could sell larger quantities and expand from their local markets (Meussdoerffer, 2009). Because of this, supply of beer increased more than the demand. Breweries were competing for market shares, which eventually resulted in mergers and acquisition throughout industry. The merger in 1987 between the two largest beer companies in Belgium; Artois and Piedboeuf was the beginning of a new era, where a few major brewery conglomerates would dominate the beer industry.

Today the beer industry is dominated by five companies, which all together are in control over hundreds of beer brands.

Figure 4 – Global market share of leading beer companies
Source: own creation, based on (Statista, 2016b)



In Figure 4 the largest company is AB InBev. As described in the introduction of the thesis, AB InBev acquired the second largest company in the industry in 2016, SAB Miller, which furthermore increased the gap to the rest of their competitors. Although AB InBev is the largest beer conglomerate in the world, the beer is mostly distributed in the United States where the company in 2016 has a 48% market share (Forbes, 2017). The second largest beer conglomerate in the North America is Molson Coors (MC). Due to the company's Canadian roots, MC has the largest market share in Canada. In Western Europe, the dominating beer conglomerates are Heineken and Carlsberg. Both companies are still pursuing the old traditions of brewing beer and are competing for the western European market. Outside of Western Europe, Carlsberg has a large operation in Eastern Europe and especially Russia, whereas Heineken is focusing on the African markets (Carlsberg, 2017a; Heineken, 2017).

Since the large companies are fighting for market shares in all western countries, an emerging market is growing in the east. It is estimated that the market will grow with a CAGR of 7,5% until the year 2020 (Bisht, 2015). This significant opportunity can secure the major beer companies an additional growth. The interest in the Asian Pacific (APAC) has been increasingly mentioned in all the annual reports of the peer group from the period of 2011-2017, where Carlsberg, Heineken and AB InBev are likely to pursue the venture (Carlsberg, 2011-2017, AB InBev 2011-2017, Heineken, 2011-2017).

2.2.4 Future Trends in the Beer Industry

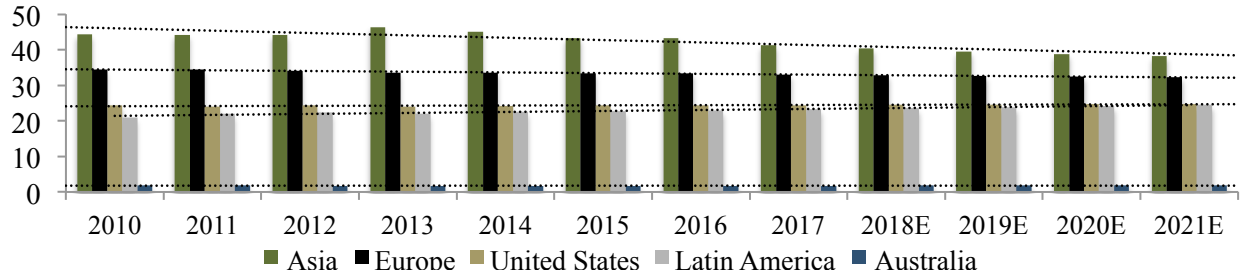
Due to the fierce competition in the market and the stagnation in sales of lager, the beer companies will have to adapt to new strategies in order to develop the businesses and stay competitive. The former strategy, where major beer companies were obtaining market shares through foreign direct investments (FDI), in order to create economies of scale, has become more difficult due to regulations and the fear of losing brand identity (Rankin, 2014). It is expected that an increasing growth in the craft beer segment will

change the beer industry. Before the rise of craft beer, the industry was focusing on economies of scale, by concentrating on optimisation and standardisation to decrease the average cost of beer produced. This resulted in a low diversity in the beer industry, since minor companies, brewing craft beer and local specialities, were either acquired by major companies or outcompeted. Since the market is based on consumer preferences, and consumers like variety, it conflicts with economies of scale and standardisation products (Metzger, 2011). This is evident when looking at Carlsberg's annual report, where mainstream lager has experienced a growth of 3%, compared to the craft beer segment, which has experienced a growth of 29% since 2016 (Carlsberg, 2017a). The new trend in consumer preferences has opened the market for craft beers, where microbreweries are able to compete against major brands, due to their advantage of authenticity (Morvan, 2016).

2.3 Market Outlook

To provide a perspective of how the beer industry has developed over time, it is interesting to investigate the development of the volume sold in significant markets. The following graphs are reconstructed from the report; ***Alcoholic Drinks Report 2017 – Beer, Statista Consumer Market Outlook – Segment Report*** (Brinckmann, 2017).

Figure 5 – Volume of beer sold in various markets (billion)
Source: own creation, based on (Brinckmann, 2017)



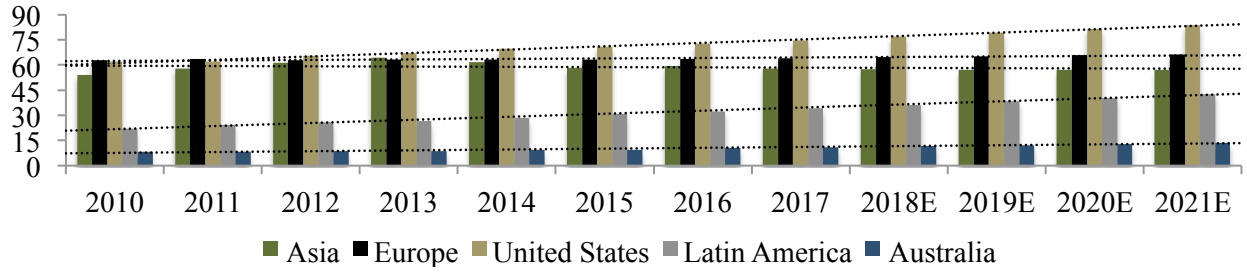
As shown in Figure 5, the largest volume of beer is sold in the APAC region, compared to the rest of the markets. This said the Baltic countries including Russia are not included in numbers for Europe. As described previously, Carlsberg includes Russia in the eastern European market, which is different from the data provided by Statista. Including Baltics and Russia in the statistic would present the European market as the largest.

When looking at the development in the various markets, it is evident that the trend for beer volume is decreasing or stagnating in the largest beer markets such as APAC, Europe and the United States. These

markets, which represent approximately 80% of the total sales of beer worldwide, illustrates an overall trend in the beer industry. However, markets such as Latin America and Australia are growing in sales volume. Compared to the stagnation in the major markets, this growth is comparably insignificant, but could indicate areas of market potential.

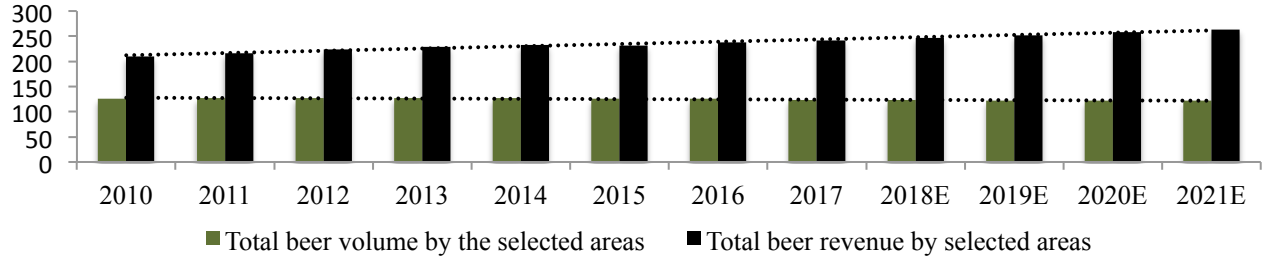
Though the development of beer sales is overall decreasing in most markets, the revenue generated from the same markets shows a contradicting trend, which is seen in Figure 6. All markets, except for APAC, have previously experienced and forecasted an increase in overall revenue. The contradicting development in the decreasing sales volumes and increasing revenue could be an indication of a change in the beer industry.

Figure 6 – Revenue of beer sold in various markets (billion)
Source: own creation, based on (Brinckmann, 2017)



The main reason for the increase in prices, expressed by MC, AB InBev and China Resources, is due to an increase in the costs of raw material and at the same time increase in variety of the costs (Sutton, 2018). The increase in variety of costs could be explained by the demand for variety in beer products mentioned in 2.2.4. Producing more variety of beer is not optimal when pursuing economies of scale, which eventually will increase the product costs. Carlsberg, AB InBev and Heineken also observed this tendency in the annual report for 2017 (AB InBev, 2017; Carlsberg, 2017a; Heineken, 2017).

Figure 7 – Total beer volume sold (in bn. hl.), and total revenue (bn. USD)
Source: own creation, based on (Brinckmann, 2017)



When looking at both graphs comprised as an overall outlook of the industry in Figure 7, it is evident that the industry is facing a change. Generally, beer is becoming more expensive for the consumer and at the same time consumers are consuming less. Since beer has an average elasticity below one, the increase in beer prices should have an inelastic effect on the change in consumption of beer. This means that though beer prices increase it does not have an effect on the volume sold (Nelson, 2013). The inelasticity could indicate that substitute products could play a role in the decrease of consumption of beer worldwide. This will be more deeply analysed in chapter four.

2.4 Peer Group

Petersen and Plenborg (2012) describes that a peer group should consist of comparable companies within the same industry. Although, companies in the same industry can be still be significantly different. Some companies are larger than others are and usually operate in different geographical markets, which results in different risk structures. Furthermore, it is important that the companies' financial reports are based on the same accounting principles (Petersen & Plenborg, 2012). The consultant firm Meridian Compensation Partners (2011) (MCP) states that it is unlikely to have a uniform peer group, as companies are able to differentiate from each other in order to create more value. In addition, MCP describes that suitable companies in a peer group should represent organisations that a company attracts talent from and loses talent to. Another essential key element in the selection of a peer group is that the peers have similar business models, which integrates the same core value creating activities in their value chains (Zacks, 2018).

Since Carlsberg´s competitors are major brewing companies, these companies would form the logical peer group. Some of the largest beer companies are a part of food & beverages conglomerates, which makes it difficult from the lack of information to distinguish the beer operations from the rest of the company's operation. This excludes large beer producers such as Asahi and China resources group from being a part of the desired peer group. Additionally, other significantly larger beer companies are excluded because they are either a part of a joint ventures or an affiliate company that is not operating independently. Lastly, not all of the major beer companies are publicly listed, which means that the information available is limited. Based on this, it was decided to construct a peer group for analytical purposes in this thesis consisting of Carlsberg and three other companies, AB InBev, Heineken and Royal Unibrew.

Royal Unibrew is the second largest beer company in Denmark and operates both domestically and globally. The company owns around 15 beer brands, but despite the small size of the company, it

competes with Carlsberg in the same markets. Royal Unibrew had a turnover of 6,4 billion DKK in 2017 (Approx. 980 million USD) (Royal Unibrew, 2017). Royal Unibrew has had success over a number of years in generating efficiency across their value chain in order to improve the financial results and to ensure a good competitive position in their markets (Royal Unibrew, 2018). The company's value chain consists of seven stages (raw materials, brewing, fermentation, bottling, transportation, end user and waste). Royal Unibrew outsource their input activities to external suppliers, agricultural (raw material) and malting responsibilities, but do not support their suppliers economically in improving efficiency or technology. In the company's production process, they create value in the value chain through reducing water, waste and energy usage. They have made substantial new investments in new process equipment and production facilities to improve efficiency and cost reduction. There is also a strong focus on value management and cost reduction in their packaging, through investments in new bottling equipment and recyclable packaging. Royal Unibrew produce its beer at four production facilities in Europe, but distributes and sells from an additional nine. When it comes to distribution and sales, the company is working on optimising the transportation to improve value. The company has already scaled up sales and marketing efforts with a view to increase total product volume sold (Royal Unibrew, 2017).

Heineken is the second largest company in the beer industry with a global market share of 9%. The Heineken family owns 52% of the company, which is comparable to the ownership structure in Carlsberg. Heineken consists of more than 250 brands, with its main presence in Europe and Africa. The company has also grown its market share by strategically acquiring other companies. Heineken had a turnover of 21,8 billion EUR in 2017 (Approx. 27 billion USD). Heineken creates value through a value chain consisting of seven stages (agriculture, malting, brewing, packaging, distribution, costumer and consumer). The company works closely with their farming suppliers to improve quality and sustainable supplies, where the raw materials are outsourced but the malting is handled within the company. The production process is an essential part of the company's production, as they have over 170 breweries, malting facilities and other facilities across the world. Heineken has a major focus on increasing water and energy efficiency (renewable energy sources) in the process. IT systems are also in place to effectives and share good practises between all their breweries. Packaging is also done in house, with a focus on reducing waste and optimising production through changing design and recycling waste into new products. Distribution is done locally by Heineken in each country where the product is produced, which limits impact on transportation. Heineken educate their drivers and constantly re-assesses their distribution networks to improve value. Sales and marketing is focused on innovative marketing in the digital world to gain market share, through effective marketing and strong sales execution (Heineken, 2017).

AB InBev is the largest beer company in the industry, as stated in Figure 4, controlling 27% of the market shares. The company consists of more than 400 different beer brands with a market focus in the Americas, and are now looking to expand to the APAC. The company has become market leaders due to an aggressive acquisition strategy, where the company has acquired some of the largest beer companies in the industry, such as Interbrew, SAB Miller and Grupo Modelo. AB InBev had a turnover of 56,4 billion USD in 2017. AB InBev's value chain consists of five stages (agricultural, water, energy, packaging & waste, and retailer development). The company supports and engages with the farmers and small retailers in their agricultural stage, thereby being more productive and produce better quality of barley and other raw materials. The core production activities of malting, brewing and packaging are all done in-house. AB InBev creates value through reduction in water usage, waste, investments in technology and purchasing energy from renewable sources (windmill). The investments in renewable energy alone are predicted to save enough to brew 20bn 12-ounces of beer. AB InBev conducts distribution of products, with an aim to reduce energy and use GPS systems, to track fuel and rout efficiency. Sales and marketing is focused on aggressive marketing of their products in key markets (AB InBev, 2017).

2.4.1 Choice of Peer Group Conclusion

As the peer group has to consist of similar companies with similar financial reporting standards and policies, we have limited the peer group to these three companies. Although Royal Unibrew is a significantly smaller company than the rest of the selected peer group, it has been included since it is Carlsberg's closes competitor in the Danish market. When including a smaller company, it is interesting to examine how its smaller scale production is compared to the larger companies. This will give the analysis an extra perspective. Figure 8 shows that Carlsberg, Royal Unibrew, Heineken and AB InBev all integrate the same value creating activities in their operation. Although Royal Unibrew is less involved in the operations of the suppliers of raw materials, it is still internalising the core operations. Overall, the peer group consists of peers that give a good representation of the industry, where the peers cover similar segments and markets as Carlsberg.

Figure 8 – Value chain comparison of peer group (integration of core activities)
Source: own creation, based on peer group (AB InBev, 2017; Carlsberg, 2017a; Heineken, 2017; Royal Unibrew, 2017)

	Agricultural	Malting	Brewing	Packaging	Distribution	Sales and Ad
Carlsberg	×	✓	✓	✓	✓	✓
Royal Unibrew	×	×	✓	✓	✓	✓
Heineken	×	✓	✓	✓	✓	✓
AB InBev	×	✓	✓	✓	✓	✓

3. Financial Analysis

This chapter will focus on Carlsberg´s financial statements (annual reports) to better understand the company's current financial position and its historical performance. The aim will be to identify Carlsberg´s financial value drivers by analysing the historical data of the company's operations. The financial analysis will assess Carlsberg´s accounting principles and quality, before reformulating the income statement and the balance sheet for analytical purposes. Based on the reformulated statements, a cross sectional profitability, liquidity and growth analysis compared to the peer group will be conducted. This, to better identify and highlight the key operational value drivers of Carlsberg. The financial analysis together with the strategic analysis in the next chapter will identify Carlsberg´s key operational value drivers that will be summed up in the SWOT analysis.

3.1 Accounting Principles

Carlsberg´s financial year runs from January 1 to December 31, and the companies consolidated financial statements have all been prepared in accordance with International Financial Reporting Standards (IFRS) as adopted by the European Union (EU), and additional requirements in the Danish Financial Statements Act (Carlsberg, 2017a). On January 1 2014, Carlsberg had a change in accounting policies from the implementation of IFRS 10-12, which stipulates a change in the consolidation method for investments in joint ventures (International Accounting Standards (IAS) 27-28). The implementation of IFRS 10-12 and the adjustments to IAS 27-28 affected Carlsberg´s financial statements and segments, as entities that were previously proportional consolidated are now accounted for using the equity method (Carlsberg, 2014). After the changes in policies, previous year's financial results have been restated in newer reports for comparisons in the five-year summaries. As the accurate changes in accounting item numbers are not available for those reports and are not large enough (2013: 2m DKK, and 2014: 110m DKK), the analysis in this thesis will focus on realised accounting numbers for the years in the respective annual reports.

3.2 Accounting Quality

In assenting the accounting quality of a company there are different definitions on what good accounting quality in financial statements are, and how they should be analysed to better understand the company´s performance. Kamal Naser (1993) defines good accounting quality as financial statements that provide an objective (neutral) picture of a company's financial position and is free of manipulation. While Penman (2013) uses earnings quality as an indicator of good accounting quality of financial statements, where the

quality of earnings is the degree to which current earnings serves as an indicator of future earnings. In his definition, permanent items are characterised as having high quality, whilst transitory items are considered of lower quality. Petersen and Plenborg (2012) argues that good accounting quality has a broader view, and that the analyst should keep in mind the purpose of the analysis and the decision model applied before assessing the quality. An annual report that enables users to make rational economic decisions is regarded as having high quality.

Carlsberg uses a two linked statements system to display the comprehensive income in the consolidated income statement, and all financial statements are presented in Danish Kroner (DKK). Assets and liabilities measured or disclosed at fair value are categorised within the fair value hierarchy[2]. Significant items are presented individually in the financial statements as required by IAS 1 (Carlsberg, 2017a). Another important indicator of quality of data in the annual report according to Petersen and Plenborg (2012) is the auditor's report. Throughout the analysed period from 2011 to 2017, Carlsberg´s external auditor has been KPMG for the first six years and PwC for the last year. Throughout the entire analysed period both companies write in their independent auditor report that in their opinion the financial statements give a true and fair view of Carlsberg´s financial position and results, and in accordance with IFRS, and additional requirements in the Danish Financial Statements Act (Carlsberg, 2011-2017).

As Petersen and Plenborg (2012) comments on the purpose of the accounting, the analysts of this thesis are aware that the public reporting can purposely be used as a tool of communication, which deliberately provides the company with the power to selectively focus or leave out information in various areas. When reading the annual rapports from Carlsberg it is evident that there is a significant focus on value creation for shareholders. Here the focus is shifted towards areas of high performance, where other areas left out. Furthermore, Carlsberg provide little information regarding debt, other than commenting on the overall leverage, ability to pay back debt and strategy for capital structure. Information about the company's debt structure, debt limits and credit terms are not revealed, which is essential information to understand the company's presented strategy for capital structure. With this in mind, the analysts understand to have a critical approach to information issued by Carlsberg, since it could be skewed by the company's hidden agenda. Based on the change in accounting policies, and the analysts' critical approach to available information, we believe that the quality of Carlsberg's financial statements are valid and can be used in the analysis.

[2] Asset and liabilities are valued based on the market value "exit price", rather than a entity specific measurement (IFRS, 2014)

3.2.1 Potential Red Flags

Red flags are various issues and problems that might occur when carrying out the financial analysis (Petersen & Plenborg, 2012). One of the issues in the financial statement analysis of Carlsberg is as mentioned earlier, their change in accounting policies. Policies related to changes in reporting of investments in joint ventures. Where the actual realised numbers in the given annual report for the year are used, as detailed information on the reallocation of items is not available. Another potential red flag is when Carlsberg had a change of management in June 2015, when they appointed Cees´t Hart to replace Jørgen Buhl Rasmussen as CEO. At that time Carlsberg was having increasing challenges in market conditions in Russia and China, which led the new management to reassessed (impairment test) those markets in the autumn of 2015. The result was that Carlsberg incurred significant impairment and restructuring costs, which amounted to 8,7bn DKK (Carlsberg, 2015). This action by the new management can be speculated as to have taken a "big bath". Petersen and Plenborg (2012) describes big bath accounting as a process where a company writes down certain assets or recognises large restructuring costs in a single year, to improve future years earnings. Whereas it is often used in years when sales are down as a result of external factors or after a change in top management.

There are also a couple of potential red flags, when comparing Carlsberg to the peer group. All the companies analysed in the group have statements that have been prepared in accordance with IFRS. Heineken classifies expense items by nature and not function like the rest of the peer group. The difference in classification might cause difficulties in comparing trend analysis between Heineken and the rest. One example of this is the classification of depreciation and amortisation expenses, where Heineken reports it as a separate item in the income statement, while the others include it in several accounting items. AB InBev also has an unusual transitory item of a positive fair value adjustment in 2013, amounting to 6,410bn USD that might cause problems when carrying out the comparison.

3.3 Financial Statement Adjustments

In order to identify Carlsberg´s key value drivers and calculate financial ratios to measure the company's profitability, it is beneficial to separate operations and investments in operations from financial activities. The reason to separate operating items from financial items is that the company's operations is the primary driving force behind value creation, and is also what makes a company unique and different from their competitors (Petersen & Plenborg, 2012). When determining the period of an analysis, a products business cycle is often used. Where it is often suggested that a historical financial statement analysis

should at least cover a five-year period, but in assessing the quality of the company's business model it is often a good idea to examine operating earnings over an even longer period of time (Petersen & Plenborg, 2012). Freeman (2001) states that alcoholic beverages generally, and beer specifically, have long been viewed by the investment community as products mostly immune to the business cycle. "The quantity of alcoholic beverages that a nation consumes tends to remain steady during periods of both recession and prosperity" (Standard & Poor, 1998). A statement that is consistent with the results of Blake and Nied´s (1997) findings that beer consumption increases with income and industrial production, but also increases in unemployment. Based on this information, combined with the evidence that Carlsberg have had to impair great impairment losses in recent years, the analysis will be conducted over a seven-year period (2011 to 2017) in order to attain a more accurate picture of the company's operations and performance.

Most of the items in the financial statements will be self-explanatory, but the rest of this section will provide argumentation for the items of Carlsberg that need justification to classify them as either operational or financial. As all the companies analysed in the rapport, all have very similar items and operate in the same industry, the adjustments will be mostly the same, but some deviation in item names among the investigated companies are noticeable. All classifications will be done with regard to Petersen and Plenborg (2012). The analytical income and balance sheets for all the companies analysed in this thesis will be presented in (Appendix 3-5), and will provide a separation of operational and financial activities for each company.

3.3.1 Income Statement Adjustments

Tax: The corporation tax in the income statement relates to both operating as well as financial activities. As the focus is on operating activities the tax expenses needs to be divided between the two, and tax benefits from financial activities needs to be isolated from operational activities (Petersen & Plenborg, 2012). The effective tax rate is used instead of the marginal for Carlsberg and the rest of the peer group. This because all the companies in the peer group except for Royal Unibrew have large foreign operations in countries with different tax rates. Carlsberg operates in a large number of tax jurisdictions where tax legislation is highly complex and subject to interpretation (Carlsberg, 2017a). For Royal Unibrew the effective tax rate is close to the nominal in Denmark of 22% (KPMG, 2018), so the effective tax rate will also be used here to not differentiate between the companies. The effective tax rate is a proxy, where all of the company's taxes are included and divided by the taxable income, and is estimated by taking the corporation tax divided by Earnings Before Interest and Tax (EBIT).

Share of profit in associates: Carlsberg classifies share of profit after tax from associates as part of operating profit before special items, where most associated companies are involved in brewery-related activities (Carlsberg, 2017a). This supports the idea that it should be classified as part of operating profit. Since share of profit in associates is on an after tax measure, we need to calculate the tax on profit from associate. As the associates also are located in foreign countries, the effective tax rate is also used here to calculate the tax.

Depreciation, Amortisation and Impairment losses: Carlsberg recognises depreciation, amortisation and impairment losses in the function to which they belong in their income statement. In the notes of the annual report, these costs are split between cost of sales, sales & distribution, administrative expenses and special items (Carlsberg, 2017a). In order to calculate Earnings before Interests, Tax, Depreciation & Amortisation (EBITDA), these costs have to be deducted from the core operations and combined to make a single item. This is carried out for all the companies analysed in this thesis except for Heineken, which recognises depreciation and amortisation by nature in their income statement.

Special Items: After impairment losses have been removed from special items, most of the remaining costs are related to restructuring cost. These costs have then been included in earnings from operations, as every company needs to restructure in order to stay competitive (Petersen & Plenborg, 2012).

Transitory Items: Carlsberg´s impairment of brands in Baltika Breweries has been categorised as part of the company's operations activity. This item has been allocated on a separate item-line due to its rareness and high amount (2015: 4 bn. 2017: 4,80 bn. DKK), for analytical purposes. In addition, Carlsberg's goodwill in China, in 2015, and a fair value adjustment in AB InBev of 6,410 USD Dollars, in 2013, are relocated, due to the same reasons. All these items are removed from the calculations of core EBIT and core Net Operating Profit After Tax (NOPAT) for analytical purposes, but included in EBIT and NOPAT in the income statement.

3.3.2 Balance Sheet Adjustments

Investment in associates: Share of profit is categorised as operational in the analytical income statement due to the reasons mentioned priory; therefore, investment in associates will also be categorised as operational in the balance sheet.

Deferred tax: Deferred tax assets generally arise from tax loss carry forwards or assets (liabilities) that are recognised at a lower (higher) value in the balance sheet than for tax purposes. Also deferred tax liabilities are treated as operating items, appearing because of temporary differences between book values

and tax values (Petersen & Plenborg, 2012). As Carlsberg's deferred tax assets and liabilities are mostly related to tangible and intangible assets and liabilities linked to operating activities of the on-going operation, they are treated as operating items. However, Carlsberg do not include deferred tax assets in their definition of invested capital (Carlsberg, 2017a). The analysts have decided to include deferred tax assets as part of operations, since the item, according to Petersen and Plenborg (2012), is argued to have a significant influence. A reason for Carlsberg's alternative classification could be due to the possibility that the company does not expect the item to being realised in the future, and therefore sees it as equivalent to equity.

Cash and cash equivalent (securities): Carlsberg does not split between cash used in operations and excess cash that is interest bearing in their annual report. In addition, Carlsberg treats cash and cash equivalents as excess cash when defining their invested capital, which indicates that it should be treated as excess cash. Hence, it is classified as a part of interest-bearing assets in the analytical balance sheet (Petersen & Plenborg, 2012).

Trade receivables and other receivables: According to Petersen and Plenborg (2012), trade receivables comprise invoiced goods and services as well as short-term loans to customers in on-trade establishments[3]. Other receivables include VAT, loans and interest receivables. Carlsberg's non-current trade receivables consist mostly of on-trade loans that fall due more than one year from the reporting date, and according to their policies, they treat on-trade loans as operating in nature (Carlsberg, 2017a). As there is no note on other receivables, it is not possible to separate the VAT from the loans and interest. This item, along with trade receivables, will be categorised as operational.

Other liabilities: In other liabilities for Carlsberg, there is a small portion that consist of deferred income, interest payable and fair value of hedging instruments, which is interest bearing in nature and should be classified as financial (Petersen & Plenborg, 2012). These costs are also deducted from their calculations of invested capital (Carlsberg, 2017a). However, Carlsberg have not included a note on other liabilities in their annual report, so there is no way of figuring out how much these items consist of. As these financial costs are substantially less than the portion that is operational, other liabilities will be categorised as part of operations. Not providing a note in the annual rapport regarding one of the largest items-line in both current and non-current liabilities can be criticised, since the items have significance in the balance sheet. This questions accounting quality and could lead to speculations about if there is a reason for Carlsberg to leave it out.

[3] On-trade is referred to as the sales channel to restaurant and bar industry (on the premises).

Retirement benefit obligations and similar obligations: Retirement benefit obligations cover both present and future retirees' entitlement to retirement benefits (Carlsberg, 2017a). As Carlsberg bear the risk associated with future developments in inflation and interest rates, these costs are interest bearing and classified as part of the group's financial activities.

Provisions: Restructuring provisions relate mainly to termination benefits to employees made redundant, primarily because of the restructuring projects accounted for as special items (Carlsberg, 2017a). As this has been categorised as part of operation in the analytical financial statement, this will also be the case for the balance sheet.

Assets held for sale: In the adjustments of the analytical balance sheet, assets and liabilities associated with assets held for sale are categorised as part of net-interest-bearing debt (NIBD). It is considered as a financial item as the disposal of those assets will reduce Carlsberg's borrowings, or increase cash and cash equivalents (Petersen & Plenborg, 2012).

3.4 Profitability Analysis

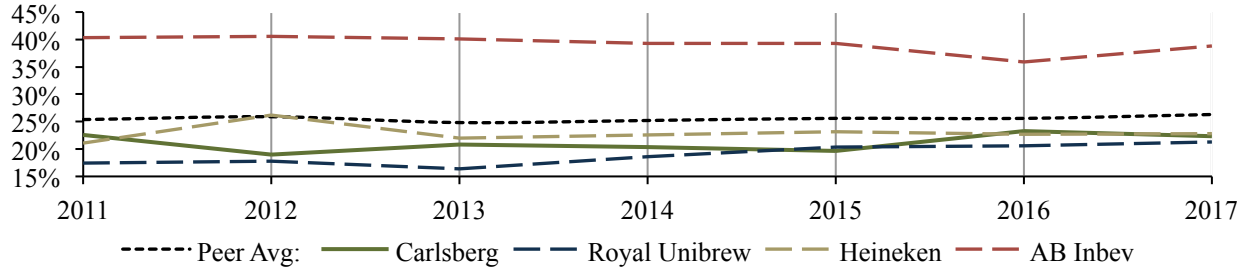
In the following section, ratios are generated based on the reformulated financial statements (Appendix 3-16). The ratios analysed are: Profit and NOPAT margins, Return on Equity (ROE), Return on Invested Capital (ROIC) and Asset turnover rate (ATO), and will be compared to the industry peer group. Furthermore, liquidity and risk will be examined to disclose how successful Carlsberg is to meet their short and long-term liabilities and what risk it imposes for the company. Additionally, significant re-occurring items have been excluded for the purpose of presenting a normalised operation, which provides a better foundation for the analytical purpose. The financial ratios will be analysed both by looking at tends in the individual company's time series and by cross-section comparison. (Petersen & Plenborg, 2012).

3.4.1 EBITDA Margin

As shown in Figure 9 Carlsberg does not have a competitive advantage compared to the peer group, when it comes to the EBITDA-margin. The most efficient company in the peer group is AB InBev, which in average almost has a 100% higher margin compared to the rest of the companies (Appendix 12). The reason for why AB InBev has a significantly higher EBITDA than the rest of the companies could be explained by the company's size. As previously stated, AB InBev is the single largest company in the beer

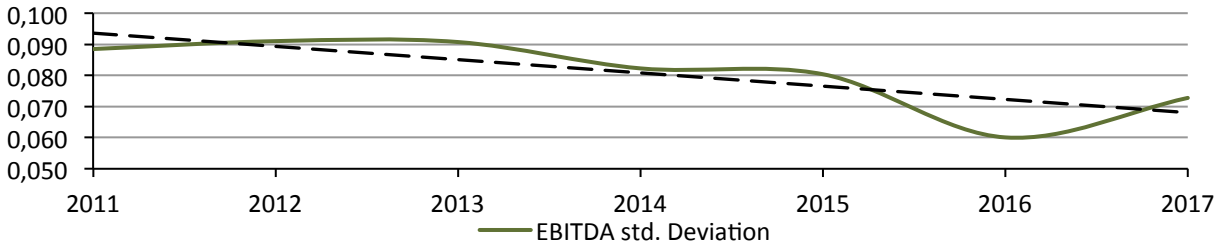
industry, when it comes to market shares and asset value. This gives the company the ability to utilise the advantage of economies of scale, to lower the production costs, which is evident in appendix 12.

Figure 9 – EBITDA-margin
Source: own creation based on (Carlsberg, 2011-2017, AB InBev, 2011-2017, Heineken, 2011-2017, Royal Unibrew, 2011-2017)



When looking at the overall development of the Carlsberg EBITDA, it is apparent that the EBITDA only fluctuates with the maximum of 3,3 percentage points during the seven years analysed (Appendix 12). Comparing the spread of the fluctuations to the peer group, it is evident that Carlsberg has one of most even developments in the EBITDA margin of all the companies. This can both be interpreted as a beneficial or a disadvantageous measure. A low fluctuation of EBITDA shows a stable and less volatile business operation, which would be seen as an advantage for the company. On the contrary, it might also tell a story of lack of development in the company's core operations. Though Carlsberg has the lowest fluctuating EBITDA for the period, it is evident from the peer group that the peers individually almost have a comparable standard deviation of the EBITDA margin, which reveals that Carlsberg in average is not less volatile than the rest, and therefore appear significantly similar to its competitors in the market.

Figure 10 – EBITDA fluctuation
Source: own creation based on (Carlsberg, 2011-2017, AB InBev, 2011-2017, Heineken, 2011-2017, Royal Unibrew, 2011-2017)



In addition, the peer group in general is developing towards a similar EBITDA margin. Though AB InBev has a significantly higher EBITDA margin than the rest of the peer group, it is evident from Figure 10 that the standard deviation amongst the companies is decreasing during the period. This could indicate that the companies are becoming more homogenised, which could be caused by the high level of competition in similar markets and strategies. The increase in similarity amongst the companies could also be a sign of

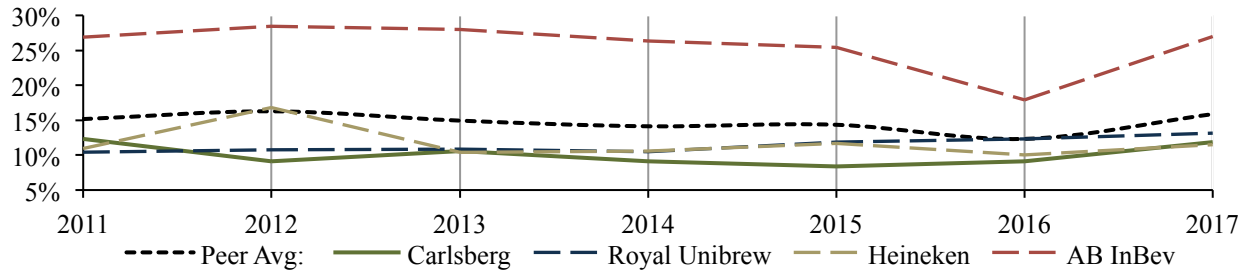
market fatigue, where companies are focused on competing for market shares, rather than exploring new markets (Petersen & Plenborg, 2012)**.**

Various divers can affect the EBITDA margin. Internally, costs and growth strategies are the main drivers that contribute to value. In order to increase the EBITDA margin, Carlsberg could reduce or/and optimise costs in its core operation. Additionally, pursuing growth strategies could also affect the margin in a positive way. For example by entering new markets, acquire market shares or developing new products. External factors also have an effect. For example market policies, exchange rate differences, switch in consumer preferences, GDP growth, direct competition in the industry from competitors and substitute products.

3.4.2 Profit Margin (NOPAT)

Compared to the EBITDA margin, NOPAT includes tax, depreciation & amortisation. These factors have significant influence on the profit from the core operations, which influence ROIC.

Figure 11 – Profit margin
Source: own creation based on (Carlsberg, 2011-2017, AB InBev, 2011-2017, Heineken, 2011-2017, Royal Unibrew, 2011-2017)



Looking at Carlsberg's development during the period in Figure 11, the result shows a fluctuation around the average of 7% NOPAT-margin. It is apparent that Carlsberg reaches an all-time low for the period in 2015, with a NOPAT margin of 5,9% The reason for the decrease in NOPAT in 2015 is due to high impairment loses in Eastern Europe and China. Although the impairments loses, have been excluded from the calculations, they seem to still have an effect on Carlsberg's performance.

Compared to the peer group, Carlsberg does not have a competitive advantage since the company performs below the average. Carlsberg is at the same time fluctuating more than any other company in the peer group is during the period. Since the reason is mainly caused by the relatively higher reconstruction costs, it indicates that Carlsberg is investing in developing the organisation, which could be the outcome of strategic decisions.

The value drivers would mainly be the same affecting the NOPAT margin as the EBITDA margin. Furthermore, financial drivers such as depreciation, amortisation and tax, have an impact on NOPAT.

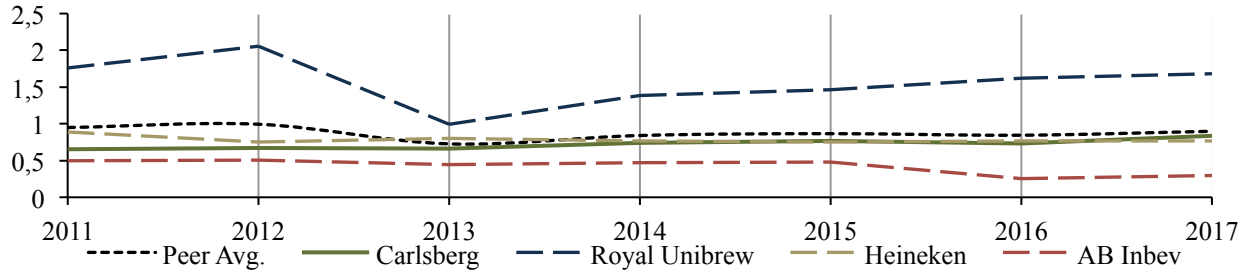
3.4.3 Asset Turnover Rate (ATO)

The ATO of invested capital expresses the company's ability to utilise its invested capital (Petersen & Plenborg, 2012). Translated, the ratio describes how much revenue a company generates from the marginal investment in the company's net operating assets. Thus, companies with a high ATO are better at generating return on their invested capital from their core operations. The formula for calculating the ATO is as following (Petersen & Plenborg, 2012):

$$ATO = \frac{Net\ Revenue}{Invested\ Capital}$$

When looking at the development of Carlsberg's ATO it is apparent that the company has an even development throughout the years (Figure 12). This indicates, like the profit margin, that the company is operating consistently with a low risk of deviation. Though Carlsberg is not showing a volatile trend in the ATO development, the values are below the peer group average for the whole period. The largest companies in the peer group (Heineken and AB InBev) do all have comparable steady ATO to Carlsberg, which could be correlated to the size of the companies.

Figure 12 – Asset turnover rate
Source: own creation based on (Carlsberg, 2011-2017, AB InBev, 2011-2017, Heineken, 2011-2017, Royal Unibrew, 2011-2017)



AB InBev operates with the lowest ATO amongst the peer group as the largest company, whereas Royal Unibrew operates with the highest ATO as the smallest company. This correlation between size and level of ATO is an interesting discovery. These findings might be explained on the premise that the beer industry is an asset intensive industry, where it requires larger investments in assets to sell globally compared to locally. Royal Unibrew operate on a few local markets, whereas Carlsberg, Heineken and AB InBev are developing significantly on global markets in comparison (AB InBev, 2017; Carlsberg, 2017a; Heineken, 2017; Royal Unibrew, 2017).

Multiple factors can affect ATO for both Carlsberg and the peers. Internal factors as the size of assets have a significant effect, where inventory is arguably a value driver. A low level of inventory and just in time (JIT) production can have a positive effect on the ATO. At the same time, it is evident that companies in the industry have a high level of no-current assets, due to large brewing facilities and inbound logistics. Optimising these assets would also improve the ATO. The size of the company seems to be correlated with the ATO, where smaller companies benefit from a lower ATO. External factors as market demand and consumer preferences can influence both the sales, but also the level of current assets from inventory.

3.4.4 ROIC

ROIC expresses the overall profitability of a company's operations, which is illustrated as the return on the invested capital in the company's operations as a percentage, and is calculated accordantly (Petersen & Plenborg, 2012):

$$ROIC = \frac{NOPAT}{Invested\ Capital}$$

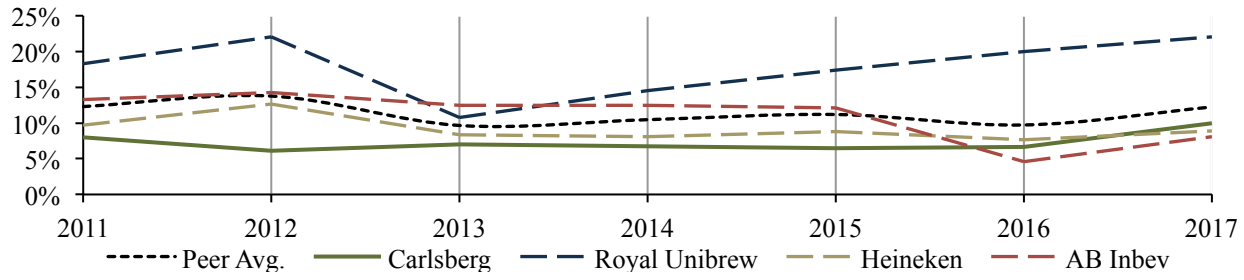
The ratio enables the analyst to directly compare the ROIC to an alternative investment with a similar risk profile, which is useful when defining the required return on the company's operations (Petersen & Plenborg, 2012).

Alternatively, ROIC can be decomposed from the Profit margin and the ATO in the following relation (Petersen & Plenborg, 2012):

$$ROIC = NOPATmargin * Asset\ turnover\ rate$$

From the relation it is evident that the only way to increase ROIC is to either increase the profit of the company or/and to utilise operating assets to produce volume.

Figure 13 – ROIC after tax
Source: own creation based on (Carlsberg, 2011-2017, AB InBev, 2011-2017, Heineken, 2011-2017, Royal Unibrew, 2011-2017)



From Figure 13 Carlsberg shows stable development during the period, where the result displays an all-time low ROIC in 2012, which is arguably due to the reconstruction costs, since the ATO has barely changed during the time around of the event. In general, Carlsberg is performing significantly below average, which is expected, as neither Carlsberg's ATO nor NOPAT-margin is competitively compared to the peer group. In 2017, it is realised that Carlsberg's ROIC performs slightly better than both Heineken and AB InBev. The increase in performance can be associated to increase in both ATO and NOPAT-margin, which has increased to a higher level than Heineken and AB InBev. Carlsberg's development in performance of the ROIC from 2015 to 2017 could be a sign that the prior restructuring of the company could already have shown benefits. The effect of the restructuring costs is shown as a decrease in equity and NIBD, which again decreases invested capital. The decrease in NIBD is manly affected by paying back short-term borrowings, whereas equity is affected by a write down of intangible assets. (Appendix 3-4)

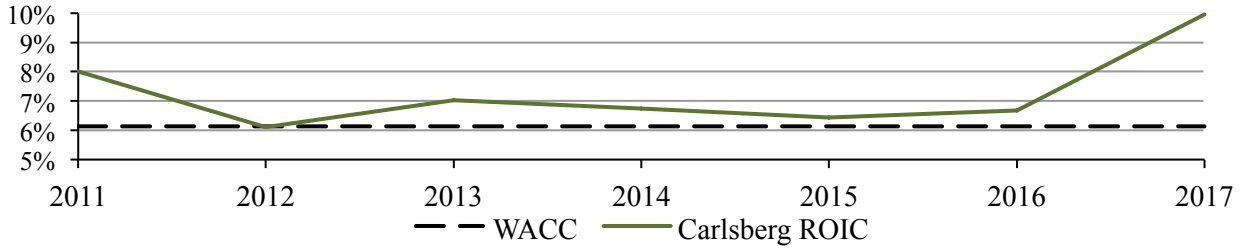
Although Royal Unibrew is the smallest company in the peer group and in theory should have less competitive advantages according to economies of scale, they outperform all companies in the peer group measured by ROIC (Brealey, et al., 2014). This is noteworthy, since it underlines the statement that minor companies can actually compete against the major companies.

When comparing ROIC to the calculated Weighted Average Cost of Capital (WACC[4]) it is possible to see how the company is performing compared to cost of capital and expectations from shareholders. If ROIC > WACC the company performs better than the cost of capital; thus adding value to shareholders. On the contrary, if ROIC < WACC, the company does not perform to its level of cost of capital, and company value decreases. Whereas the investors would be better off investing in other securities with the same risk profile (Petersen & Plenborg, 2012).

As seen in Figure 14, ROIC for Carlsberg, is in all years performing slightly higher than WACC, except in 2012. Only in 2011 and 2017, Carlsberg is performing noticeably better than WACC, whereas the other years barely add value to the company.

[4] The WACC used is calculated in chapter seven.

Figure 14 – ROIC vs. WACC
Source: own creation based on (Carlsberg, 2011-2017, AB InBev, 2011-2017, Heineken, 2011-2017, Royal Unibrew, 2011-2017)



With a WACC close to ROIC, it shows that Carlsberg should focus on improving its profitability by optimising operations and investments in profitable projects (Petersen & Plenborg, 2012). This could be achieved by cutting costs or divest non-profitable assets, which leads to an overall optimisation of the company operations, thus creating value for shareholders.

Internal value drivers that would influence the ROIC would be based on factors affecting invested capital, ATO and NOPAT. The restructuring appears to be a significant value driver that has improved Carlsberg ROIC towards 2017. Furthermore, restructuring affecting ROIC positively can also illustrate a skewed picture of the company's performance. If intangible assets experience a write down, it would arguably not be characterised as a positive event. This does although have a positive impact on ROIC, as it does not add any value to the company. Since WACC also drives the value in ROIC, the parameters in WACC are also an influence. Here the capital structure, market risk and credit risk would have an essential impact on ROIC. External drivers affecting ROIC would be the same that affects NOPAT and ATO. As a parameter in WACC the risk free interest rate would also be influential.

3.4.5 ROE

ROE is a financial driver that measure the profitability from the capital invested by the company's shareholders, and is calculated as followed (Petersen & Plenborg, 2012):

$$ROE = \frac{Net\ earnings\ after\ tax}{Book\ value\ of\ equity}$$

Although the ratio expresses the relation between Net earnings and Equity, other factors could also influence the interpretation of the ratio. Net earnings are both generated from invested equity but also accumulated debt in the company. This means that a company could obtain a higher ROE than others, due to a higher level of debt. This relation can be explained by (Petersen & Plenborg, 2012):

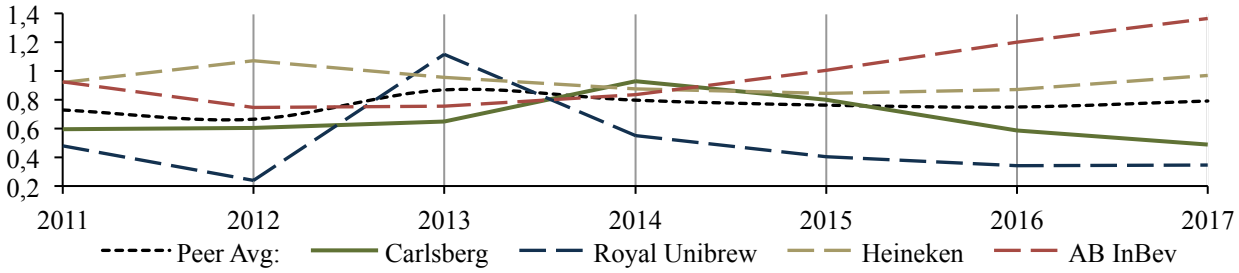
$$ROE = ROIC + (ROIC - NBC) * \frac{NIBD}{BVE}$$

A high level of debt would not only contribute to ROE, but also carry interest costs and thereby a higher risk of insolvency, since it increases the risk of Net Borrowing Costs (NBC) exceeding the return. The risk factor will furthermore be examined in the following section. The leverage is one of the components of ROE, and is calculates as (Petersen & Plenborg, 2012):

$$Financial\ Leverage = \frac{NIBD}{BVE}$$

As seen in Figure 15, Carlsberg's leverage changes during the period. The main factor that contributes to the fluctuation in year 2014 and 2015 is the major decrease in equity and minor increase in debt. The debt and equity is returning to the initial levels past 2015, which is illustrated in (Appendix 15). During the time of decreasing equity, Carlsberg relies on the debt to generate returns, which indirectly will affect the ROE and increase the risk in the company.

Figure 15 – Financial leverage
Source: own creation based on (Carlsberg, 2011-2017, AB InBev, 2011-2017, Heineken, 2011-2017, Royal Unibrew, 2011-2017)



When examining the leverage amongst the group it is difficult to find a pattern. It is possible to outline the trend that the larger the company is, the higher leverage the company has. Since there are multiple reasons to increase the debt in a company, the interesting part is to understand how the debt benefits the company's returns.

A company can fund its operations either by shareholder equity or by debt. Since both types of financing comes with a costs compared to an equal risk, hence a company can obtain the optimal mix of equity and debt associated with the lowest cost. This will be investigated further in chapter seven.

In addition to the leverage and the capital structure it is apparent that the peer group has a debt level, which varies on average from 40% - 60% (Table 1). Since 2014 Carlsberg has paid down its debt, and

according to SAIL '22 Carlsberg will continue to pay down debt even further, which will result in a capital structure that significantly differs from the peer group.

Table 1 – Debt ratio
Source: own creation based on (Carlsberg, 2011-2017, AB InBev, 2011-2017, Heineken, 2011-2017, Royal Unibrew, 2011-2017)

Debt ratio	2011	2012	2013	2014	2015	2016	2017	Avg.
Carlsberg	41%	43%	43%	51%	49%	41%	37%	44%
AB InBev	55%	61%	54%	54%	62%	72%	64%	60%
Heineken	54%	57%	56%	53%	50%	59%	59%	55%
Royal Unibrew	33%	36%	58%	47%	37%	26%	44%	40%

Carlsberg do not explain in any external rapports or public announcements why they are interested in pay down debt. A reason to deviate from the capital structure within the industry could be that Carlsberg presumably provide a higher risk towards the debt investors. This would increase the cost of debt.

In Table 2, NIBD/EBITDA ratio has been calculated to understand Carlsberg's ability to pay back its debt in comparisons to the peer group. Carlsberg states in a rapport to the company's debt holders that the aim for SAIL '22 is to have a NIBD/EBITDA ratio equal or lower than two (Carlsberg, 2017d).

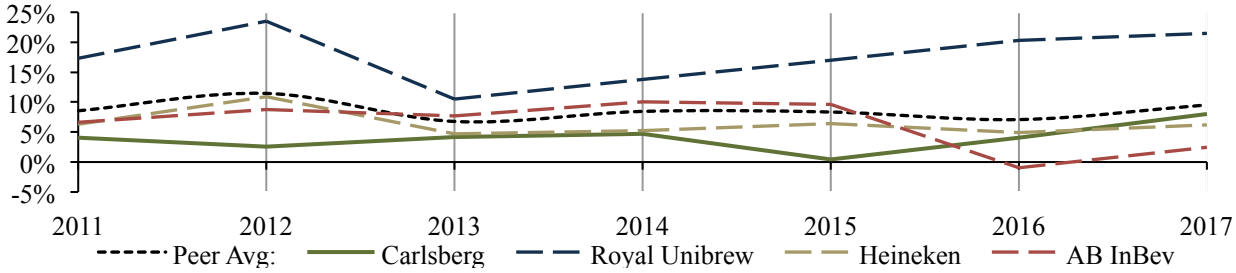
Table 2 – NIBD/EBITA ratio
Source: own creation based on (Carlsberg, 2011-2017, AB InBev, 2011-2017, Heineken, 2011-2017, Royal Unibrew, 2011-2017)

NIBD/EBITDA	2011	2012	2013	2014	2015	2016	2017	Avg.
Carlsberg	2,79	3,43	3,10	3,41	3,22	2,41	1,99	2,91
AB InBev	2,77	2,98	3,00	2,93	3,29	7,95	5,57	4,07
Heineken	2,91	2,90	3,14	3,07	2,87	3,40	3,35	3,09
Royal Unibrew	1,09	0,98	3,58	1,81	1,24	0,76	1,22	1,53

It is evident that Carlsberg does not have a significantly high NIBD/EBITDA ratio, which compared to the peer group, is at a competitive level. The aim to pay down debt to reach the ratio of two, when the industry in general is significantly higher, is a questionable strategy. Whereas a significant deviation from the industry average of capital structure seems in theory not to increase value for the company. Furthermore, Carlsberg does not provide any information or present any reason for desired NIBD/EBITDA ratio of two, but states that it has financial priority and creates value (Carlsberg, 2017d). Because of Carlsberg's lack of reporting in this area, it is not possible to understand the reason behind. On the other hand, deviating from the industry capital structure provides the opportunity to pursue the optimal capital structure for Carlsberg in the future.

As previously stated, it evident that the spread between ROIC and NBC (SPREAD) has a considerable impact on ROE (Sørensen, 2017). The larger the SPREAD is, the more the debt accumulated return. This means that obtaining debt with high spread is a good investment for the company and contributes to the ROE.

Figure 16 – Spread
Source: own creation based on (Carlsberg, 2011-2017, AB InBev, 2011-2017, Heineken, 2011-2017, Royal Unibrew, 2011-2017)



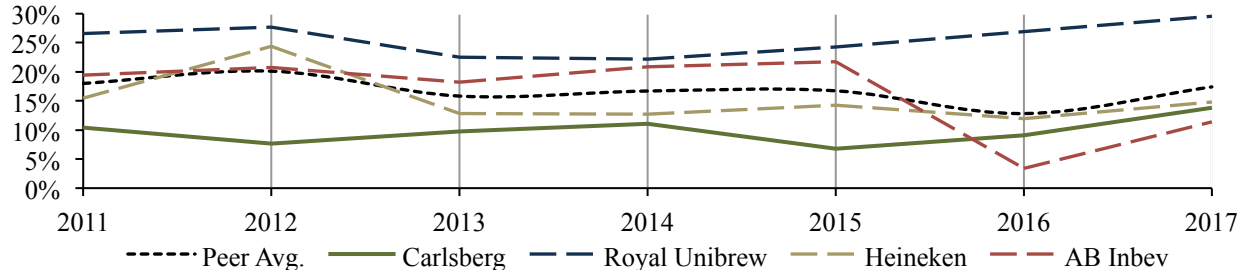
In Figure 16 it is current that Carlsberg has a positive SPREAD during the period, which means that their accumulated debt has provided a positive return. The SPREAD has decreased to almost 0% in 2015, which can be explained by the high restructuring costs as much as an all-time high NBC (Appendix 14 - 15). Since 2015 the SPREAD has increased to an all time high, which can be explained by the increase in returns on the invested equity. Compared to the peer group, Carlsberg has the lowest SPREAD in all years until 2016 and 2017, which seems to come from the turnaround point in 2015. Furthermore, AB InBev has a SPREAD close to 0% in 2016, which can be explained by the massive restructuring costs and borrowings before the acquisition of SAB Miller in 2017. This acquisition was partially funded by debt, which could not be expected to show an immediate return (AB InBev, 2016). The low SPREAD might support Carlsberg's argument to pay down debt. Since the company relatively has the highest NBC compared to ROIC in the industry, it indicates that Carlsberg does not provide a sufficient return on the debt accumulated. In this case, it would be beneficial to pay down debt or optimise the company's core operation. Carlsberg's state of liquidity will be analysed further in chapter 3.5.

As explained, various factors drive the value in of Carlsberg debt strategy. Internal factors such as cost of debt and cost of equity are affecting the required rate of return on both debt and equity, which influences the capital structure. An optimal capital structure would yield the lowest costs of capital, and provide an increased value for the company. Furthermore, Carlsberg's ability to yield a competitive return on its debt, by decreasing NBC, would also increase value. These internal value drivers are likewise affected by external drivers, such as the risk free interest rate, market risk and credit risk.

3.4.5.1 ROE conclusion

Looking at the development in ROE, Carlsberg is operating with a low level of fluctuation within the period (Figure 17). Due to the restructuring, which has resulted in a low SPREAD and thereby inefficient return on the debt, Carlsberg has in 2015 an all-time low ROE. The ROE increases thereafter in the following years. Compared to the peer group, Carlsberg has in general a lower ROE. However, AB InBev does have a decrease in ROE in 2016 and 2017, which can be argued to be a result of the poor return on debt invested in the acquisition of SAB Miller, which has not yet revealed its full potential of return.

Figure 17 – ROE
Source: own creation based on (Carlsberg, 2011-2017, AB InBev, 2011-2017, Heineken, 2011-2017, Royal Unibrew, 2011-2017)



Again, Royal Unibrew provides the highest level of ROE, which is arguably due to their high utilisation of debt as much as the high level of ROIC. As much as in the analysis of ROIC, it is apparent that the smallest company in the peer group is comparably outperforming the rest. Smaller production volumes sold to local markets could be the reason for this. Though Royal Unibrew cannot benefit from the economies of scale compared to AB InBev, the small brewery has the advantage of being able to stock less inventory and would be more flexible to restructure.

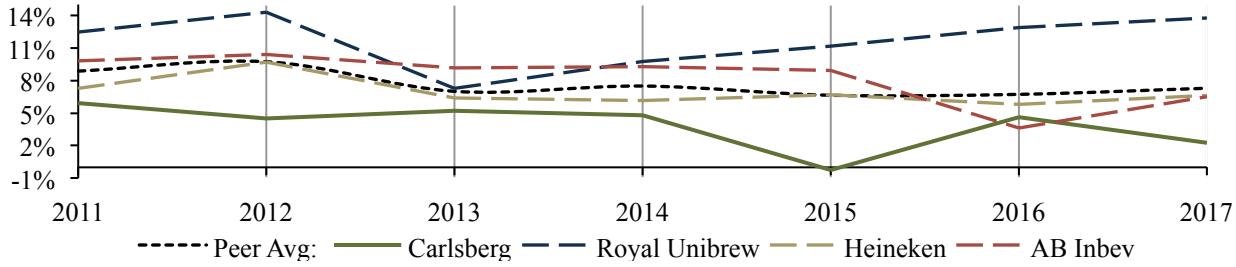
The internal drivers that affect the value creation in ROE can be summarised from the ROIC and Leverage section, since both of them have a significant impact on ROE. As seen from the development in ROE compared to peer group, a company's ability to produce JIT, could also influence ROE positively. External factors would be as previously mentioned the same factors affecting both ROIC and Leverage.

After decomposing ROE to understand the debt's influence on the ratio, it is interesting to examine the companies' ability to create return on its assets (ROA). As all companies have comparable assets, ROA can elaborate which companies utilise their assets the most optimal way. This could indicate strength or weakness in Carlsberg's operation. ROA is calculated as followed:

$$ROA = \frac{Net\ income}{Operating\ assets}$$

From the development in Figure 18 it is clear to see that Carlsberg has the lowest return in comparison to operating assets. This indicates that the company uses a larger amount of resources in production in comparison to its peers.

Figure 18 – ROA
Source: own creation based on (Carlsberg, 2011-2017, AB InBev, 2011-2017, Heineken, 2011-2017, Royal Unibrew, 2011-2017)



The low ROA illustrates an area of improvement, which would yield a significant value increase for Carlsberg, if the company performed to the level of its peers. Internal value drivers would be optimising core operations to improve profitability. Additionally, decrease in assets would also result in a higher ROA, but would not always be a sign of strength, especially if the company impairs intangible assets. Since the cost of impairment is included in net earnings, the positive impact in ROA from reducing the intangible assets would be visible in the forthcoming years. External factors would be similar to previously state factors that are related to the growth in revenue.

3.5 Liquidity Analysis

Liquidity refers to a company's ability to pay its bills and make profitable investments, and in some cases, a lack of liquidity leads to bankruptcy (Petersen & Plenborg, 2012). This section will therefore analyse Carlsberg´s ability to meet their current and non-current liabilities. The analysis of Carlsberg's liquidity ratios are benchmarked against the peer group to get a better picture of their relative performance. Firstly, the thesis will look at the short-term liquidity risk, which will uncover the company's ability to pay all short-term obligations. Secondly, the long-term financial health and the ability to pay future obligations will be discussed.

3.5.1 Short-term and long-term liquidity ratios

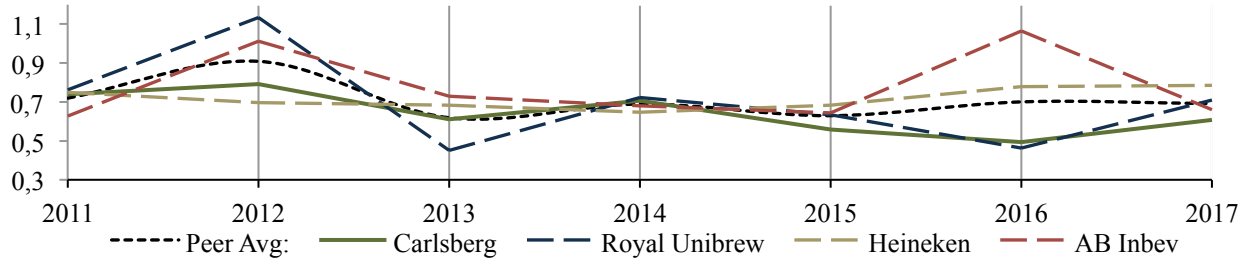
3.5.1.1 Current Ratio

The current ratio gives an explanation if current assets would cover current liabilities in the event of liquidation. Current ratio is calculated as followed (Petersen & Plenborg, 2012):

$$Current\ ratio = \frac{Current\ assets}{Current\ liabilities}$$

The larger the ratio, the more likely that the liquidation of current assets would cover current liabilities and thus lower short-term liquidity risk. A ratio below one indicates that current assets do not cover current liabilities, thus the company is not able to cover their short-term obligations (Petersen & Plenborg, 2012). Figure 19 shows that the current ratio for the peer group is significantly low but stable. Indicating a high risk that current assets do not cover current liabilities in the event of liquidation. A significant internal value driver for the current ratio is the level of trade payables. It is evident that Carlsberg has a high level of trade payables in comparisons to trade receivable, which does have a substantial impact on the ratio.

Figure 19 – Current ratio
Source: own creation based on (Carlsberg, 2011-2017, AB InBev, 2011-2017, Heineken, 2011-2017, Royal Unibrew, 2011-2017)



In the view of liquidation, this shows an increased risk of Carlsberg not being able to pay back the short-term debt. On the other hand, having high trade payables can be used as another method to finance the company's operation, in addition to borrowings. This in most cases should yield a lower interest rate, and by not paying the supplier up front, would resolve moral hazard problems (Murfin & Njoroge, 2014). Furthermore, it is evident that the current ratio is significantly affected by the level of other liabilities, which is the second highest account item included in current liabilities. Due to inconclusive information and lack of notes, it is not possible to identify the various costs included. Again, the insufficient information can be criticised, since an account of this size should be declared, which questions the accounting quality. The level of inventory in Carlsberg is also a driver that seems to have an effect on the

current ratio for Carlsberg. Although, a high level of inventory is a sign of locked capital, which has a positive effect on the current ratio, as it increases the company's short-term liquidity. An external driver, which seems plausible to have an effect on the current ratio, is the level of credit time that suppliers are willing to provide Carlsberg. This factor is less controllable in the eye of Carlsberg, but as Murfin and Njoroge (2014) conclude, the larger the buying company is, the better position the company has when negotiating credit time with suppliers.

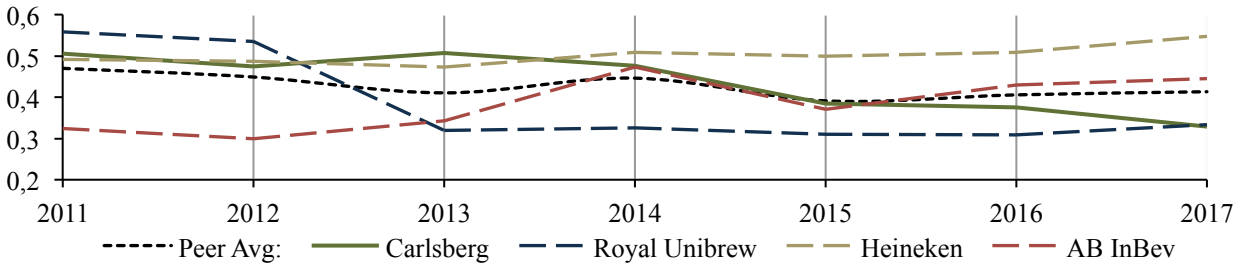
3.5.1.2 Quick Ratio

The quick ratio is similar to the current ratio and follows the same principals, but excludes inventory as the basic idea is to include only the most liquid assets (Petersen & Plenborg, 2012):

$$Quick\ Ratio = \frac{Current\ asstets - inventory}{Current\ liabilities}$$

As the ratio excludes the inventory, the result yields a lower value than the current ratio. Figure 20 shows Carlsberg's quick ratio being stable and average compared to its peers through the analysed period.

Figure 20 – Quick ratio
Source: own creation based on (Carlsberg, 2011-2017, AB InBev, 2011-2017, Heineken, 2011-2017, Royal Unibrew, 2011-2017)



Compared to the current ratio the peers seem to be affected by a high level of inventory, since Carslberg shows a stronger financial position when it comes to converting assets into cash. Overall both short-term liquidity ratios show a below average but stable indication that there is a short term risk that current assets would not cover current liabilities. The figures show that the average is low for the analysed peer group.

As previously mentioned the most significant internal value driver is the low level of inventory in comparisons to the rest of the peer group. This furthermore show a trend in the industry that it is possible to operate with a relatively high level of current liabilities compared to liquid assets. Credit time from suppliers can also in this ratio be seen as a significant external value driver.

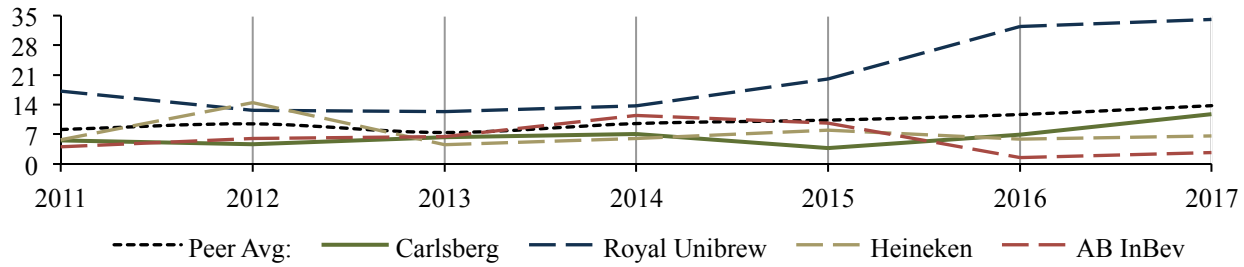
3.5.1.3 Interest Coverage Ratio

Interest coverage ratio is a measure of long term liquidity risk, and indicates a company's ability to meet its net financial expenses, i.e. how many times operating profit covers net financial expenses (anything over 1 shows a positive interest coverage ratio). The higher the ratio, the lower the long-term liquidity risk. The ratio is calculated as followed (Petersen & Plenborg, 2012):

$$Interest\ coverage\ ratio = \frac{EBIT}{Net\ financial\ expenses}$$

In comparison to the peer group, Carlsberg's interest coverage ratio is consistently below average, which means that the company has a higher long-term liquidity risk than the majority of peers (Figure 21). Carlsberg´s ratio improves substantially in the analysed period, which is the result of both increase in core EBIT but also a significant decrease in Net Financial Expenses (Appendix 3-4)

Figure 21 – Interest coverage ratio
Source: own creation based on (Carlsberg, 2011-2017, AB InBev, 2011-2017, Heineken, 2011-2017, Royal Unibrew, 2011-2017)



The main internal drivers that affect the value of the ratio are the same affecting the level of EBIT. Carlsberg would be able to increase its interest coverage ratio by decreasing cost in operation or improving revenue. Furthermore, depreciation also affects the ratio. External factors, such as credit risk, affects net financial expenses, as the higher risk the company provides for the debt holders, the higher interest on the debt they require.

3.6 Growth Analysis

Growth is associated with value creation, and is by many seen as the driving force behind future progress in enterprises. Growth is a function of many factors including the company's individual strategy, market growth, market share and intensity of competition (Petersen & Plenborg, 2012). This section will focus on

Carlsberg´s growth rates, as well as a comparison with the rates of the peer group. The comparison it conducted in order to assess the relative performance of Carlsberg, and to identify future growth opportunities for the company.

3.6.1 Sustainable Growth Rate

A company's sustainability growth rate is used to indicate the maximum pace a company can grow its revenues without having to increase financial leverage, or look for outside financing. If a company surpass this rate its growth will decline in the long term, and it must lend more funds to get additional growth. Knowledge about the sustainable growth rate is also important in valuing companies, and can be used to identify different sources of growth in operational and financial drivers. This knowledge is central when assessing the quality of growth (Petersen & Plenborg, 2012). The sustainable growth rate is determined by a combination of the company's profitability in operations, its financial leverage and the dividend policy. In Table 3, the components included in calculating Carlsberg's sustainable growth rates for the historical period from 2011 to 2017 are presented.

Table 3 – Carlsberg's sustainable growth rate
Source: own creation based on (Carlsberg, 2011-2017, AB InBev, 2011-2017, Heineken, 2011-2017, Royal Unibrew, 2011-2017)

Sustainable Growth Rate	2011	2012	2013	2014	2015	2016	2017
ROIC after tax	8,02%	6,10%	7,02%	6,75%	6,43%	6,69%	9,95%
Net borrowing cost (NBC)	-3,91%	-3,48%	-2,84%	-2,02%	-6,04%	-2,65%	-1,92%
Spread	4,11%	2,62%	4,18%	4,72%	0,39%	4,03%	8,04%
Gearing	0,60	0,60	0,65	0,93	0,80	0,59	0,49
Pay-out Ratio	16%	16%	22%	31%	32%	34%	34%
Sustainable Growth Rate	**-**	**8,81%**	**6,08%**	**7,52%**	**7,15%**	**4,39%**	**5,71%**

Everything else being equal, an increase in ROIC or decrease in pay-out ratio will lead to a higher sustainable growth rate. Where an increase in dividend paid to shareholders will have a negative effect on the sustainable growth rate. If the entire profits were distributed to the company's shareholders, the sustainable growth rate would have been 0% (Petersen & Plenborg, 2012). In the case of Carlsberg, the dividend policy has had a negative effect on the sustainable growth rate, as it has grown from 16% to 34% in the last 7 years. On the other hand, the impact of the financial leverage on the sustainable growth rate has had a positive effect for Carlsberg throughout the entire period analysed, with a positive spread. This because Carlsberg has manage to earn a profit on operations with a stable and positive average return on invested capital in excess of their net borrowing cost (spread). A high sustainable growth rate indicates

that Carlsberg has chosen to reinvest most of its accounting profit instead of paying it out to is shareholders, something that is only profitable if reinvestments are value creating.

3.6.2 Growth and Value Creation

To further examine Carlsberg´s growth and future possibilities, the growth in certain accounting items have been analysed in Table 4 to better get a picture of how Carlsberg have developed through the period.

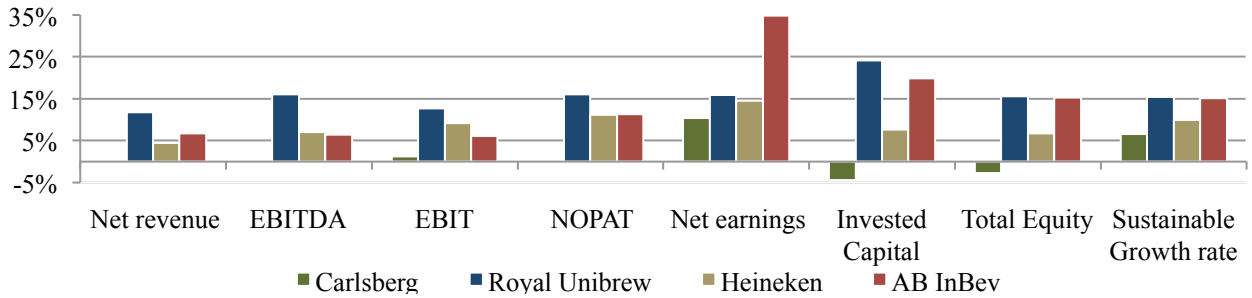
Table 4 – Carlsberg's historical growth in key margins
Source: own creation, based on (Carlsberg annual reports, 2010-2017)

Growth Carlsberg	2011	2012	2013	2014	2015	2016	2017	Average
Net revenue	63,561	5,7%	-1,0%	-3,1%	1,3%	-4,2%	-1,3%	-0,4%
EBITDA	14,353	-11,1%	8,9%	-5,4%	-2,4%	13,6%	-5,2%	-0,3%
EBIT	10,526	-22,8%	17,4%	-13,9%	-30,1%	49,8%	7,2%	1,3%
NOPAT	7,846	-21,6%	14,3%	-16,1%	-7,4%	4,2%	28,7%	0,4%
Net earnings	6,418	-24,7%	22,3%	-14,6%	-151,2%	288,1%	-57,6%	10,4%
Invested Capital	97,859	3,0%	-0,7%	-12,6%	-2,8%	0,2%	-13,5%	-4,4%
Total Equity	61,335	2,6%	-3,4%	-25,3%	4,1%	13,6%	-7,7%	-2,7%

The analysis of Carlsberg´s different growth rates shows a disparate picture of the company's growth. EBIT, NOPAT and net earnings increase on average through the period, whilst invested capital show a small negative average decline through the last seven years. Net revenue, net earnings and EBITDA have been stable but shown a slight negative trend in average. The growth analysis also shows that Carlsberg has been a volatile business in later years, with operational impairment losses as one of the main reason.

A comparison of Carlsberg´s average ratios, with the rest of the peer group in Figure 22, shows that Carlsberg´s relative performance is currently well below that of its peers, indicating growth opportunities from improving core operational activities.

Figure 22 – Average growth compared to the peer group (2011-2017)
Source: own creation based on (Carlsberg, 2011-2017, AB InBev, 2011-2017, Heineken, 2011-2017, Royal Unibrew, 2011-2017)



Petersen and Plenborg (2012) states, that seen from a shareholder perspective, value creation is only obtained if ROIC exceeds WACC, which in Carlsberg's case it does in all years except in 2012 (Figure 14). However, growth is only interesting if EVA increases. Table 5 shows Carlsberg's growth in EVA in the analysed period.

Table 5 – Growth in EVA
Source: own creation, based on (Carlsberg, 2011-2017)

Growth in EVA	2011	2012	2013	2014	2015	2016	2017
ROIC	8,02%	6,10%	7,02%	6,75%	6,43%	6,69%	9,95%
WACC	6,135%	6,135%	6,135%	6,135%	6,135%	6,135%	6,135%
Invested capital	97,859	100,772	100,076	87,436	84,982	85,120	73,603
EVA	1,843	-0,031	0,889	0,536	0,252	0,471	2,812
Growth in EVA		-102%	2968%	-40%	-53%	87%	497%

As seen, EVA is negative in 2012, hence destroying value for its shareholders, but has been positive for the subsequent years thereafter. Even though revenue growth was positive in 2012, it did not create value for Carlsberg's shareholders. Contrary, Carlsberg's growth in revenue has been mostly negative since 2012, whiles EVA has been positive. This indicates that Carlsberg from a shareholders perspective is a growth business. The reason for growth in EVA with declining revenue growth can be linked to optimising of existing core operations (improving ROIC) or a reduction in WACC, the last being less likely as there are limited actions a company can take to reduce its cost of capital (Petersen & Plenborg, 2012).

This shows that the growth in EVA and value creation in Carlsberg after 2015 (SAIL '22), can be linked to improvements in their core operations. This is however seen as a short-term solution for growth in EVA, as there is a limit to how much a company can optimise operations. Therefore, long-term growth must come from investments in profitable business projects (Petersen & Plenborg, 2012).

3.7 Financial Value Drivers

Throughout the profitability analysis of Carlsberg's performance, various factors have been identified that drives value in different areas of the company's operation. From the analysis, both internal and external drivers have been analysed and discussed, seen in the Table 6. It is evident that most significant internal value drivers are related to the performance in Carlsberg's core operation. Since Carlsberg generally underperforms compared to its peers, restructuring, improve value chain efficiency and reduce costs in operation would create substantial value. Also related to operation, it is evident that inventory control and

the ability to produce JIT would increase profitability, which has a major influence on short-term liquidity risk. Furthermore, cost of capital and capital structure play a role in the value created for shareholders.

Table 6 – Financial value Drivers
Source: own creation

	Profit margin	EBITDA margin	ATO	ROIC	ROE
Internal Factors	New markets	Restructuring	Inventory	Increase revenue	Overall costs
	Increase market share	Outsourcing	Current asstes	Reduce costs	Cost of capital
	New products	Optimising value chain	Non current asstes	Return on debt	
		Operational costs	Company size	Return on equity	
			Just in time (JIT)	Impairment	
External Factors	Political factors	Material prices	Market demand	Risk free interest rate	Growth
	Consumer trends	Inflation	Consumer trends		
	Substitute products	Tax			
	GDP growth	Infrastructure			
	Social issues	Exchange rate			
	Tax				
	Competition				

The main external factors that affect Carlsberg's performance are mainly related to growth. Political factors such as laws, tax and regulation can be seen as risk towards the company's future growth. Growth in GDP could also be a value driver, which indicates the growth in an economy as a whole, and can reveal market opportunities. Additionally, external factors such as the risk free interest rate, market risk and credit risk, influence the cost of capital, which again affects the value created for the company shareholders.

3.7.2 Strengths and weaknesses

From analysis, it is evident that Carlsberg has as strength from the ability to quickly benefit from the restructuring in 2015, which has improve the company´s performance in the years to follow. Additionally, Carlsberg has a lower short-term liquidity risk compared to the peer group, where a low level of inventory provide an advantage. On the contrary, Carlsberg underperforms in all other areas relatively to the peer group. Furthermore, Carlsberg tends to deviate significantly from the average capital structure in the peer group, which arguably should not create value for the company.

4. Strategic Analysis

The strategic analysis will provide valuable knowledge about the historical, current and future external and internal factors that affect the industry and Carlsberg. The aim of this section is to identify the industry and firm specific factors, in order to achieve a better forecast in chapter six. Petersen and Plenborg (2012) imply that the strategic or operational initiative undertaken by a company is what will improve value. Therefore, it is important to identify and analyse all the factors that might affect Carlsberg's future development. The structure of this part will follow Petersen and Plenborg (2012) suggested top down approach to get a better understanding of the strategic factors influencing cash flow potential and risk. First identifying the external factors thorough a Political, Economic, Social and Technological (PEST) analysis. Then finding the industry specific factors through Michael Porter's (1979) five forces analysis. Before, ending the strategic analysis with a value chain and VRIO analysis of Carlsberg's internal specific factors. The findings will be summed up in the SWOT analysis in chapter five.

4.1 External Strategic Analysis (PEST)

The PEST analysis framework helps to identify macro factors affect industries and companies differently; therefore, it is crucial to understand which factors have had an influence in the past and which factors will have an impact on the future development (Petersen & Plenborg, 2012). The PEST model identifies these macro risks and potential cash flow possibilities through four key elements: political factors, economical factors, social factors and technological factors. The political and economic factors will focus on the key markets where Carlsberg operates, whilst the social and technological factor will take a broader industry approach.

4.1.1 Political Factors

Political factors are a major risk for the companies that operate within the beer industry. High taxes and governmental laws on the consumption of alcohol can have server consequences, affecting the conditions that companies operate under in the different markets. The laws on the consumption of alcohol are constantly changing, and excise taxes set by governments are frequently increasing. Carlsberg's excise duties on beer and soft drinks amounted to 25,134bn DKK in 2017 (Carlsberg, 2017a). According to the Carlsberg's, tax policy report (2017b), a large portion of the company's tax payments are made up of excise duties, direct taxes (etc. environmental taxes), real estate taxes and VAT. Changes in such duties

applicable to Carlsberg's products may affect the prices at which they are sold, which again can affect the demand for the products and sales volumes (Carlsberg, 2017c).

4.1.1.1 Western Europe

In Carlsberg's western European market, most countries where they are present are affected by the excise tax set by the EU. The EU tax rule for alcohol aims to prevent trade distortions in the single market, to ensure fair competition between businesses and reduce administrative burdens for operators. EU legislations only set minimum rate where member states are free to apply excises rates above the minimum required. The minimum rate is currently 1,87 euro per hectolitre degree alcohol (European Commission, 2018).

4.1.1.2 Eastern Europe

Carlsberg's ongoing downfall in Russia from 2010 is a noteworthy example of the consequences that political and legal factors can have on companies that operate in the beer industry. During the last decade, beer sales in Russia had risen by more than 40%, while vodka sales have fallen by nearly 30%. Resulting in high profits for Carlsberg since the 2008 takeover of the Baltika beer brand, and over a 40% market share. The problems for Carlsberg in their operations in Russia started when the government in 2011 raised the beer taxes by 200%, as a measure to cut down on alcoholism, after reports of an increase in young people drinking beer (Borthwick, 2011).

The next step of the new government regulation that began in 2012 was to increase the excise duties on beer by another 20%, and ban advertisements of alcoholic beverages. Banning advertisements of alcohol products follows the Norwegian model of being a "dark market" for such products, meaning that all advertising for alcohol products are banned from television, radio, public transport, the internet and print media. To make matters worse for Carlsberg, in 2013 the government banned the sale of beer from kiosks and other outlets such as transport hubs and petrol stations, sales that account for about a fifth of all places beer is sold (Milne, 2012). The consequence for Carlsberg of the continued rise in excise taxes and bans on advertisements were extreme. The annual report (2015) showed impairment of brand losses of 4bn DKK on their Baltika brand, and there were no signs that it would get better in the near future.

On January 1st 2017, the Russian government put another ban on the sales of alcoholic products, banning the sales of alcohol in plastic bottles having more than 1,5 litres in capacity. The Polyethylene terephthalate (PET) ban had great consequences for Carlsberg. Beer in plastic bottles affected by the PET ban accounted for 15% of their Baltika brand products sold in the market. The PET ban resulted in the Baltika brand again accruing impairment losses, this time of 4,8bn DKK. Carlsberg thereafter changed the

focus to local and regional brands and updating their assumptions on interest rates in Russia, (Gronholt-Pedersen, 2018).

The problems Carlsberg encounter in Russia is a good example of the political risks that the beer industry can face in a market, and how quickly it can change from success to failure. Carlsberg did also face another significant risk in their eastern European market with the Ukraine crisis in 2013. Ukraine being Carlsberg's second largest market in Eastern Europe after Russia, seeing profits fall in 2014 as an effect of the slowdown in the economy (Ruddick, 2014).

4.1.1.3 Asia

For their Association of Southeast Asian Nations (ASEAN) markets, the ASEAN excises tax reform (2014) states that the member states should follow a simple best practise of applying taxes according to alcohol strength of the product. This to ensure fair and equal treatment of goods with similar characteristics, and to simplify the excises tax system to enable a more transparent production, import and export of alcohol beverages across ASEAN. China, Carlsberg's larges market in Asia, subjects beer and malt products to a VAT and Consumption tax. The rates are compiled into a formula that is used to determine the effective tax rate of the product (TTB, 2018). Where the excise duties have remained at a relative low 8% (Dixit, 2015)**.**

4.1.2 Economic Factors

The economic factors affect the current sales and future demand for a company's products and services, which again influences the profitability, and how a company has to conduct its business. This section will focus on the economic development (GDP), inflation rates and exchanges rates in the main markets where Carlsberg conducts their business.

4.1.2.1 Economic growth (GDP)

Gross domestic product (GDP) is the monetary value of all goods and services produced in a nation during a period, usually one year, and is the most important measure of a nation's economic health and progress. The GDP growth explains how fast the given economy has grown from one period to the next (Brezina, 2012). Beer that also has a clear correlation with strong economic growth, as people tend to drink more beer in times of growth (Syed, 2012). Economic growth of a market is important to Carlsberg as it could adversely affect the demand for its products, and especially in emerging and growth markets where the consumption of beer and soft drinks tend to rise and fall with the economic growth of the market. Whereas Carlsberg is exposed to risk of an economic downturn or recession, in one of their key markets, such as

Russia and China (Carlsberg, 2017c). Table 7 shows the historical and forecasted GDP growth rates from 2011 until 2022E, for some of Carlsberg's key markets, predicting a future average growth for all of the markets.

Table 7 – Annual GDP growth in selected countries
Source: own creation, GDP of the selected countries (International Monetary Fund, 2017a)

GDP Growth	2011	2012	2013	2014	2015	2016	2017	2018E	2019E	2020E	2021E	2022E	18e-22e
China	9,5%	7,9%	7,8%	7,3%	6,9%	6,7%	6,8%	6,5%	6,3%	6,2%	6,0%	5,8%	6,2%
Denmark	1,3%	0,2%	0,9%	1,7%	1,6%	1,7%	1,9%	1,8%	1,8%	1,9%	1,8%	1,8%	1,8%
EU	1,8%	-0,4%	0,3%	1,8%	2,3%	2,0%	2,3%	2,1%	1,8%	1,8%	1,7%	1,7%	1,8%
India	6,6%	5,5%	6,4%	7,5%	8,0%	7,1%	6,7%	7,4%	7,8%	7,9%	8,1%	8,2%	7,9%
Norway	1,0%	2,7%	1,0%	1,9%	1,6%	1,1%	1,4%	1,6%	1,9%	1,9%	1,8%	1,9%	1,8%
Russian	5,1%	3,7%	1,8%	0,7%	-2,8%	-0,2%	1,8%	1,6%	1,5%	1,5%	1,5%	1,5%	1,5%
Ukraine	5,5%	0,2%	0,0%	-6,6%	-9,8%	2,3%	2,0%	3,2%	3,5%	3,7%	4,0%	4,0%	3,7%

China, one of Carlsberg's key markets, shows a downwards trend in GDP growth throughout the period, falling from 9,5% to a predicted 5,8% in 2022E, but is still among the countries with the highest GDP growth in the world. The decrease in GDP growth can be explained by the working age population, peaking in 2012, and that China's technological gap compared to other rich countries is smaller than in the past, suggesting that productivity growth will be lower (The Economist, 2015). Ukraine, Carlsberg's second largest market in Eastern Europe, is showing a predicted increase in GDP after the 2013 crisis, slowly moving back towards the growth rates of the previous years. Whereas the more mature markets of Western Europe and Russia are indicating a stable growth of between 1,5 – 1,8% throughout the entire period. India has now surpassed china, and is currently the fastest growing major economy. The rise in GDP is mainly due to major governmental structural reforms that are expected to pay off in the future years (Iyengar, 2018).

4.1.2.2 Inflation

Inflation is the rate of rising prices of general goods and services, or equivalently, of continuously falling purchasing power of the currency (Laidler & Parkin, 1975). High inflation rates reduces the purchasing power of the consumer, while a low inflation (deflation) the opposite happens, and might even start a depression. The Federal Reserve (2018) judges that an inflation rate of 2% is ideal, as having a small level of inflation makes it less likely that the economy will experience harmful deflation if the economic conditions worsen. The 2% rate is also consistent with the Federal Reserve's long run mandate for price stability and maximum employment. Table 8 displays the historical and predicted future inflation rates in Carlsberg's key markets.

Table 8 – Inflation rate, average consumer prices (annual percentage change)
Source: own creation, Inflation of the selected countries (International Monetary Fund, 2017b)

Inflation growth	2011	2012	2013	2014	2015	2016	2017	2018E	2019E	2020E	2021E	2022E	18e-22e
China	5,4%	2,6%	2,6%	2,0%	1,4%	2,0%	1,8%	2,4%	2,5%	2,6%	2,6%	2,6%	2,5%
Denmark	2,8%	2,4%	0,8%	0,6%	0,5%	0,3%	1,0%	1,4%	1,8%	2,0%	2,0%	2,0%	1,8%
EU	3,1%	2,6%	1,5%	0,5%	0,0%	0,2%	1,7%	1,7%	1,9%	1,9%	2,0%	2,0%	1,9%
India	9,5%	10,0%	9,4%	5,8%	4,9%	4,5%	3,8%	4,9%	4,8%	4,9%	5,0%	5,0%	4,9%
Norway	1,3%	0,7%	2,1%	2,0%	2,2%	3,6%	2,1%	2,0%	2,2%	2,3%	2,5%	2,5%	2,3%
Russian	8,4%	5,1%	6,8%	7,8%	15,5%	7,0%	4,2%	3,9%	4,0%	4,0%	4,0%	4,0%	4,0%
Ukraine	8,0%	0,6%	-0,3%	12,1%	48,7%	13,9%	12,8%	10,0%	7,0%	6,5%	5,5%	5,0%	6,8%

All Carlsberg's key markets show a positive inflation rate throughout the period. The Western markets of Scandinavia and the EU, and China are predicted to have a stable growth in inflation of prices, with a predicted forecasted average growth of 1,8% to 2,5% annually, which is in line with the ideal inflation rate. Russia and Ukraine, the two key markets in Eastern Europe, are showing a decrease in inflation growth rates after the volatile period around the Ukraine crisis. The inflation rates are still above the ideal rate, but the eastern market is predicted to move towards more stable inflation growth rates of 4% in Russia and around 5% in Ukraine at the end of the forecasted period (2022E).

4.1.2.3 Exchange rates

Carlsberg publishes its financial statements in Danish kroner. However, a substantial portion of their assets, liabilities, revenue and costs are denominated in currencies other than Danish kroner. This implies that the company is exposed to the fluctuations of currencies that can affect the business and profits (Carlsberg, 2017c). Carlsberg get a substantial part of their revenue streams from Baltika Breweries in Russia. An economic downturn in Russia resulting in devaluation of Russian rouble could have a substantial effect on profits from the region. Therefore, Carlsberg's plan is to hedge 70-90% of the foreign currencies other than the functional currency of the entities on a 12-month rolling basis (Carlsberg, 2017a). The company has no currency risk in their business in the EU as Denmark has a fixed exchange rate against the Euro (Spange & Toftdahl, 2014).

4.1.3 Social Factors

The social factors in a country can have an underlying effect on the demand for Carlsberg's products. This part will focus on population demographics in the key markets, and social issues that affect the beer and alcohol industry.

4.1.3.1 Population demographics

Population growth can be useful for companies, when deciding which markets to enter. A high growth in population would incline that there will be a high potential for future growth in sales. Another reason for this is that if the market is growing, companies will fight for new costumers, while if the population growth were shrinking companies would fight for existing customers (Ozimek, 2016).

Table 9 – Population growth (million) in Carlsberg's key markets 1960-2016
Source: own creation, population growth (World Bank, 2018)

Population Growth	1960	1970	1980	1990	2000	2010	2016	Avg.
China	667	22,6%	19,9%	15,7%	11,3%	5,9%	1379	15,1%
Denmark	4,5	7,4%	4,1%	0,4%	3,9%	3,9%	5,7	3,9%
EU	409	7,9%	5,0%	3,0%	2,1%	3,3%	511	4,3%
India	449	23,1%	25,9%	24,8%	20,7%	17,2%	1324	22,4%
Norway	3,5	8,1%	4,4%	5,0%	5,9%	8,9%	5,2	6,4%
Russia	120	8,8%	6,5%	6,5%	-1,0%	-2,4%	144	3,7%
Ukraine	42	10,3%	6,4%	4,0%	-5,8%	-6,1%	45	1,8%

Table 9 shows that in most of the key markets there is a stable population growth throughout the last 50 years, so small that it would not have huge effects on the product demands for a company. However, the high population growths that China has experienced, and India is still experiencing, could potentially have great effects on the underlying demand for a company's product.

4.1.3.2 Social issues

Beer and alcohol consumption is a controversial issue worldwide and there is a heavy burden on alcohol related problems. Within the European region of the World Health Organisation (WHO) alcohol consumption is estimated to be responsible for about 9% of the total disease burden, increasing the risk of liver cirrhosis, certain cancers, raised blood pressure and stroke (Rehn, et al., 2001). Alcohol consumption also causes the risk of many family, work and social problems such as violence, financial hardships, absenteeism, accidents and criminal behaviour (Edwards, 1994). The beer companies are constantly focusing their marketing campaigns towards these issues of responsible beer consumption, and not to drink and drive (AB InBev, 2017; Carlsberg, 2017a; Heineken, 2017). Marketing campaigns that are essential, because negative publicity regarding alcohol and beer can affect the sale and consumption of products (Carlsberg, 2017c). The global status report on alcohol and health (2014), suggests that there are more drinkers, drinking occasions and more drinkers with low-risk drinking patterns in higher socioeconomic groups, while abstainers are more common in the poorest social groups. However, people

with lower socioeconomic status appear to be more vulnerable to tangible problems and consequences of alcohol consumption.

4.1.4 Technological

The basic beer brewing process has not changed for hundreds of years, and new technological breakthroughs in brewing are few. However, there are advancements in production efficiencies and quality improvements, where most of the developments happen at a company level. The major brewing companies have made advancements in improving the production process through the reduction of usage of water and energy. Distribution channels have been improved using GPS systems to manage fuel costs and time (AB InBev, 2017). Many companies move towards the use of renewable energy in their production, packaging and distribution processes. The large brewing companies also have production facilities in different locations around the world, so merging them to share information and knowledge can be challenging. Therefore, the major companies have moved to implement IT technology, unleashing digital transformation across the companies that take away geographical barriers that could slow down production (Microsoft, 2017).

4.2 Industry Analysis (Porter's Five Forces)

To understand the state of the competition in the alcoholic beverage industry, it is evident to uncover the underlying factors that contribute to it. In this part, these factors will be analysed according to Porters' five forces (Porter, 1979). Michael Porter (1979) views the underlying forces that affects the strategy of a company within the industry as; supplier bargaining power, customer bargaining power, threats of substitutes, threats of new entrants and internal rivalry. When mapping these competitive forces, they underline areas of threats and opportunity within the particular industry. Additionally, the analysis can uncover the most significant industry trends and can guide a company to position itself within the industry, besides understanding opportunistic areas of diversification. Since Carlsberg is not only competing against other breweries, the scope of the market has been expanded to the alcoholic beverage industry, rather than only focusing on the beer industry.

4.2.1 Customer Bargaining Power

When examining the customers within the industry, they can be characterised into three categories. The first, being retail customers, the second being associated restaurants and bars (on-trade), whereas the third

is the end consumers (off-trade[5]). Since breweries and beverage conglomerates are focusing on the production, there is a tendency within the industry to sell to wholesalers and retail partners, who then resell to the end consumer. By allocating the sales function to the retail partners, it increases the risk of losing control over distribution channels, since the beverage companies are dependent on their retail partners to sell their products. This automatically gives the retailers a strong bargaining power, as they can pressure the beverage companies on prices, in order to have company's products in their portfolios and expose them to the end consumer.

Secondly, associated restaurants and bars, carrying beverage products also have significant bargaining power. These associates are able to pressure the beverage companies on price, since they can easily switch to another supplier. This again puts the beverage companies in the position of losing both sales and exposure within the market. To lower the bargaining power of the associates, the beverage companies engage in partnerships with exclusivity agreements that incentivise the bars and restaurants to sell specific products from specific brands on the long term; signing deals with yearly discounts and kickbacks on the products sold (Berlingske Business, 2012). In 2008, the strategy was criticised for endangering the competition in the market, since Carlsberg had a market share of more than 30% in Denmark. This resulted in a change in the strategy, which increased the bargaining power of the customers (Carlsberg, 2005).

The last type of customer in the industry is the end consumer, who consumes the beverages sold by the companies. Since the end consumer decides whether to consume the products or not, they have a substantial barging power over the beverage companies. End consumers can affect the sales, brand strategy and exposure by choosing not to consume the products. To decrease the risk of losing power to the end consumers, the beverage companies strive to position themselves within the reach of the consumer, which is accomplished by marketing and getting exposure from retailers and associates. Furthermore, it is evident at the beverage companies' focus on corporate social responsibility, which is increasingly becoming more important (AB InBev, 2017; Carlsberg, 2017a; Heineken, 2017; Royal Unibrew, 2017).

4.2.2 Supplier Bargaining Power

When at the supply chain of what is used to produce the products within the alcoholic beverage industry, there are mainly two categories of suppliers; Suppliers of raw materials and Suppliers of brewing

[5] Off-trade refers to the sales of beverages outside of restaurants and bars.

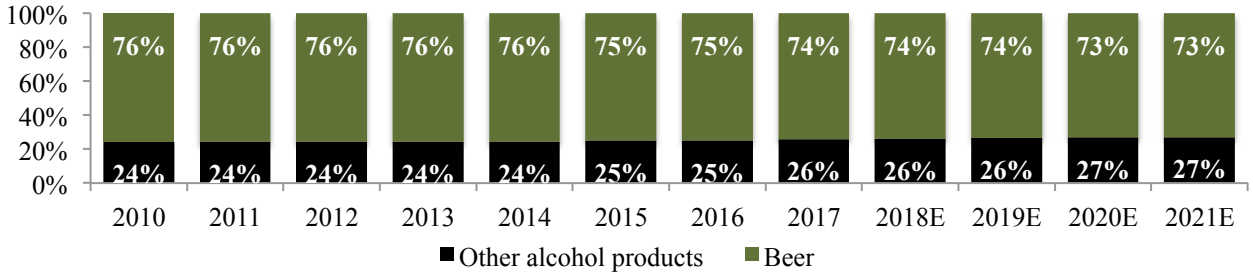
equipment. Examining the raw materials used in the alcoholic beverage industry, most of the materials are easily accessible (Meussdoerffer, 2009). This means that there is a natural high quantity of suppliers, supplying the materials. Since much of the raw materials are standardised, the switching cost between suppliers will be significantly low, which decreases the bargaining power of the suppliers. Additionally, it is evident that there is a trend within the industry, where the large beverage companies invest in their suppliers to yield better quality, logistics and control. Such strategy can be argued to both increase and decrease the power of suppliers in various areas. When investing in suppliers, it provides the buying company the opportunity to control prices of raw material and secure a steady supply for the production, to some extent. At the same time, integrating suppliers into the logistics systems makes it increasingly more difficult to switch suppliers for better alternatives (AB InBev, 2017; Carlsberg, 2017a; Heineken, 2017; Royal Unibrew, 2017).

From the analysis of the peer group, it can be argued that production of beer requires significantly high levels of assets. Brewing equipment requires substantial investments, which would give the suppliers of the equipment more leverage, when analysing suppliers bargaining power. It can be argued that investing in brewing equipment requires commitment to the suppliers. To switch between brewing systems would carry various costs, which in the end would make it difficult to change suppliers. Thus, it is argued that the suppliers of the brewing equipment have a relatively significant bargaining power in the industry (Boeing, et al., 2008).

4.2.3 Threat of Substitutes

While the beer companies in the analysed peer group can be viewed as competitors within the industry, other actors also compete within the alcoholic beverage market. When looking at the properties of beer, the drink solves consumer needs such as quenching the thirst, providing taste experience, being a social drink and the effect from the intoxication makes the drinker relaxed, happy and less restricted (DiSalvo, 2012). Anything that can replace any of these properties would eventually be a substitute to beer on a minor or major scale. First of all water and none alcoholic beverages can arguably be a substitute for some of the properties of beer, such as quenching the thirst and providing at taste experience. Following, spirits, cocktails, bottled drinks, ciders and other alcoholic drinks contests furthermore to substitute the specific properties of beer, such as providing the consumer with alcohol and being a drink for social events. It is evident that in the markets of America, Latin America, Europe and APAC, the market share of beer has been decreasing since 2010, whereas the market share of other alcoholic beverages have been increasing during the same period (Statista, 2016a).

Figure 23 – Substitute products
Source: own creation, based on (Statista, 2016a)



As seen in Figure 23, the worldwide market share of consumption of beer is decreasing, whereas the market share for other alcoholic beverages is increasing. This indicates a high threat of substitute products within the industry that are competing for market shares, searching to cater for the consumer's preferences.

4.2.4 Threat of New Entrants

As previously mentioned, being a company in the beverage industry requires significant investment in assets, which might act as an entry barrier for new entrants in the market. Furthermore, new entrants have to acquire the technology and the knowledge to produce beer that is in the preferences of the consumers. Since there are many actors within the industry, entering the market and competing with the large beer companies requires much more than only being able to brew beer, but also logistics, marketing and brand building. Competing against well-established brands in the industry also makes it difficult to enter the market, as the major brands have large marketing budget, which give them the ability to be within the consumer's reach. Although it seems as a tough market to enter, a trend of emerging microbreweries, brewing craft beer and taking market shares, is noticeable. As mentioned in the industry overview, there is a significant threat of losing market shares to new craft beer companies in spite of the market being difficult to enter. This trend, generated by switch in consumer preferences, creates a significant threat from smaller entrants, where many small breweries can acquire substantial market shares from the larger companies in the market (Morris, 2014).

4.2.5 Internal Rivalry

After examining the industry and uncovering tendencies, it is evident that there is a high level of rivalry. The improvements in logistics and technology has provided beverage company the ability to compete against each other on global scale, which results in a high level of competition for market shares (Meussdoerffer, 2009). As stated previously, the products in the beverage industry are not very price

elastic, which focuses the competition on diversification rather than on price (Nelson, 2013). Within this rivalry, it is evident, when examining the large marketing budgets from the major beer companies, that a method to conquer market shares is to influence consumer preferences by branding towards the various products. The same way the competitors in the industry compete for exposure and consumer accessibility, to make sure their products always are within a reach from the target consumer (Nelson, 2005).

Since the companies within the industry are mainly focussed on producing the products and expose the brand, it is common for the companies to sell their products through the same sales channels. This furthermore limits the opportunity to differentiate from other competitors and influence the sales strategy towards the end consumer. In addition to this, competitors use networks of associates, such as bars and restaurants to exclusively carry their products. This again contributes to competition of attaining the right exposure to the end consumer, which eventually can increase awareness in the market (Carlsberg, 2005).

Due to the stagnation of sales of classic lager beer in the industry, and the fact that the interest for craft beer has been increasing during the last decade, it is apparent that many of the major companies have acquired other companies to expand their portfolios, to secure market shares (Weissman, 2014). The trend of acquisitions within the industry can arguably be interpreted as way of the companies to work towards the strategy of optimising and minimising costs by economies of scale.

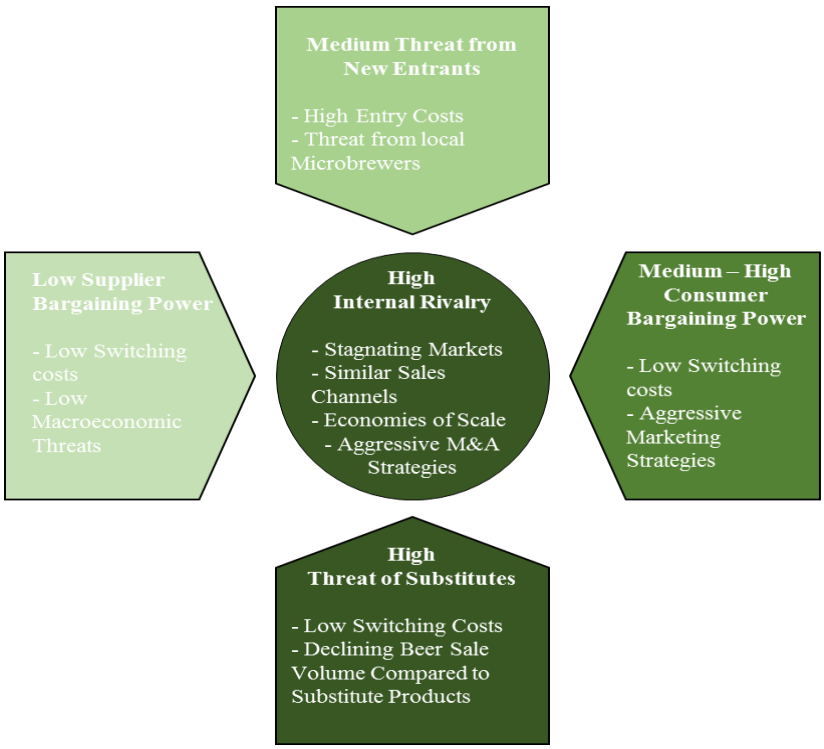
The performance in core operations, within the companies on the competitive market, can provide potential advantage for the individual peer. If a company does not operate its business on the same level as its competitors, the company's position in the market could be endangered. According to the analysed peer group, all companies seek to optimise their operations, supply chain and enhance innovation within, which is important to maintain the level of competitiveness.

When considering the different areas of competition between the companies, it is clear that all the mentioned factors contribute to the high level of internal rivalry. The strategic trends show a focus on diversification of products, economies of scale, high levels of advertising, optimisation in operations and the use of acquisition strategies to enter new markets (Dawar & Bagga, 2015).

4.2.6 Conclusion of Five Forces

To summarise the industry specific analysis, current trends and influential factors within the industry has been identified. To provide a better understanding on how these factors altogether influence the industry, their importance is presented in Figure 24.

Figure 24 – Porters five forces
Source: own creation, based on (Porter, 1979)



The factors that are less significant and provide the lowest threat for companies within the industry is supplier bargaining power. Compared to other factors the companies within the industry have a substantial control over their suppliers, which would arguably characterise the factors to have the lowest threat. Following, is the threat of new entrants, which is also limited due to the high costs of entering the market. Companies should not completely exclude this as a threat, since a trend in consumer preferences seem to favour microbreweries rather than the major beer brands. This could eventually become a considerable threat in the future. Additionally, consumers have a significant bargaining power, due to the low cost of switching to other products and brands. Companies within the industries attempt to reduce the threat by investing in marketing for their brands, to always be within the reach of the consumer. Furthermore, the companies within the industry have promotional strategies toward retailers and associates that incentivises them to be loyal to their products. The low switching costs increase the threat of substitute product significantly. This partially explains the fierce rivalry within the industry, where competitors fight for market shares by using large marketing budgets, within a market where the interest for beer is decreasing relatively to other alternatives. A main trend within the industry is the major companies' acquisition of

minor companies to expand product portfolio, and enter new markets. The rivalry is perceived as a high threat in the industry, which affects the companies within.

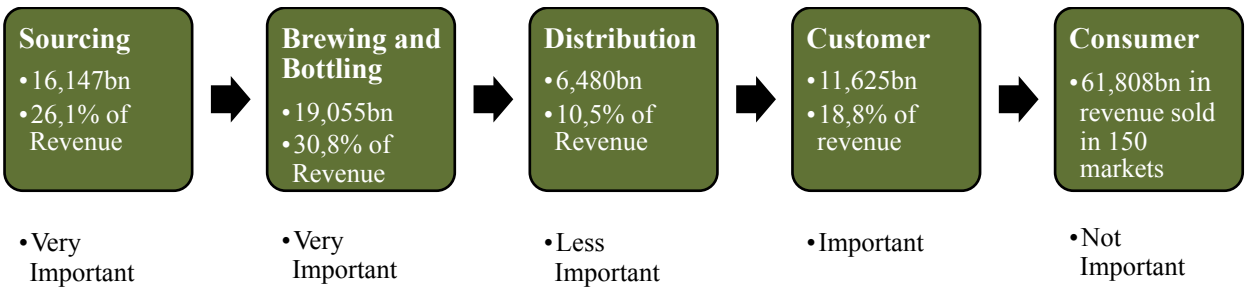
4.3 Internal Strategic Analysis (Value Chain Analysis and VRIO)

To examine potential competitive advantages in the past and future, we will conduct a value chain analysis of Carlsberg's value chain. Hereafter using a VRIO analysis of Carlsberg's strategy to identify the four attributes that a firm's resource must possess in order to become a source of sustainable competitive advantage.

4.3.1 Value Chain Analysis

The value chain is a process view of the organisation, seeing the organisation as a system made up of sub systems, all with inputs, transformation and outputs. Michael Porter's (1985) value chain model is a framework designed to identify potential sub activities (e.g. energy reduction, economies of scale, etc.) of competitive advantage within a primary activity (e.g. brewing, distribution, etc.) of the value chain. This, to better understand, where value is added or lost in the production process. Value is added if it improves services, increases efficiency or reduces cost in the given activity. Carlsberg's new strategy SAIL '22 (Ch. 2.1.5), has set out a detailed plan on how to create future value in their value chain. Setting goals to improve efficiency, and optimising its brewing, sales and distribution throughout the company, at both a national and regional level as part of the plan to free-up invested capital. Since the new strategy was set into action in 2015, a number of efficiency, optimisation and standardisation programs have been implemented that cover streamlining of processes and procedures across the whole value chain (Carlsberg, 2017c). Figure 25 shows Carlsberg's value chain, which consists of five main stages: sourcing (inbound), brewing & bottling (operations), distribution (outbound), customer (sales and marketing) and consumer (service).

Figure 25 – Carlsberg's value chain
Source: own creation of Carlsberg's value chain (Carlsberg, 2017a)



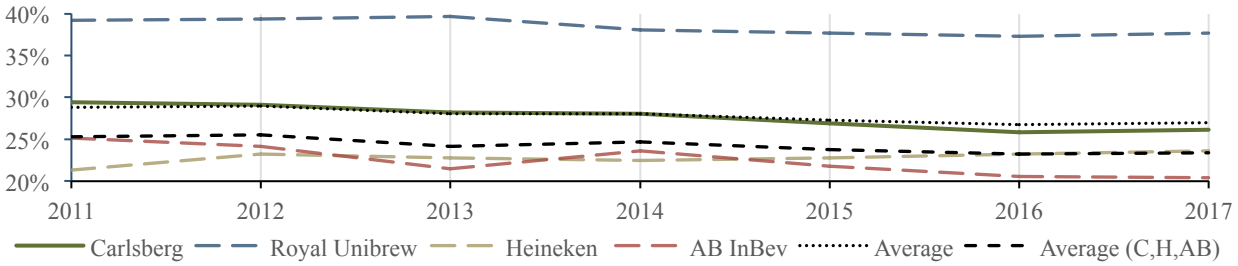
The rest of this section will analyse each step of Carlsberg's value chain by assessing the importance (internalisation), and value creating activities of each stage of their production process. The four main stages of the value chain amount to 86,2% of total revenue in 2017 (85,9% is the average for the period, which is similar for peer group, except AB InBev: 67,4%), the remaining percentage of revenue is allocated between financial activities, tax and profit. Where each stage is compared against the similar stages of the peer group's value chain, throughout the analysed period (2011-2017) (Appendix 12). This is done in order to see the relative average size of each stage in the peer group compared to Carlsberg, and where the company can improve value chain efficiency, and reduce costs to be more competitive. The comparison is done by comparing the cost of each stage as a percentage of revenue. The analysts are aware that there might be some deviations in how the peer group classifies the different costs across the different stages, but it will still give an indication on the relative size of each stage. A time series analyses of Carlsberg's value chain and the effect of their new strategy will also be assessed.

4.3.1.1 Sourcing (Inbound activities)

Sourcing is in Carlsberg defined as the process of interacting with suppliers, and ordering the raw materials for production. Where the CSC is responsible and handles the sourcing (Ch. 4.3.1.6). Meaning that Carlsberg is not self-sufficient in the growth or production of most of their raw materials (Ch. 2.1.4.3). Therefore, they rely on developing and maintaining close strategic relationships with their suppliers to ensure tighter quality control, competitive prices and better service (Carlsberg, 2018e). Raw materials that the company uses in the brewing process are barley (malt), hops, yeast and water. Carlsberg uses its own proprietary yeast, which is grown internally, whilst hops and malt are imported from farmers to obtain quality and variety. Packaging materials (aluminium cans, glass and PET bottles) are also bought from external suppliers. The prices on raw materials are affected by many factors such as competition, production, market growth & demand, regulations and other macroeconomic factors. Carlsberg use mostly long-term fixed-price supply contracts (futures) to ensure stable supply (70% of all barley supply is fixed), price and predictability (Carlsberg, 2017c).

Figure 26 shows that Carlsberg's material costs as a percentage of revenue have declined on average in the last seven years from 29,4 % to 26,1%, mainly due to a lower purchase price of grain, and higher stock of packaging materials in Russia (Carlsberg, 2017c). Even though Carlsberg's percentage of material costs is declining, they are still higher than their closest competitors of Heineken and AB InBev, indicating that there is room for improvement. The new strategy SAIL '22 (Ch. 2.1.5), has not manage to substantially increase efficiency or cost reduction since the implementation in 2015.

Figure 26 – Material costs as a percentage of revenue
Source: own creation, based on (Carlsberg 2011-2017, AB InBev 2011-2017, Heineken 2011-2017, Royal Unibrew 2011-2017)

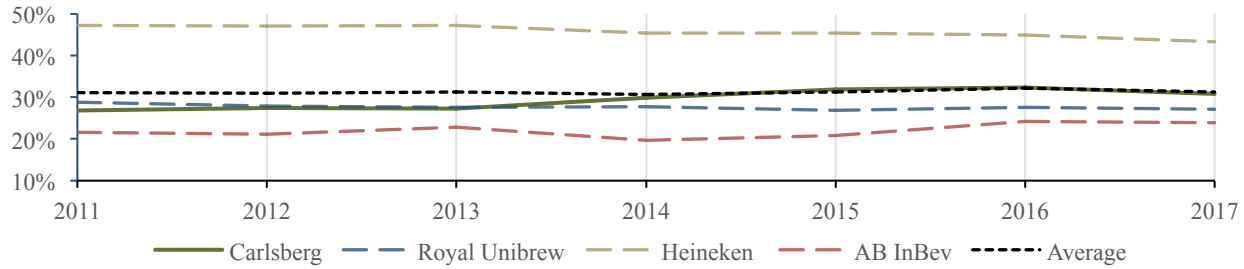


4.3.1.2 Brewing and bottling (operations)

The operations (production) process of the value chain is the most important stage in the creation of value, and is the essence of Carlsberg's organisation, where the brewing and bottling process is fully integrated across the company. Carlsberg brews its beer in 31 countries, and is constructed to meet the requirements and demand in the market, where individual production facilities vary widely in terms of production scale. The companies five larges production facilities have a combined production capacity volume of 41,9 million hl a year, and are located in the key market of Russia, whereas the largest single production facility (Baltika plant in St. Petersburg) has a production capacity of 8,6 million hl per year (Carlsberg, 2017c). The production function is responsible for the brewing network, where the main responsibilities is to ensure a steady supply of goods, quality of products, maintain equipment and produce products in the most efficient way (Carlsberg, 2018e).

Carlsberg also has a continuing focus on reducing waste, water and energy (using renewable energy) to reduce costs in their production (Carlsberg, 2017a). Significant value is created through taking advantage of economies of scale, and harmonising standardising and centralising functions and processes across markets. The production methods to brew different types of beer is very similar, consequently brewers in Carlsberg have some flexibility to allocate production between their facilities to reduce overhead and potential distribution costs. Another factor in the reduction of costs in later years is that Carlsberg in 2016 reduced its administration staff by 2,280 employees (Carlsberg, 2017c). Figure 27 shows Carlsberg's operations cost as a percentage of revenue compared to the peer group.

Figure 27 – Operation costs as a percentage of revenue
Source: own creation, based on (Carlsberg 2011-2017, AB InBev 2011-2017, Heineken 2011-2017, Royal Unibrew 2011-2017)

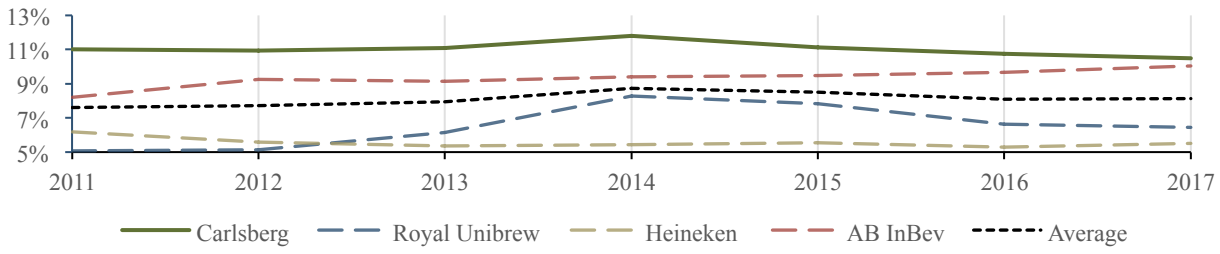


Carlsberg operations cost has decreased in the last year of around 2%, due to continued production efficiency improvements set out in the new strategy. The margin is better than that of Heineken (43,3%), but still above that of the market leader AB InBev (23,9%). The declining trend indicates that the production focus on efficiency gains and reduction of waste, water and energy has had a positive value creating effect for Carlsberg (Carlsberg, 2017c).

4.3.1.3 Distribution (Outbound activities)

The distribution function of Carlsberg's value chain is responsible for getting the finished products to the costumer in the most efficient way, whether the costumer is a wholesaler, supermarket, bar or restaurant. The function's main objective is to optimise warehouse networks, distribution and transportation flows after demand. Delivering the right products, in the right quantities, to the right time (Carlsberg, 2018e). Carlsberg's distribution network varies between markets. In the Western European market, and especially the Nordic markets, the service level requires direct delivery to retailers. Whilst the Asian and Eastern European markets are primarily served through wholesalers. The differences vary either because of legal reasons or because of historical market practise. The distribution process to retailers and customers are done by using trucks owned or leased by the company (Carlsberg, 2017c). Figure 28 shows Carlsberg's distribution costs as a percentage of revenue compared to the peer group.

Figure 28 – Distribution costs as a percentage of revenue
Source: own creation, based on (Carlsberg 2011-2017, AB InBev 2011-2017, Heineken 2011-2017, Royal Unibrew 2011-2017)

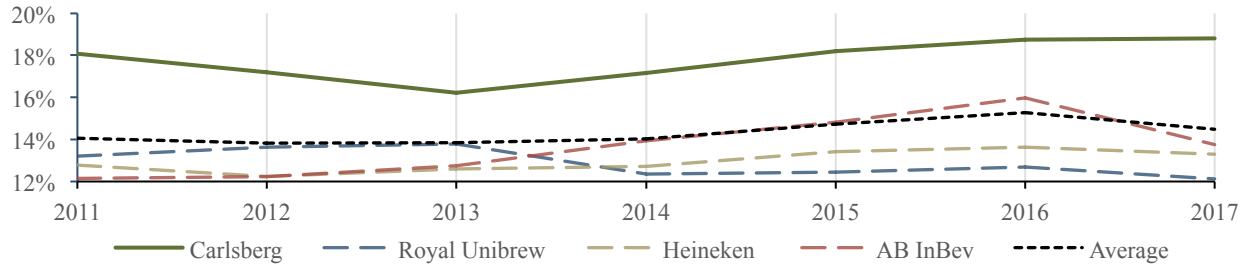


Carlsberg's average distribution costs are significantly higher than the rest of the analysed companies throughout the period. The company has though shown a positive trend in cost reduction the last couple of years, going from cost of 7,521bn DKK in 2014 to 6,480bn DKK in 2017, reducing the costs by 15% over the period (1,3% reduction compared to revenue) (Carlsberg, 2017a). The reduction is mainly due to centralisation of transportation operations, increased efficiency and productivity of the distribution network. Carlsberg is striving to improve their distribution efficiency and cost reduction even further in their new strategy. One measure is that the group in 2016 announced that they consider outsourcing their secondary logistics operations in the UK to reduce costs (Carlsberg, 2017c).

4.3.1.4 Costumer (Sales and Marketing)

The "costumer function" of the value chain is directed at becoming the preferred beer supplier of their costumers, which is done through marketing and sales. Marketing expenses consists of brand marketing and trade marketing. Brand marketing is investments in the company's brands, consisting of marketing activities such as sales campaigns, sponsorship, advertisements and in-store displays. Moreover, trade marketing consists of promotional activities directed at costumers, such as promotional materials and trade offers. Marketing expenses alone amounted to 9,7 % (5,98bn DKK) of revenue in 2017, lower than 2016 due to the UEFA EURO sponsorship. Sales cost expenses on the other hand consists of general sales activities, write downs of bad debt losses, sales staff expenses, and also depreciation and impairment of sales equipment, which amounted to 5,645bn DKK in 2017 (Carlsberg, 2017a). Figure 29 shows Carlsberg's sales and marketing expenses as a percentage of revenue compared to the peer group.

Figure 29 – Sales and marketing costs as a percentage of revenue
Source: own creation, based on (Carlsberg 2011-2017, AB InBev 2011-2017, Heineken 2011-2017, Royal Unibrew 2011-2017)



The figure displays that Carlsberg directs a bigger portion of their revenue towards marketing and sales initiatives, with the aim on getting market share by improving, creating and capturing customer value across core channels and customer segments. This will be conducted in line with the new strategy, through promotional strategies and pack-price architecture, to ensure value and competitive offers in the market (Carlsberg, 2017c).

4.3.1.5 Consumer (Service)

The consumer stage does not create value directly to the value chain (not an internalised part of the value chain), as the product is sold through the company's customers (wholesaler, supermarkets, etc.), and is therefore less important when assessing value through cost reduction and efficiency. However, as the consumer is the most important, when it comes to the demand for products, it is still and essential part of the future growth of Carlsberg. Carlsberg connects and communicates with the consumers through marketing in order to drive future purchases (Carlsberg, 2017a).

4.3.1.6 Supporting activities

Supporting activities, is by Michael Porter (1985), defined as secondary activities that discreetly support the primary activities (stages) of the value chain, to increase efficiency through the process and reduce costs. Procurement is centralised in CSC, located in Switzerland, and is responsible for buying all the raw material and packaging throughout the entire organisation. In addition, procurement is responsible for coordinating operations (transportation, facility management and brewing equipment) and sales and marketing in all of Carlsberg's key markets. The aim of CSC being to ensure a stable supply of input, manage risk, negotiated prices and enhance efficiency throughout the process (Carlsberg, 2018e).

4.3.2 VRIO Analysis

The VRIO analysis framework provides the ability to determine if the resources a company possess can contribute to a Sustainable Competitive Advantage (SCA) in the market. The framework was developed by Jay Barney (1997), with the purpose to furthermore contribute to strategy frameworks that defined strengths and value creation in companies. The VRIO framework explores the resources that enable the company to implement strategies that improve level of competiveness. These resources can be divided into; physical capital resources, human capital resources and organizational capital resources, but are compared on the same level within the framework to conclude what resources creates the best possible sustainable advantage. The VRIO model analyse the resources in four aspects; (1) does the resource create value? (2) is the resources rare? (3) is the resources imperfectly imitable? and (4) has it operationally been exploited? If the resources succeed in all aspects, it will provide SCA to the company. However, if the resources only fulfil three of the aspects it will provide the company with a Contemporary Competitive Advantage (CCA). Furthermore, if the resources only live up to one of the aspects, it will provide the company with a Competitive Parity (CP). Lastly, if none of the aspects are fulfilled the resources acts as a Competitive Disadvantage (CD) (Barney, 1997).

Throughout the strategic analysis multiple strengths/resources has been identified to create value for Carlsberg. In this section, these resources will additionally be analysed to investigate if these provide the company with SCA. Furthermore, additional examples of resources, which have not been a part of prior analysis, will also be listed if they are found to create value for Carlsberg. To include these will provide the reader with the best-nuanced understanding of the company's strategic baseline. The resources used for the analysis will be presented in each of the four parts of the framework. Due to the limitation of the thesis, only the most significant resources will be elaborated in the analysis. The rest will be presented in appendix 17. The resources that are present do not all have a SCA, but are chosen due to their importance for the company and the analysis, and is valued to have a significant impact on Carlsberg's performance.

4.3.2.1 Significant market share in the Baltic countries with large-scale local production

In the Eastern European and Baltic countries, including Russia, Carlsberg shows a significant presence through its own products such as Carlsberg beer, but also from acquired brands such as Baltika and Grimbergen. Just in the Russian market, Carlsberg was present with 31,9% of the market shares in 2017 (Carlsberg, 2017a). As previously described, Carlsberg has significant investments in the Eastern European market, which is due to local operations. This furthermore creates a strong leading market position compared to other competitors. It is expected that Carlsberg will not lose substantial market shares in Eastern Europe, and thus this resource is expected to have an impact on the company's development in the future.

For Carlsberg to possess the major market share within a market, and at the same time secure the company's position by producing locally, is valuable for the company. Carlsberg creates value by being within the reach of the consumer, but also evades import taxes and other duties by producing locally. Import taxes on alcohol can vary from 20% - 570% in Russia (Export, 2017). Being in control of the largest market share within the Eastern European market is arguably a rare resource for a company to have. Only Carlsberg has this position and when looking at the strategy from the comparable peer group, where the companies express that they do not intent to invest or pursue major growth within this market (AB InBev, 2017; Heineken, 2017; Royal Unibrew, 2017). For Carlsberg competitors to imitate the major market presence in Eastern Europe would require large investments, which seems unlikely. Other competitors would also be challenged to export products to a country such as Russia, since the import duties are significantly high. Thereby it can be argued that this resource is imperfectly imitable. Carlsberg has been utilising the resource of being present in the Eastern European market to increase sales, brand value and acquiring more products to its portfolio. Though the Eastern European Market declined in the

period of 2011-2017, due to regulations and taxes on alcohol, but Carlsberg seems to be adapting to the situation (Carlsberg, 2011-2017). Since the resources of having local presence and a high market share in the Eastern European market is excelling in all aspects of the VRIO framework, the resource can arguably provide Carlsberg with a SCA.

4.3.2.2 Brand/image

The Carlsberg brand and many of later acquired brands, which are now a part of the Carlsberg product portfolio, have been in plain sight and in reach of the consumer for more than 150 years (Carlsberg, 2017a). Being in possession of, and still developing on brands with such legacies, is perceived to be a resource that Carlsberg benefits from. The Carlsberg brand is expected to have a significant future impact on the company's operations, and is thereby being examined.

Using strong brands that are easily recognised and preferred by consumers is a driver that can increase sales, which creates value for Carlsberg. By using the different brands, Carlsberg can connect directly with the end consumers at different events and occasions, such as sports events, seasonal celebrations and festivals (Carlsberg, 2017a). Although, Carlsberg is engaging the brand on a global scale, being present in various communities, it is not a rare branding strategy. For example in Europe, Carlsberg became one of the head sponsors of UEFA in 2013, whereas AB InBev has been head sponsor for NFL in the US for even longer (Carlsberg, 2013). In 2016, Carlsberg started a new branding strategy, where the company pays tribute to its Danish heritage through new product design and new commercials (Roderick, 2016). By drawing parallels between the Danish heritage, such as high quality, old traditions and the brand of Copenhagen, it provides Carlsberg with authenticity, which arguably cannot be recreated by foreign companies. This new strategy increases the brands rarity and imperfect imitability. This example shows that Carlsberg is able to utilise the brand, unlocking its potential within the organisation, and thereby benefit from the gain. While the Carlsberg brand seems similar to other beer brands in many ways, the way that Carlsberg initiates the new strategy, focusing on its Danish roots and heritage, is a resource that provides the company SCA.

4.3.2.3 Large diversified product portfolio

Even though Carlsberg's portfolio consists mainly of older brands, there is also a significant diversification. Within the company's portfolio, the various products cover all segments of the beer industry. Although, the sales of spirits are taking significant market shares from the beer market, Carlsberg does not produce any spirits. Being able to decrease risk and cater to a broader audience by

having a diversified product portfolio is seen as a significant resource that affects Carlsberg's performance.

A diversified portfolio of products increases the likelihood of targeting consumer preferences, and decreases the likelihood of falling behind in innovation of products, thus miss opportunities within the markets. Furthermore, having multiple products in the portfolio would decrease the overall risk of default, if a product underperforms. This provides value for the company and makes the company able to develop alongside with the market. Compared to the peer group it is not a rare sight to have many products in the portfolio. For example, Heineken carries more than 250, AB InBev carries more than 400, whereas Carlsberg carries around 140 products (AB InBev, 2017; Carlsberg, 2017a; Heineken, 2017; Carlsberg, 2018f). On the other hand, as described previously, Carlsberg has a focus in the company's market strategy to target Eastern Europe, which is reflected in multiple brands within the portfolio. Since all brands are unique, it will be difficult to create a similar brand portfolio with the same exposure in the Eastern European markets. This arguably defines the portfolio as rare. Furthermore, Carlsberg is experiencing the highest growth in the sales of non-alcoholic beer segment with a 15% increase in 2017 (Carlsberg, 2017a). With a reference to the brand /image and Carlsberg's presence in the Eastern Europe markets, it will be difficult to imitate the same product portfolio, without making substantial investments. Thereby it can be argued that the diversification of the portfolio is unique and imperfectly imitable. It is evident that Carlsberg is experiencing a significant increase in all minor brands in the portfolio, which would be a sign on utilising its potential (Carlsberg, 2017a). Considering that Carlsberg does not have as large of a product portfolio as its peers, but still the diversification of the portfolio is unique and difficult to imitate, it gives the company a CCA.

4.3.2.4 Technology and innovation within products, production and logistics.

Technology within the production and logistics in the beer industry is a noticeable resource, when it comes to staying competitive in a stagnating market. Since the global supply of beer create a high level of competition, companies have to diversify themselves and optimising their way of operating their businesses. From various annual reports, it is evident that Carlsberg is focusing on three areas, when developing new technologies, which are product, production and logistics (Carlsberg, 2011-2017). The technology within these areas is perceived as a significant resource for Carlsberg.

Due to the high level of competition, Carlsberg is focusing on innovation and development of products and accessories[6] within the portfolio. The high level of innovation can be seen when looking at the development of new trends. For example, Carlsberg was already adapting to the new trend of non-alcoholic beers back in 2013, by introducing the Carlsberg Nordic, where none of the other major companies such as AB InBev or Heineken at the time mentioned the segment to be a future trend (AB InBev, 2017; Carlsberg, 2017a; Heineken, 2017). Being innovative is not seen as a rare resource, since all major companies focus on innovating their product, but imitating innovation is difficult, since it arguably requires the right people within the organisation.

Selling a product in the consumer's taste, developing the production to improve quality, cut costs, and optimise logistics are all areas that creates value for the Carlsberg. On the product side, it is not rare to see investments in improving products, but factors such as patents for different technology can distance the companies from each other. In 2016, Carlsberg filed nine patent applications for technology within the development of products and production (Carlsberg, 2016b). Although patents can secure the technology for Carlsberg, some patents have an expiration date, which means that other companies can use the technology thereafter (Venner Shipley, 2013). In the long term, this makes the technology imitable, whereas on the short run the company will have an advantage.

Additionally, Carlsberg is also investing in new technology to improve logistics and unlock synergies between breweries. Since Carlsberg's corporation consists of various acquired breweries, there has not been a standardised IT system, nor logistics system. Carlsberg implemented together with Microsoft in 2012 a standardised IT system, where all companies within Carlsberg were able to better communicate and share resources (Microsoft, 2017). Such integration of systems is rare within in beer industry. Although its rarity it is not imperfectly imitable. Other large beer companies are able to build a similar system, but since Carlsberg has fewer facilities within the corporation, compared to AB InBev and Heineken, it will arguably be a greater task for these companies to imitate the system.

Looking at the product, production and logistics, altogether Carlsberg utilises the potential within the organisation and benefits from the gain. Although, technology in some areas is rare and difficult to imitate, it cannot be argued that this resource provide a SCA. Other major beer companies will be able to invest in similar technology, and much of the technology developed, can only be patented for a short amount of time. Furthermore, other companies are also able to innovate within their organisation, which also does not contribute to a SCA. Thus gives Carlsberg a CCA.

[6] Brand accessories are promotional equipments such as, restaurant interior, beer tap systems and cooling systems.

4.3.2.5 Agile Company Structure

Throughout the thesis, it has been presented how events in the market have affected Carlsberg, and how Carlsberg has responded to these events by immediately adapting the strategy to the situation. Examples of events are; the increase in taxes in Eastern European markets, the change in consumer trends, adapted to by the implementation of SAIL '22. Having an agile company structure that can adapt to changes is seen as resources that will benefit the company's performance in the future.

Being able to quickly adapt to change and adjust the strategy can save the company costs and eventually make it possible to benefit from new rising trends. Since the industry is dominated by major companies, there have been cases of lack of flexibility, due to the large size of the companies and their brands. One example could be the sales of Bud light within the US. The sales of the beer have steadily decreased during the last decade, and AB InBev cannot make a turnaround. Compared to Carlsberg's branding strategy, the company is more able to change an eventual downturn in its brands (Roderick, 2016). Furthermore, underlining Carlsberg's ability to adapt to change, the implementation of the SAIL '22 strategy can exemplify the statement. Two of the main areas of the SAIL '22 strategy were to strengthen the core and improve profitability. Although sales have decreased in the period after the implementation of the strategy, NOPAT-margin, ROIC and ROE have increase. Considering there is a plausible connection between the strategy and the company's performance, it looks like Carlsberg was able to integrate the new strategy and execute it within a short period of time (Carlsberg, 2016a).

It is not impossible for other companies to imitate the resources of having an agile company structure, but it requires investment and change of mentality of the employees within. Already Heineken is focusing on implementing systems that makes the company more flexible and less vulnerable to future changes (Heineken, 2017). Carlsberg's agile company structure is already showing benefits. This can be seen, when Carlsberg implemented SAIL '22 in 2015, which came with major changes in many areas of the company. Although the resource of having an agile company structure can be found in the industry, and is not impossible to imitate, it would be argued that Carlsberg has a CCA in this area.

5. SWOT

To conclude the strategic analysis and create a bridge to the financial analysis, the findings will be presented in a SWOT analysis. The SWOT analysis combines internal and external environments in one assessment, and evaluates the Strengths, Weaknesses, Opportunities and Threats (Mintzberg, et al., 1998).

5.1 Strengths

Throughout the financial and strategic analysis, various company specific strengths have been identified. Some of the major strengths are Carlsberg's market presence within the Eastern European markets. It is clear that Carlsberg dominates the market, which makes it difficult for other major brands to enter. In order to grow within present markets, it is important to have control over the company's value chain. In this instance, Carlsberg internalises the whole process of the beer production, all the way from partnerships with suppliers of raw material to distribution. The broad control over the company's value chain is possible due to innovation of technology within the company. Carlsberg has implemented systems together with Microsoft to easier consolidate and streamline all facilities within the organisation. This optimises and unlocks synergies in both production and logistics. Furthermore, Carlsberg is focusing on innovation and the development of new products and production methods, which creates value for the company, since Carlsberg has been seen as a first mover in various areas. Carlsberg's main market is Europe, where the company is naturally hedged from currency fluctuations, since the majority of the countries within Europe also are a part of the European Monetary Union. At the same time Carlsberg's origins of being a brand from Copenhagen Denmark, is a major resource, since it provides a quality stamp and perception of brand authenticity when presented to the consumers.

Additionally, Carlsberg has an agile organisation that can adapt to changes within the market and changes within its own organisation, which gives the company an advantage compared to other major beer companies. Although Carlsberg is finance from 70% equity from public stock, the company has 75% of the voting rights. This eliminates the risk of a hostile takeover from other companies within the industry, which could be a threat considering the trend of mergers and acquisitions within the industry.

5.2 Weaknesses

When looking into the company's historical profitability, it is evident that Carlsberg underperforms compared to its peers. Even though Carlsberg operates on a large scale, thus benefitting from economies of scale, in comparisons to Royal Unibrew, the financial analysis shows an overall underperformance in

all computed ratios, such as NOPAT- margin, ROE, ROIC and ATO. Comparing Carlsberg to Heineken and AB InBev, the same performance is evident, except for ATO, where Carlsberg shows a higher ratio compared to AB InBev. This could indicate that the Carlsberg is not able to fully utilise its size to create significant gains from economies of scale. Furthermore, it is apparent that Carlsberg generally has a higher cost of materials compared to the peer group, even though all companies in the peer group creates values within the same areas of the supply chain and invest in their suppliers. This means that Carlsberg does not have a radically different approach to its suppliers, but still carries higher cost on materials. In addition, to this, it is evident that the Carlsberg also carries a high level of sales costs compared to revenue. This indicates that Carlsberg in not efficient in generating sales considering the amounts invest compared to the peers. When investigating Carlsberg's main markets, almost all of them have matured, or show a sign of future decrease or stagnation in sales. Markets such as Western and Eastern Europe show this tendency. Emerging markets such as the Americas and Africa, which are expected to grow, Carlsberg is not present in. Considering the market is experiencing growth in substitute products such as spirits and other alcoholic beverages, that take market share from the beer market, Carlsberg does not have any of these products in the company's product portfolio other than one variety of cider. This is seen as a weakness, since the company will lose market share according to the development of this trend. Additionally, it seems as Carlsberg is deviating from a non-optimal capital structure, which eventually will creates less value for shareholders. This is also a weakness in a competitive market.

5.3 Opportunities

Although, craft beer is threatening the sales of mainstream lager beer, it is also an opportunity to expand the product portfolio and establish Carlsberg within new markets, before the competitors. Since the growth in craft beer is trending globally, it also provides the opportunity to enter markets, where major competitors are already present. Considering the threat of new substitute products, it also creates opportunities for Carlsberg to expand the product portfolio to other products than beer. Following the decrease and stagnation in many Carlsberg's main markets, growth is expected in Ukraine after the crisis and an even more significant growth in most Asian countries, due to high levels of GDP. Additionally, it is expected that inflation in many of Carlsberg's markets will be stabilised towards 2022, which could yield better profits. Internally, Carlsberg invest in innovation and technology that can seize the opportunity of developing new products, optimising the company's resources and furthermore increases knowledge sharing. Since Carlsberg is not performing well compared its peers and does not utilised the

full potential of economies of scales, there are opportunities in optimising the company's operations to a competitive level, by decreasing costs of sourcing, production, sales and logistics.

5.4 Threats

It has been identified through the analysis that the consumption for lager beer in the market is decreasing. Since Carlsberg's largest assets within the product portfolio is lager beer, it is viewed as a significant threat towards the company's future operations. In addition to this, the lager beer is also being threatened by the growth in craft beer. Although, craft beer is mainly produced by local microbreweries, the numbers of breweries amounts to a significant threat towards the sales of mainstream beer. At the same time, more problems about alcohol abuse are getting more attention, where in some countries alcohol abuse is an epidemic. This gives the beer, as a consumption product, a bad reputation, which could have an impact on the global beer market. Because of this, there is a high risk of political interference to control the consumption of alcoholic products. In Russia, there have been multiples examples of adding additional taxes on alcoholic products to minimise the consumption. Additional laws and taxes on alcoholic products is a significant threat towards Carlsberg, since it can influence the company's earnings over night. Furthermore, internal rivalry in the industry is a major threat towards Carlsberg. Due to the global supply of beer has increase, but the demand has been stagnating, major beer company's fight for market shares in all markets. As seen in the last decade major beer companies are able to quickly establish themselves in new markets by acquiring companies, which is also a threat. Additionally, the market experiences a high level of substitute products that also obtains market shares. This indicates that there is a change in consumer preferences, which will affect the beer industry**.**

Table 10 – SWOT summary of key factors
Source: own creation

Strengths	Weaknesses	Opportunities	Threats
Large marke share Russia	High operation Costs	Expand product portfolio	Changing consumer prefrences
Control in value chain	Economies of Scale	Asia	Decreasing sales volumes
Technology	Precent in growth markets	Inovation and Knowledge	Growth in substitute products
Product development	Product differenciation	Reduce operation costs	Microbreweries
Fixed exchange rate with EU	Capital structure	Production efficiency	Alcohol related issues
Strong reputation		Raw materials	Political regulations
Agile company structure		Craft and speciality beer	Competitors
Majority of voting rights			Mergers and aquisitions

6. Forecasting

The forecast of Carlsberg's realistic future performance will be based on the assumptions and estimates (value drivers) discovered in the financial and strategic analysis chapters (chapter three and four), as well as company and industry information in chapter two. This chapter will use the discovered information to better obtain a realistic forecast, and to explain the individual changes in forecasted line items. The forecast will be conducted for the next five years, as this will mirror Carlsberg's predicted period of change in their new strategy SAIL '22 (2.1.5). Supported by the fact that the beverage industry is a mature industry with stable growth rates. In addition, the quality of information available on growth and trends past the forecasted period becomes less accurate. Indicating a limited need for a longer forecast period, before reaching a steady state in the terminal period thereafter. The forecast will follow Petersen and Plenborg's (2012) sales driven approach, where the accounting items such as operating expenses and investments are forecasted based on the expected level of activity in revenue growth. The forecast will focus on a realistic scenario of future growth for Carlsberg. Where the realistic scenario will be thoroughly explained throughout the section (Appendix 18-21), as this will form the basis for the valuation and sensitivity analysis in the next chapter. Whilst there will also be an assessment of a realistic and pessimistic scenario related to growth in ROIC at the end of the chapter.

6.1 Realistic Scenario

The realistic scenario is the estimated predicted future performance of Carlsberg, based on previous conducted financial and strategic analysis, and expected market outlook for the industry.

6.1.1 Pro Forma Income Statement

This section will provide a justification and explanation on the predicted future growth or changes in accounting items in the pro forma income statement of Carlsberg. First, the revenue growth will be assessed, which is the main source of future growth for the company, before the changes in the rest of the operating expenses will be justified.

6.1.1.1 Revenue

Revenue is by Petersen and Plenborg (2012) defined as a function of the underlying market growth and the ability to deliver competitive products relative to peers. As mentioned in the market outlook (Ch. 2.3), most markets have been showing declining trends in volumes sold, whilst on the other hand revenues have been increasing. Whereas especially the Western European and Eastern European markets have been

showing a slight decline in volume growth, stable at best. Even though the Asian market is showing a stagnated growth, it is still the largest beer market in the world, which can provide opportunities (Ch.2.3). The declining trend is mostly due to an increasing interest in speciality and craft beers, as well as substitute products (Ch. 4.2.3) that have acquired market shares from the larger brands (Ch. 2.2.4). Table 11 shows Carlsberg's historical and forecasted trends in volume and revenue growth for the company. The historical trends show that both volumes sold and revenues have been declining in later years for Carlsberg, whilst organic growth have been mostly stable throughout the period.

Table 11 – Historical and forecasted revenue and volume growth of Carlsberg
Source: own creation, based on **(Carlsberg, 2010-2017)**

Revenue / Volume	Historical Value Drivers							Forecasted Value Drivers					Average
	2011	2012	2013	2014	2015	2016	2017	2018E	2019E	2020E	2021E	2022E	Historical
Volume growth	3,19%	1,15%	-0,07%	3,06%	-1,41%	-2,16%	-4,13%						-0,05%
Volume	137,90	139,50	139,40	143,80	141,80	138,80	133,30	133,30	133,30	133,30	133,30	133,30	
Organic growth	6,00%	3,00%	1,00%	2,00%	2,00%	2,00%	1,00%						2,43%
Growth								**0,49%**	**0,97%**	**1,46%**	**1,94%**	**2,43%**	
Revenue growth	5,84%	5,73%	-0,97%	-3,07%	1,31%	-4,19%	-1,29%	0,48%	0,96%	1,44%	1,91%	2,37%	0,48%
Revenue	63,561	67,201	66,552	64,506	65,354	62,614	61,808	62,108	62,712	63,625	64,861	66,437	

Carlsberg's revenue growth in the forecasted (explicit) period is determined in this forecast by the average historical organic growth throughout the analysed period (2011-2018), where there will be an even increase towards the average organic growth. The reason for forecasting with an even increase is that it is believed that the implementation of the new strategy and showing results from this will take some time, especially after the decline in the last couple of years. The first forecasted year is predicted to have a revenue growth of 0,49%, which is similar to the average growth in revenue for the historical period (0,48%), before growing by another 0,49% every year for the next 4 years. Reaching the average organic growth rate of 2,43% in year five. The organic growth rate is used in the forecast as this best reflects Carlsberg's underlying performance and strategy of "strengthening the core", where the objective is to focus on growing revenue organically in the markets were they are already present. Markets where they have made substantial investments (e.g. restructuring, and improving efficiency) and adjustments (e.g. transform business in Russia) in recent years (Carlsberg, 2017a, p. Ch. 2.1.5). By ignoring possible acquisitions in the estimated future growth, the predictions will give a clearer view of the profitability and financial stability for Carlsberg. As companies that grow organically in line with the economy of its markets should generate sufficient cash flow surpluses to repay its debt (Petersen & Plenborg, 2012).

By applying the organic growth in this way the revenue will grow from 61,108bn DKK in 2017 to 66,437bn DKK in 2022E, a total increase in revenue of 6,97% in the forecasted period, before reaching a period of stable growth in the steady state thereafter (terminal period). Showing a potential realistic growth in revenue that is in line with historical performance, the new strategy, and market outlook and conditions.

Table 12 shows the growth rate in the terminal period (period of steady state), which has been based on the overall GDP market growth in Carlsberg's key markets (table 7, Ch. 4.1.2.1).

Table 12 – Terminal period growth for Carlsberg
Source: own creation, based on (Carlsberg, 2010-2017 (International Monetary Fund, 2017a; Asian Development Bank, 2011))

Terminal Period Growth	Historical Value Drivers							Forecasted Value Drivers					Average
	2011	2012	2013	2014	2015	2016	2017	2018E	2019E	2020E	2021E	2022E	2018E-2022E
Western Europe													
GDP Growth	1,80%	-0,40%	0,30%	1,80%	2,30%	2,00%	2,30%	2,10%	1,80%	1,80%	1,70%	1,70%	1,82%
Share of revenue	58%	56%	57%	58%	60%	60%	59%						
Eastern Europe													
GDP Growth Ukraine	5,50%	0,20%	0,00%	-6,60%	-9,80%	2,30%	2,00%	3,20%	3,50%	3,70%	4,00%	4,00%	3,68%
GDP Growth Russia	5,10%	3,70%	1,80%	0,70%	-2,80%	-0,20%	1,80%	1,60%	1,50%	1,50%	1,50%	1,50%	1,52%
GDP Growth													2,11%
Share of revenue	31%	30%	29%	22%	17%	16%	17%						
Asia													
GDP Growth China avg. 2021-2030 (5%, weighted at 55% market share)													2,75%
GDP Growth rest of key markets in area avg. 2021-2030 (Weighted at 45% market share)													1,70%
GDP Growth													4,45%
Share of revenue	11%	14%	14%	19%	23%	24%	24%						
Terminal Period Growth													**2,50%**

The terminal period growth is calculated by taking the forecasted GDP growth rates in Carlsberg's key markets divided by the share of revenue percentage in the given market. For the Western European market the GDP growth is estimated to be an average 1,82% in the next five years, which is the same for the key markets of Denmark, Norway and the EU as a whole. Whilst for the Eastern European market, the GDP growth is calculated to be 2,11%. Basing it on the expected growth of the two key markets in region, Russia (67% of revenue in the eastern European market) and Ukraine (20% of revenue in the eastern European market), dividing the GDP growth on their share of the total revenue generated in the region. The remaining percentages of revenue in the region are split accordingly between the two. The Asian market growth is calculated as the expected GDP growth all of Carlsberg's Asian markets, where China is the key market in the region and focus for growth in their new strategy (Ch. 2.1.5.2). Even though the Chinese GDP trend is showing a declining over the years, the markets importance and revenue share for

Carlsberg has been increasing. The increase is expected to continue as the company has a focus on growing in the market, therefore the future growth of 4,45% in the Asian market is seen as realistic. Where the likely market growth and GDP decline will offset each other and become a likely future growth rate in the market. Based on these calculations and assumptions the future long-term terminal growth of Carlsberg is expected to be stable at 2,50%, in line with the future economic GDP growth of their key markets. Since it is challenging to estimate a long-term growth, Petersen and Plenborg (2012) argues that using GDP can provide a good estimate.

A terminal growth of 2,50% is higher than the average growth rate in the forecast period, which indicates that the analysts expect a higher growth in the long run than in the forecast period. To furthermore support the use of 2,50% as the long term growth rate, it is evident from looking at the growth in the historical period that Carlsberg has experienced a previous growth significantly higher than 2,50% per year, although the Company's decline in 2015, due to the downturn of the Russian market. Additionally, Carlsberg has changed management and implemented a new strategy, SAIL'22, which has a focus on growth in key markets, such as Asia. All Asian countries Carlsberg operate in, are expected a growth in GDP higher than 2,50%. China, weighting 55% of the Asian market is expected a growth of 5%, which is anticipated to be a key growth driver for the future (Carlsberg, 2017a; Asian Development Bank, 2011)[7]. As seen from Carlsberg's annual rapport (2017a), the company is already present in many of the Asian countries and will focus on growing in these markets in the future. Already being established in these markets benefits the growth projection, since Carlsberg does not have the risk of entering a new market with established competitors. In spite of the expected decrease in sales of beer in China, Carlsberg is increasing its portfolio with other beverage products that could gain market shares from the increasing "other alcoholic beverage" segment. This furthermore argues for the company's ability to adjust in the market to pursue new opportunities, and gain market shares.

As seen in Table 13 the average growth in revenue for the individual peers during the budget period is higher than the expected future growth for Carlsberg.

[7] These projections are from 2011, but recent studies shows that the actual numbers between 2011-2017 have are matching the projections or showing higher growth (Asian Development Bank, 2017). The analysts find the data from 2011 sufficient to use, due to this argument.

Table 13 – Average revenue growth of peer group
Source: own creation, based on (Carlsberg 2010-2017, AB InBev 2011-2017, Heineken 2011-2017, Royal Unibrew 2011-2017)

Growth peer group	2012	2013	2014	2015	2016	2017	Average
AB InBev	1,79%	7,96%	8,22%	-7,93%	4,20%	19,36%	5,60%
Heineken	6,85%	4,27%	0,28%	6,11%	1,35%	5,01%	3,98%
Royal Unibrew	-0,02%	23,45%	26,01%	-0,39%	4,86%	0,69%	9,10%

While this does not implicitly state that Carlsberg would experience the same growth for the future, it is worth noticing that there is a general trend amongst the peers. Since the revenue growth averages of all peers are significantly higher than the expected long-term growth for Carlsberg, it supports the argument that a terminal growth rate of 2,50% is a realistic scenario.

6.1.1.2 Operating expenses and income before tax from associates

Table 14 shows the historical and estimated changes in Carlsberg's operational expenses for the forecasted period as a percentage of revenue. The justification and assumptions of changes in each of the underlying item lines will be discussed underneath.

Table 14 – Operating expenses as a percentage of revenue (historical and forecasted)
Source: own creation, based on (Carlsberg, 2011-2017)

Operational Expenses	Historical Value Drivers							Forecasted Value Drivers					Average
	2011	2012	2013	2014	2015	2016	2017	2018E	2019E	2020E	2021E	2022E	Historical
Cost of sales	45,91%	46,23%	46,22%	46,25%	46,43%	44,60%	43,78%	43,53%	43,27%	43,01%	42,76%	42,50%	45,63%
Sales and distribution	27,92%	28,01%	26,93%	27,81%	27,99%	27,85%	27,71%	27,74%	27,74%	27,74%	27,74%	27,74%	27,74%
Administration expenses	5,95%	5,98%	6,22%	6,42%	6,29%	7,61%	7,14%	7,01%	6,88%	6,76%	6,63%	6,50%	6,51%
Other income and expenses	0,56%	0,37%	0,19%	0,69%	0,36%	0,32%	0,18%	0,38%	0,38%	0,38%	0,38%	0,38%	0,38%
Income before tax from associates	0,27%	0,17%	0,16%	0,63%	0,56%	0,52%	0,42%	0,39%	0,39%	0,39%	0,39%	0,39%	0,39%

Cost of sales has in the historical period remained stable at an average of 45,63% of revenue. However, after the implementation of the new strategy SAIL '22 there has been a decline trend in cost of sales as a percentage of revenue. Cost of sales includes all the cost of raw materials bought to the company, production costs and direct staff costs related to these activities (Carlsberg, 2017a). The declining trend is expected to continue throughout the forecasted period, as Carlsberg through their new strategy has set out clear objectives to excel in improving efficiency and quality in the value chain. In addition, increasing their focus on reducing waste, water and energy in the production process. Standardising and centralising functions and processes are also a supporting factor in increasing efficiency throughout. Furthermore, material costs have declined through the historical period, further indicating that the cost will decrease

(Figure 26, Ch. 4.3.1.1). The forecasted period is believed to decrease by a realistic 0,26% per year, to a more stable cost of sales, amounting to 42,5% of revenue in the terminal period.

Sales and distribution costs as a percentage of revenue have been very stable through the historical period, fluctuating between 26,93% and 28,01%. Even though there has been an increased focus on reducing cost in this item through the value chain. Only distribution costs have shown a declining tendency from 2014, reduced by 1,3% compared to revenue, mostly due to the centralisation of transportation operations (Figure 28, Ch. 4.3.1.3). The company has proposed to outsource parts of the distribution process to further reduce costs, but as this is still in the planning stages, it will not be taken into consideration. On the other side, sales and marketing cost, which make up the largest portion of the cost item, have shown an opposite trend since 2013. The increase in sales and marketing is mostly due to an aggressive marketing strategy to gain market share in the mature European markets. Based on this it is believed that sales and distribution will remain stable in the forecasted period at the average 27,74% of revenue.

Administration expenses went up from 5,95% in 2011 to 7,61% in 2016, but declined last year due to the new strategy and the reduction of 2.280 employees in 2016 (Ch. 4.3.1.2). The new strategy focuses on cost reduction in the segment of "funding the journey", where reduction in all stages of the value chain and value management cost are considered key areas (Ch. 2.1.5.1). Thus, after last year's decline and continuous focus on cost reduction, its believed that administration expenses will gradually return towards the historical average of around 6,5% in five years' time.

Other income and expenses is mostly gains and losses on disposal property and equipment, and is only around 0,38% of total revenue, where in 2017, total other income and expenses amounted to 113m DKK (0,18% of revenue) (Carlsberg, 2017a). Due to the relativity insignificant effects on the overall profits and the stability through the historical period, other income and expenses is predicted to stay around 0,38% of revenue in the forecasted period.

Income before tax from associates amounted to 262m DKK in 2017, a total of 0,42% of revenue. The investments in associates and joint ventures have remained stable for the last couple of years around 4bn DKK (Carlsberg, 2017a). With Carlsberg's focus on growing organically, the income is predicted to remain at the average 0,39% of revenue in the future.

6.1.1.3 Special items

Special items have fluctuated between a high 2,33% , to a low -1,37% in the historical period, averaging -0,13%. Whereas, it consist mostly of restructuring and termination benefits, and the costs are not significantly large (Carlsberg, 2017a). Special items are expected to remain stable at the average for the forecasted period, as substantial investments have been made and no new additional measures are planned, where only minor changes are expected for the next couple of years.

6.1.1.4 Depreciation, amortisation and impairment losses

As previously, mentioned, high impairment of brand expenses of the Baltika brand in 2015 and 2017, as well as goodwill in China in 2015 has been removed from the forecast and analysis, to get a better picture of Carlsberg's performance. Table 15 shows depreciation expenses, which are calculated as a percentage of property, plant and equipment, and have historically been amounting to around 3-5bn DKK (15,27% of PPE). The calculated historical average excludes 2015 and 2016 due to abnormally high restructuring cost, as an effect of the challenges in Russia and the decline in sales volumes (Ch. 4.1.1.2). The additional expenses in those two years are assumed a onetime investment to improve future performance. In addition, costs went down in 2017. Based on this, depreciation is expected to further decrease towards the average of 15,37% in the next couple of years.

Table 15 – Depreciation as a percentage of property, plant and equipment (PPE)
Source: own creation, based on (Carlsberg, 2011-2017)

Depreciation	Historical Value Drivers							Forcast Value Drivers					Average
	2011	2012	2013	2014	2015	2016	2017	2018E	2019E	2020E	2021E	2022E	Historical
Depreciation	12,39%	14,93%	13,39%	17,26%	26,54%	23,12%	18,89%	18,19%	17,48%	16,78%	16,07%	15,37%	-18,07%
Depreciation	-3,827	-4,633	-4,351	-4,926	-7,080	-5,968	-4,595	-4,445	-4,315	-4,201	-4,103	-4,019	

6.1.1.5 Tax rate

Table 16 – Effective tax rate (historical and forecasted)
Source: own creation, based on (Carlsberg, 2011-2017)

Tax rate	Historical Value Drivers							Forcast Value Drivers					Average
	2011	2012	2013	2014	2015	2016	2017	2018E	2019E	2020E	2021E	2022E	Historical
Tax rate	25,15%	24,03%	26,08%	27,17%	-48,99%	33,00%	41,39%	27,09%	27,09%	27,09%	27,09%	27,09%	27,09%
Corporate tax	-2,156	-1,529	-2,086	-1,883	-0,849	-2,392	-1,458	-2,556	-2,693	-2,847	-3,018	-3,211	

Table 16 shows the tax rate for the forecasted period that has been estimated as the average of the historical, with the exemption of the effective tax rate in 2015 and 2017. The reason for excluding those

two years is because of the high impairment losses that created abnormal high/low tax rates for those years. The average tax rate of 27,09% is used, which is a realistic assumption based on the previous years.

6.1.2 Pro Forma Balance Sheet

This section will give a justification and explanation on the predicted future growth or changes in accounting items in the pro forma balance sheet of Carlsberg. First, the investment drivers in the non-current assets will be assessed, before the changes in net working capital, and net interest-bearing debt and dividends will be explained.

6.1.2.1 Non-current assets

Table 17 – Non-current assets as a percentage of revenue
Source: own creation, based on (Carlsberg, 2011-2017)

Investment Drivers	Historical Value Drivers							Forecasted Value Drivers					Average
	2011	2012	2013	2014	2015	2016	2017	2018E	2019E	2020E	2021E	2022E	Historical
Intangible assets	122,46%	119,06%	121,22%	109,35%	111,58%	122,55%	109,68%	111,06%	112,43%	113,81%	115,18%	116,56%	116,56%
Property, plant and equipment	48,60%	46,18%	48,84%	44,25%	40,82%	41,22%	39,36%	39,36%	39,36%	39,36%	39,36%	39,36%	44,18%
Investments in associates and JV	7,88%	8,58%	2,82%	5,86%	7,15%	7,51%	6,90%	6,67%	6,67%	6,67%	6,67%	6,67%	6,67%
Other non-current assets	3,96%	4,86%	4,81%	5,26%	5,43%	4,28%	4,23%	4,69%	4,69%	4,69%	4,69%	4,69%	4,69%
Non-current assets	182,90%	178,69%	177,70%	164,72%	164,99%	175,56%	160,17%	161,78%	163,15%	164,53%	165,90%	167,28%	172,10%

Table 17 shows non-current assets as a total of revenue, but also the individual investment drivers that make up the total non-current assets for Carlsberg. Total non-current assets as a percentage of revenue has shown to be significantly volatile in the historical period, fluctuating between a high 182,9% in 2011 to a low 160,17% in 2017. Intangible assets are assumed to gradually increase towards the average of 116,56% in the forecasted period, as a result of the continuing investments in the companies patents and other intellectual property, in order to stay competitive in the mature markets (Ch. 4.3.1.4). Whilst property, plant and equipment is predicted to remain stable at last year's rate of 39,36%, after declining since 2013, as a result of the continued focus on efficiency and cost reduction, and no major new investments (Ch. 4.3.1.2). Investments in associates and joint ventures as mentioned over are expected to remain stable at the average, because of Carlsberg's focus on organic growth. Other non-current assets that consist of receivables and deferred tax assets are also assumed to remain stable at 4,69%. Combined it shows that that total non-current (investment drivers) are predicted to increase in the forecasted period.

6.1.2.2 Net working capital

Table 18 shows that net working capital has had an increasing trend in the historical period, but is assumed to decline in the forecasted period.

Table 18 – Net working capital as a percentage of revenue
Source: own creation, based on (Carlsberg, 2011-2017)

Net working capital	Historical Value Drivers							Forecasted Value Drivers					Average
	2011	2012	2013	2014	2015	2016	2017	2018E	2019E	2020E	2021E	2022E	Historical
Inventories	6,84%	6,76%	7,16%	6,97%	5,84%	6,33%	6,20%	6,19%	6,17%	6,16%	6,14%	6,12%	6,59%
Trade receivables	12,38%	11,71%	11,87%	10,66%	8,77%	8,76%	7,46%	7,46%	7,46%	7,46%	7,46%	7,46%	10,23%
Other current assets	6,68%	5,27%	7,09%	7,53%	6,01%	6,23%	5,41%	6,32%	6,32%	6,32%	6,32%	6,32%	6,32%
Deffered tax liabilities	13,96%	13,29%	12,28%	9,99%	9,06%	9,98%	9,06%	9,37%	9,37%	9,37%	9,37%	9,37%	11,09%
Trade payables	17,37%	17,72%	19,46%	18,66%	18,76%	21,56%	21,80%	21,80%	21,80%	21,80%	21,80%	21,80%	19,33%
Other liabilities	23,52%	21,47%	21,69%	25,70%	27,75%	29,41%	29,30%	28,55%	27,80%	27,05%	26,30%	25,55%	25,55%
Net working capital	-28,94%	-28,73%	-27,32%	-29,18%	-34,95%	-39,62%	-41,09%	-39,75%	-39,02%	-38,28%	-37,55%	-36,81%	-32,83%

The reason for the belief in a decline is mostly the reduction in inventory (packaging materials) in Russia, and that CSC has increased the focus on ordering material supply after demand (JIT), to reduce inventory costs (Ch. 4.3.1.1). The reduction is expected to go gradually down to 6,12% (the average after SAIL '22 was introduced in 2015). In addition, other liabilities are assumed to fall to the historical period average of 25.55%. The other line items are expected to remain stable at the historical periods average (other current assets and deferred tax liabilities), or stable from 2017 (trade payables).

6.1.2.3 Net interest-bearing debt (NIBD) and dividends pay-out

Table 19 – Net interest-bearing debt and dividends
Source: own creation, based on (Carlsberg, 2011-2017)

Net Interest-bearing Debt and Dividends	Historical Value Drivers							Forecasted Value Drivers					Average
	2011	2012	2013	2014	2015	2016	2017	2018E	2019E	2020E	2021E	2022E	Historical
NIBD as a % of invested capital	37,32%	37,56%	39,30%	48,09%	44,42%	36,97%	32,71%	30,57%	28,18%	26,02%	24,11%	22,45%	39,48%
Net-interest-bearing debt	36,524	37,854	39,325	42,048	37,751	31,470	24,078	23,169	21,938	20,900	20,068	19,460	
Cash surplus							-7,392	-0,909	-1,231	-1,038	-0,832	-0,608	
Dividends							-0,702	-3,093	-3,291	-3,515	-3,761	-4,032	

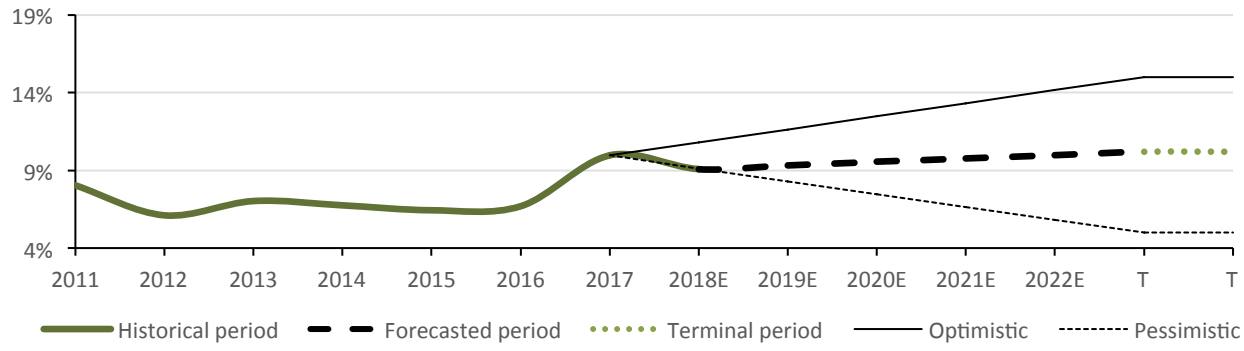
Table 19 shows NIBD in the historical period, as well as NIBD as a percentage of invested capital for comparison purposes. NIDB is determined in the forecasted period, as last year's NIBD minus excess cash surpluses from operations (NOPAT) (Appendix 20-21). Something that follows Carlsberg´s strategy of returning value to shareholders and pay down debt with excess cash (2017a). NIBD (as a percentage of

invested capital) shows a positive declining trend in the forecasted period, meaning that cash surpluses are used to repay debt and reinvest in Carlsberg´s business. Dividends to shareholders are by Carlsberg determined as a percentage pay-out ratio of net earnings in the given year. In 2017, the pay-out ratio was 34% of net earnings, whilst it is set to increase to 50% in the next couple of years, in line with the new strategy SAIL '22 (Carlsberg, 2017a).

6.2 Estimates Supporting the Forecast Assumptions (Optimistic and Pessimistic)

This section will assess the future performance ratios of the pro forma statements, to assess if the forecasted performance of Carlsberg is realistic and achievable based on the historical performance. ROIC will provide a good indication of the quality on the underlying assessments and estimates (Petersen & Plenborg, 2012). Figure 30 shows the historical and forecasted ROIC, as well as an optimistic and pessimistic future ROIC. The historical ROIC has fluctuated between a low 6,1% in 2012, to a high 9,95% in 2017. Whereas the ROIC is expected to fall to a more realistic 9,08% next year, as impairment losses in Russia was excluded from last year's analysis. The ROIC will thereafter slowly increase towards 9,97% again in the next couple of years, before reaching a steady state after 2022E. The assumed ROIC is deemed realistic as it is within the interval for the last couple of years, as well as it has gone back to around the level it was before the challenges that Carlsberg has had in recent years (8,02% in 2011). The implementation of the new strategy, which focuses on reducing costs from operations and increasing invested capital, supports the estimated increase in ROIC (Carlsberg, 2015).

Figure 30 – ROIC historical and forecasted (optimistic and pessimistic scenario)
Source: own creation, based on (Carlsberg, 2011-2017)



A more optimistic assumption of ROIC would be that it would increase towards 15% in the terminal period, which is way above previous performance. In order for this scenario to occur, Carlsberg's revenue will need to increase substantially as well as cost from operations will need to go even further down than

first assumed in the realistic scenario. Carlsberg would have either to launch new products or have great success in entering new markets, something that is not part of their immediate strategy of growing organically in existing markets. In addition, the markets where Carlsberg are currently present are extremely competitive (Ch. 4.2.5), supporting that this scenario is very unlikely to occur in the upcoming years. A more pessimistic scenario would be that the future ROIC moves towards a long time average of 5%, this scenario is deemed more likely. Given the recent political problems that Carlsberg have faced in the Russian market, and the high risk of new governmental rules affecting the beer industry, there is a future uncertainty in political issues that might affect the company and industry (Ch. 4.1.1). In addition, as Carlsberg operates in many international markets, there is always a risk in exchange rates (Ch. 4.1.2.3), shifting social trends (Ch. 4.1.3) and the threat of substitute products like wine and other spirits taking market shares (Ch. 4.2.3).

Table 20 shows the forecasted performance ratios for Carlsberg to further evaluate the predicted future performance. The EBITDA-margin is at 22,35% in the first forecast year, the same as in 2017, but above the historical average of 21,15%. Showing a gradual improvement as operating costs are reduced. Profit-margins, likewise ROIC, goes down in the first forecasted year, before increasing towards a stable 9,97% in year 2022E. Whereas Carlsberg's ATO shows that after an increase in the historical period will decline slowly towards the previous average. The reason for the decreasing ATO is because of the continuing focus in Carlsberg's new strategy to increase the invested capital, whilst sales revenues are not expected to grow at the same rate. ROE and NBC are also expected to show improving numbers. ROE because of the expected higher earnings, whilst NBC is expected to decrease as Carlsberg repays its debt through cash surpluses.

Table 20 – Forecasted performance ratios for Carlsberg
Source: own creation, based on (Carlsberg, 2011-2017)

Ratios	Historical	Forecasted Value Drivers					Average
	2017	2018E	2019E	2020E	2021E	2022E	Historical
ROIC	9,95%	9,08%	9,31%	9,54%	9,76%	9,97%	7,28%
EBITDA margin	22,35%	22,35%	22,74%	23,12%	23,51%	23,89%	21,15%
PM	11,85%	11,08%	11,56%	12,04%	12,53%	13,01%	10,07%
ATO	0,84	0,82	0,81	0,79	0,78	0,77	0,72
ROE	13,86%	11,76%	11,77%	11,83%	11,90%	12,00%	9,81%
NBC	-1,92%	-3,00%	-3,05%	-3,03%	-3,01%	-2,98%	-3,27%

In conclusion, the ratios prove that the assumed future forecasted performance of Carlsberg is realistic, due to the historical trends, market outlook and strategy set out by the company to improve performance.

7. Cost of Capital

When investing in assets or a company, the objective of the investment is to receive a return. For the investor it is logical to invest in the asset that provides the highest return compared to the risk. If an asset performs better than other assets with the same risk, the investor will eventually earn a surplus compared to the expected return of the asset. This creates value for the investor and eventually increases the value of the asset. To invest in an asset is eventually an opportunity costs, since the same investment in another asset could yield a higher return. This cost of capital is also applicable when valuing a company, since the money financing its operations is invested to create future value. As most companies are financed by a mix of debt and equity, which have different cost of capital, WACC is calculated and used by the investor to value the company's return. Because WACC is used as a discounting factor for future cash flow in various valuation models, such as DCF and EVA, which will be used in this paper, even small changes in WACC can show substantial changes in the company's value. For this reason, it is important to calculate the most accurate WACC for the company. WACC is defined as (Petersen & Plenborg, 2012):

$$WACC = \frac{NIBD}{NIBID + E} * R_D * (1 - t) + \frac{E}{NIBD + E} * R_E$$

Where NIBD is the market value of the Net Interest Bearing Debt, E is the market value of Equity, R_D Is the required rate of return on debt, R_E is the required rate of return on Equity, whereas t is the corporate tax rate.

7.1 Capital Structure of Debt and Equity

In order to compute the WACC, a right capital structure has to be estimated. Although the debt and equity can be read from Carlsberg balance sheet, the estimation of a company's value comes from future expectance. This means that the future capital structure has to be estimated. During the analysed period, it is evident that Carlsberg fluctuates with a debt ratio between 52% and 67%, which makes it difficult to conclude a future debt ratio for the company. When looking at Carlsberg's peer group the same level of fluctuation is occurring.

Table 21 – Debt / Equity ratio peer group
Source: own creation, based on (Carlsberg, 2011-2017, AB InBev, 2011-2017, Heineken, 2011-2017, Royal Unibrew, 2011-2017)

E/E+D Ratio	2011	2012	2013	2014	2015	2016	2017	Average
Carlsberg	62,68%	62,44%	60,70%	51,91%	55,58%	63,03%	67,29%	60,52%
AB InBev	51,97%	57,30%	56,99%	54,51%	49,93%	45,44%	42,31%	51,21%
Heineken	52,06%	48,25%	51,13%	53,32%	54,26%	53,48%	50,82%	51,90%
Royal Unibrew	67,69%	80,78%	47,27%	64,48%	71,25%	74,60%	74,27%	68,62%
							Overall average	58,06%
							Damodaran	79,27%
							Adjusted avg.	**62,30%**

As seen in Table 21, the average for each peer is varying significantly from each other. Using an average of the peer's equity ratio of 58,06% as a target capital structure for the WACC could be an option. The down side of the measure is that it only reflects the average trend in the company's history, which might not provide a sufficient measure for the future. Carlsberg states in SAIL '22 that the company is pursuing to pay down debt with cash surplus (Carlsberg, 2017a). This would inevitably create a change in capital structure at least until 2022. By decreasing debt, the equity ratio will increase, and this would be expected to experience a higher ratio than in the historical development. An increase in the debt ratio can furthermore be supported by Damodaran's estimate for equity ratio for the alcoholic beverage industry, which is 79,27% (Damodaran, 2018a). Although this calculation is based on 28 companies, it should only be viewed as an indicator, since it is not possible to validate these companies.

As seen in the forecast in chapter six the cash surplus has been modelled to pay down debt, which resembles the SAIL '22 strategy. This provides the opportunity to calculate the capital structure for each year (Table 22).

Table 22 – Carlsberg's equity ratio
Source: own creation, based on Ch.6 and (Carlsberg, 2017a)

Equity Ratio	2017	2018E	2019E	2020E	2021E	2022E
Total equity begin		49,525	52,618	55,909	59,423	63,184
Profit after tax		6,186	6,581	7,030	7,521	8,063
Dividends (50% payout)		-3,093	-3,291	-3,515	-3,761	-4,032
Total equity end	**49,525**	**52,618**	**55,909**	**59,423**	**63,184**	**67,216**
Net-interest-bearing debt (NIBD)	24,078	23,169	21,938	20,900	20,068	19,460
Invested Capital	73,603	75,787	77,846	80,323	83,252	86,676
Equity ratio	**67,29%**	**69,43%**	**71,82%**	**73,98%**	**75,89%**	**77,55%**

It is evident that the estimated future capital structure from the forecast, compares arguably better to Damodaran's estimate of 79,27%, than the historical average amongst the peer group. Although the forecasted equity ratio could be used to compute a WACC for each forecasted year, the minor impact it would have on the valuation of the Carlsberg would make it insignificant. As seen in chapter eight the net present value of the forecasted cash flows represents between 7,7% - 13,5% (EVA and DCF), of the total value of the company, which arguably makes the change in capital structure during the period insignificant.

From the argument presented, it is estimated that the equity ratio, which best fits the development of Carlsberg, would be the last estimated equity ratio in 2022E, which is 77,55%. The debt ratio is calculated to be (1-77,55%) 22,45%. This can additionally be backed up with the argument that the terminal period has the most significant impact on the valuation. Thus, the estimate of the capital structure in year 2022E would be the one used when estimating the WACC for discounting the terminal period. Since Carlsberg does not reveal the desired capital structure, this estimate is used. Additionally, it can be questioned if decrease in debt at this time would provide a more optimal capital structure, and thereby increase the value of the company. This will be examined in the end of the chapter.

7.2 Expected Rate of return on Equity (R_E)

To estimate the required rate of return the Capital Asset Pricing Model (CAPM) is used (Petersen & Plenborg, 2012). The analysts are aware that the model provides a simplified picture of the world, by applying assumptions. The most significant assumption is that the rate of return is calculated based on historical number. Since a valuation of a company focus on the future, it is not likely that the market, nor the company will remain the same. Although the biases, the CAPM model is found suitable for the purpose of the thesis and the rate of return on equity can be calculated as followed:

$$R_E = R_f + \beta * (R_m - R_f)$$

Where R_f is the risk free interest rate, β is the systematic risk on equity and R_m is the return on the market portfolio. The $(R_m - R_f)$ is the market risk premium MRP (Petersen & Plenborg, 2012). These variables will be estimated in the following sections.

7.2.1 Risk free interest rate (R_f)

To define the risk free rate, a portfolio of assets must be used that yield a return with a 0-beta risk. Since it is difficult to find assets that have no systematic risk, the closest is a long-term government bond. As Carlsberg is based in Denmark and is reporting in Danish Kroner, a running 10 years Danish government bond is found suitable to represent the risk free interest rate. It is evident that the yield on the government bond varies over time, which makes it a challenge to estimate the future development. On December 2017 the yield on the bond was 0,23%, which is significantly low, when looking at a longer historical period. Due to this issue, it has been decided to calculate an average yield on government bonds from the past 20 years. The reason for choosing 20-year period is due to the worldwide economic downturn after the financial crisis in 2008. By including the period before the crisis, provides a picture of the development of the yield on the bond. Furthermore, it is not sufficient to exclude the time of the crisis, since economic downturns are frequent events in the market. The adjusted risk free interest rate has been computed from monthly observations within the 20-year period, and is calculated to be 3,22% (Appendix 22). Compared to the study of Fernandez, Pershin and Acin (2017), the most commonly used risk free interest rate in Denmark is 1,6%, which is significantly lower than the average calculated on historical values**.** Since their report does not state the common use of the risk free interest rates, it cannot be used as an accurate estimate for the case of estimating the value for Carlsberg. It has thereby been decided to use the average of the two, which is 2,41%.

The calculated risk free interest rate is valued to present a more accurate picture of how the rate will develop in the future, and it was decided to use this rate for the forthcoming calculation of the required rate of return on equity.

7.2.2 Tax

The same average effective tax rate (27,09%) has been used for the WACC, as in the estimated forecast and terminal period. It is argued that using the same tax rate, under the same assumptions, in both WACC and forecast would provide the most realistic results, which is likewise stated by Damodaran (Damodaran, 2018b). The effective tax rate has furthermore been used to lever beta, as in accordance to the same argument.

7.2.3 Systematic risk (β)

To determine the expected rate of return on equity, the company's systematic risk/volatility has to be estimated in comparison to the market. Systematic risk is unpredictable risk that can influence the whole market, such as economic downturns, natural disasters and government policies. When investing in an asset, the level of systematic risk rewards a comparable premium as presented in the CAPM model. The β represents an investment in systematic risk in correlation with the market risk, where the market represents the portfolio of alternative investments to Carlsberg (Petersen & Plenborg, 2012). In this section β will be estimated by using two methods to minimise bias. The first method is to estimate the company specific β by measuring the correlation between the market portfolio and the asset. The second method is called the bottom up approach, where the β is estimated from the company's peers (Damodaran, 2018c).

The ideal market portfolio consists of individual securities, which could provide the opportunity to trade in addition to the Carlsberg stock (Brealey, et al., 2014). As presented in section 2.1.4.1, the Carlsberg investor is mostly located in the US and Europe and the market portfolio should represent a possible market, where the investor would trade. Since trading stock is not bound to a specific location, it is argued that the world market is the Carlsberg investors' market place, and should represent the market portfolio. Thus it has been decided to estimate beta from three indexes that represents the global market; MSCI US, MSCI EU and MSCI Asia, which are also mentioned by Koller, Goedhart and Wessels (2010) to be good representation for the market portfolio. By using large market, index such as MSCI it prevents the bias of Carlsberg co-varying with the index. This would have affected the β estimate if a minor index, such as OMXC20, were chosen, as Carlsberg has a substantial weight in the index. Furthermore, the listed Carlsberg stock is divided into A and B stock, which means that the appropriate β would be a weighted average between the two stocks. The distribution between the two stocks is; Carlsberg A represents 22% of the total amount of issued shares and Carlsberg B represents 78% (Carlsberg, 2017a).

To estimate β a sampling period has to be determined. In this paper to periods will be used, which will be a 5-year period with weekly samples, and a 10-year period with monthly samples. Koller, Goedhart and Wessels (2010) state, that a period must contain more than 60 data points to be sufficient for regression, which is evident for both periods. This provides the opportunity to understand if different periods will have different influence on the estimation of β.

The company specific beta is computed from the three MSCI indexes, correlated to both the Carlsberg A and B stock and can be calculated accordingly:

$$\beta_i = \frac{Cov(x_i, x_m)}{\sigma_m^2}$$

Where x_i is the return on the company stock, x_m is the return on the market portfolio and σ_m^2 is the variance on the market portfolio (Levy & Sarnat, 1994). From the estimation of the company specific beta, it is apparent that the time period has an influence on the result as seen in Table 23.

Table 23 – Carlsberg's BETA
Source: own creation, based on (Bloomberg, 2018)

Company specific beta (10 years)				Company specific beta (5 years)			
Index	Carlsberg A	Carlsberg B	Weighted avg.	Index	Carlsberg A	Carlsberg B	Weighted avg.
MXWO	0,973634174	1,143303829	1,105976505	MXWO	0,532555315	0,766742856	0,715221597
MXEU	1,086278191	1,270452846	1,229934422	MXEU	0,369330244	0,614921091	0,560891105
MXAP	0,845752614	0,989709417	0,958038921	MXAP	0,415279382	0,511520977	0,490347826

The six estimated betas vary from 0,49 – 1,22, which is seen as a major variance in the result. This would give an overall average of the beta of 0,8434. Due to the significant variance in the computed betas a rolling beta over time has been computed to investigate the fluctuation in the estimates. When studying the rolling betas for the various regressions, with the different markets seen in (Appendix 23-24), it is apparent that none of the regressions provide a steady beta over time. This concludes that the estimation of the betas might be biased and be problematic to use solely as the beta for the calculation of the require rate of return on equity.

The bottom up approach computes the beta from the peer group of the company. This will decrease the standard error compared to a single regression for the company specific beta. However, since the companies within the peer group are not exactly similar to Carlsberg, it could furthermore increase error in the estimate. When computing the various betas for the companies in the peer group, the leverage within the specific companies has an effect on the computed beta. Due to this, the raw estimated betas have to be unleveraged and furthermore be leveraged according to the debt of Carlsberg. The relationship of the leveraged and unleveraged beta can be expressed as (Damodaran, 2018c):

$$\beta_L = \beta_U * \left(1 + \frac{D}{E} * (1 - t)\right)$$

Where β_L is the leveraged beta, β_U is the unleveraged beta, $\frac{D}{E}$ is the debt equity ration and t is the tax rate.

Table 24 – BETA peer group
Source: own creation, based on (Bloomberg, 2018)

Adjusted bottom up beta (5 years)					Adjusted bottom up beta (10 years)				
Index	Heineken	AB Inbev	Royal unibrew	Avg.	Index	Heineken	AB Inbev	Royal unibrew	Avg.
MXWO	0,81494	0,94437	0,89461	0,88464	MXWO	0,65756	0,33926	1,04888	0,68190
MXEU	0,64143	0,85124	0,78113	0,75794	MXEU	0,80880	0,46496	1,40874	0,89417
MXAP	0,58590	0,43227	0,37005	0,46274	MXAP	0,56861	0,26046	0,62862	0,48590
			Total avg.	0,70177				Total avg.	0,687323

From the estimation of the Carlsberg's bottom up beta in Table 24, it is evident that the different periods have less influence than in the estimation of the company specific beta.

The various results of the different index still show a variance, where the adjusted average of the peer group betas vary from 0,26 – 1,4 Although this variance, the two computed betas are approximately similar with a total average of 0,6946. Again, the rolling beta over the periods have been computed, to understand if there is a fluctuation in the development in the beta, which can be found in (Appendix 25-27). The result is similar to the company specific beta, and shows a highly fluctuation trend in the development of the betas for all the peers in the indexes, which again shows inconsistency and might create a bias.

Koller, Goedhart and Wessels (2010) argue that the none-steady development of a rolling beta could be caused by the change in capital structure over time, which would have a significant influence. This could be true in this case, since it is apparent that the capital structure changes during the period of Carlsberg, and all its peers. Because of this, an average has been used, when computing the betas. Furthermore, it was decided to smoothen the beta results from both calculations. According to Koller, Goedhart and Wessels (2010) computed beta results with significant outliers are not uncommon, and therefore be smoothened with Bloomberg's smoothening mechanics, based on Marshall Blume's observation, that the betas revert forwards the mean over time (Blume, 1975). The following formula can thereby be used to smoothen the beta (Koller, et al., 2010):

$$\beta_{adj} = 0{,}33 + 0{,}67 * \beta_{raw}$$

When smoothening the company specific beta it results in an adjusted beta of 0,9483, whereas the bottom up beta, estimated from the peer group, is adjusted to 0,8992.

As seen in the estimation of beta, it is an imprecise process that leads to a significant variation. To only use, a company specific beta would arguably not be sufficient, due to the high risk of bias. At the same

time using a peer-based beta with a peer group of three companies has in the same way a high risk of bias, and would be inadequate. Koller, Goedhart and Wessels (2010) argues that the use of an industry beta would yield a less biased result. Comparing the industry beta computed by Damodaran (Damodaran, 2018c), which is estimated from 52 companies within the industry, would arguably provide a less biased result that the estimation of a company specific beta or a peer-based beta estimated from three companies. The industry beta adjusted for Carlsberg's leverage would be 0,7714, which ideally is not far from the computed betas. Due to the argument Koller, Goedhart and Wessels (2010) presents that the industry beta would provide a better result in most instances, it has been decided to use the industry beta of 0,7714 to furthermore calculate the required rate of return on equity. The industry beta should not been understood as a perfect beta, since there is a high chance that the 52 companies included in the calculations are significantly different from Carlsberg. Besides this, it is still argued that due to the relatively larger sample size compared to a peer group of three, the industry beta would yield a better estimate.

7.2.3 Market risk premium

The MRP is the difference between the expected return on a market portfolio and the risk free rate. The MRP is estimated based on historical returns. Koller (2010) argues to use a MRP within the appropriate range of 4,5% - 5,5%, whereas Petersen and Plenborg (2012) are less specific and presents MRPs that varies from 5,3%-7,9% in different areas in the world. Since both books are published more than six years ago, the MRP could have changed. According to the rapport published by Fernandez, Pershin and Acin (2017), the use of MRP in different parts of the world is still within the same range, but the report shows a different distribution amongst the countries. Since the ownership distribution of the Carlsberg public equity is reveal in the annual report for 2017, a weighted average of MRPs have been calculated to match the location of the investors, which is apparent in (Appendix 28). Thus the estimated MRP for Carlsberg is ($MRP = K_m - R_f$) *8,81% - 2,41%* = 6,40%.

7.5.1 Calculation of required rate of return on equity

From the estimation of the components in the CAPM model, the required rate of return on equity can be calculated accordingly:

$$2{,}41\% + 0{,}7714 * 6{,}40\% = \ 7{,}35\%$$

7.3 Cost of Debt (R_D)

According to Petersen and Plenborg (2012), the cost of debt can be calculated as followed:

$$R_D = (R_f + R_s) * (1 - t)$$

Where R_f is the risk free interest rate, R_s is the credit spread i. e. risk premium on debt and t is the corporate tax rate.

To estimate the credit spread for Carlsberg, Moody's scale and Fitch rating is used. Carlsberg has since 2006 been rated by Moody and Fitch as Baa2 (Moody) and BBB (Fitch) (Carlsberg, 2017a). These ratings yield a credit spread of 1,27% (Moody & Fitch) (Damodaran, 2018d). From the information, the cost of debt can be calculated:

$$(2{,}41\% + 1{,}27\%) * (1 - 27{,}09\%) = 2{,}68\%$$

7.4 WACC Calculation

Based on the estimation of the components, the WACC can be calculated as followed:

$$WACC = 22{,}45\% * 2{,}68\% * (1 - 27{,}09\%) + 77{,}55\% * 7{,}35\% = 6{,}1345\%$$

7.4.1 Sensitivity of beta and Rf

From the estimation of WACC, it was evident that some of the parameters has a high risk of providing an inaccurate estimate, such as beta and risk free rate. Since the capital structure weights the return on equity higher than debt, these factors might have a significant influence on the WACC. This has been tested in the following sensitivity analysis.

Figure 31 – Sensitivity analysis: beta vs. Rf
Source: own creation

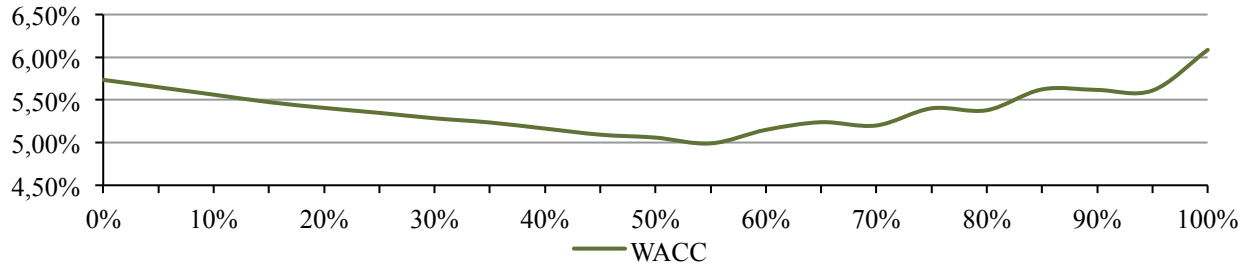
	Beta	Optimistic		Realistic		Pessimistic
Rf		0,4715	0,6215	0,7715	0,9215	1,0715
Optimistic	0,41%	3,59%	4,56%	5,54%	6,52%	7,49%
	1,41%	4,12%	4,98%	5,84%	6,70%	7,56%
Realistic	2,41%	4,65%	5,39%	6,13%	6,88%	7,62%
	3,41%	5,18%	5,80%	6,43%	7,06%	7,69%
Pessimistic	4,41%	5,71%	6,22%	6,73%	7,24%	7,75%

As seen in Figure 31, realistic calculated spreads of both beta and Rf, which resembles the variation found in the estimation of the parameters. It is clear from the model that changes in both parameters have a significant impact on WACC, where it can vary from 3,59% - 7,75%. Since WACC is sensitive to the change in the two parameters, which were estimated with a high chance of bias, it shows a high risk in the estimation of WACC. The decision to use the industry beta rather than the average of the computed betas is seen as the right decision, as the computed beta would change the WACC to be closer to 7%. The marginal change in beta would result in a change of 0,58%. The use of a sole average of the Rf for the past 20 years would also have influenced WACC, but not as significantly as the beta. Here the marginal change in Rf result in a change of 0,12%.

7.5 Optimal Capital Structure

Although Carlsberg (2017a) has states in the annual rapport that the company intended to pay down debt from cash surplus, which would decrease the debt ratio, it is worth investigating what the optimal capital structure would be for Carlsberg. According to Damodaran (2018e), the optimal capital structure would yield the lowest cost of capital i.e. WACC. To study this, portfolios of different debt and equity mix have been computed based on the parameters estimated previously (Appendix 29). Parameters that are directly affected by change in capital structure, such as beta and credit spread, have been regulated according to. Although, the interest rate would change following an increase in debt, it remains constant in the calculations at a level of the average interest rate for the forecast period of 5,56%. The reason as was not possible to find sufficient information about Carlsberg's interest rate in comparisons to the different level of credit risk**.**

Figure 32 – Optimal capital structure (WACC vs. debt ratio)
Source: own creation based on (Damodaran, 2018e)



As seen in Figure 32 the lowest point of WACC is at a debt ratio of 55%, which means that the optimal capital structure would be 55% debt and 45% equity, according to the calculations. Seen in the light of the

statement from Carlsberg, related to the strategy of further decreasing debt past the debt ratio of 32,7%, is contradicting the calculated optimal capital structure (Carlsberg, 2017a).

There can be various reasons for the difference. First, the model can be insufficient due to the fixed interest rate. Since the interest rate does not vary with the increase in credit risk, as the risk of bankruptcy will increase, the cost of debt in the model will be generally lower. Overall changing the interest rate to 10% would yield in Carlsberg's current capital structure of approx. 30% debt. Such an assumption of an overall interest rate of 10%, seems unrealistic, and thus it can be argued that the calculated debt ratio should be slightly lower than 55%.

Another reason for Carlsberg to decrease debt could be that Carlsberg has an expectation that cost of debt will rise in the future. As seen in appendix 22, the risk free rate is at an all-time low compared to the past 20 years, which would have an influence on Carlsberg's interest rate. There will be a chance that the interest rate would go up in the future, and Carlsberg might expect that, which would increase the cost of debt. Since Carlsberg does not address this matter in any of the company's annual rapports, this can only be seen as a presumption. Furthermore, Carlsberg is rate by Moody and Fitch to be Baa2 and BBB (Carlsberg, 2017a)**.** This rating is located in the middle section of the scale, and yields a higher credit spread than a class A rating. To reduce debt, the risk of insolvency would be lower, which would result in a better rating, and eventually a lower interest rate on debt. Strevulaev and Yang (2013), investigated companies with non-optimal capital structures, and states that a reason to deviate from an optimal capital structure could be due to the effect of shareholder on the firm's decision-making**.** This could also be the case for Carlsberg's capital structure in this instance.

8. Valuation

This chapter will estimate the realistic intrinsic value of Carlsberg, based on the forecasted assumptions in the pro forma statements in chapter six. As previously mentioned, the forecast is assumed to reach a steady state in 2022E (when the realistic strategy is set to be fully implemented), thus is only one terminal period has been chosen. The chosen valuation methods will be explained, as the selected methods will also be used in the different scenario analysis in chapter ten. The enterprise value and market value of equity will be estimated through two different present value approaches; the discounted cash flow model (DCF) and the economic value added model (EVA). Two different models are used in order to ensure that all calculations are done correctly, as both methods should present the same results. There are many different models, but the present value approaches offer the most accurate share price, as it measures a company's ability to produce a positive cash flow. The DCF model is a favourite among practitioners because it relies solely on the flow of cash in and out of the company (Koller, et al., 2010). In addition, a DCF valuation is the most accurate and flexible method for valuating projects, divisions and companies (Koller, et al., 2010). Whilst, the EVA method is an excess return approach that relies on the accrual accounting data. Despite this difference, the two models are theoretically equivalent valuation methods (Petersen & Plenborg, 2012).

The chapter will then assess a relative valuation approach (multiples), comparing multiples with the selected peer group. The relative valuation is done to test the credibility of the cash flow forecast, explain differences between Carlsberg's performance and that of its peers, as well as to assess which companies the market believe are best positioned to create the most value (Koller, et al., 2010).

A sensitivity analysis is also conducted to help justify the assumed terminal period growth rate, showing which effect a change in either the growth rate or the estimated WACC (Ch. 7) might have on the share price. The chapter will be concluded, by assessing the findings from the realistic stand-alone valuation.

8.1 DCF Valuation

According to the DCF model, the value of a company is determined by the present value of future cash flows, where the free cash flow to firm (FCFF) and WACC affect the value. A higher FCFF or a lower WACC would increase Carlsberg's enterprise value (EV), market value of equity, and share price (Petersen & Plenborg, 2012). Carlsberg's future cash flows have been estimated based on the assumptions

presented in chapter six (Appendix 18-21), and the WACC used in the valuation is estimated and justified in chapter seven.

To find Carlsberg's estimated enterprise value, the DCF valuation has been calculated using the two-stage formula specified below (Petersen & Plenborg, 2012):

$$EV_0 = \sum_{t=1}^{n} \frac{FCFF_t}{(1+WACC)^t} + \frac{FCFF_{n_{+t}}}{WACC - g} x \frac{1}{(1+WACC)^n}$$

Where the combined value of the FCFF in the forecasted horizon (2018E-2022E), and the terminal value of FCFF will result in the EV of the company. Whereas, each FCFF in the forecast horizon and the terminal period are discounted to present values of future cash flows, in order to reflect the risk faced by all investors and the time value of money. WACC is selected as the ideal discount factor, as it reflects the required rate of return for both debt and equity holders (Koller, et al., 2010). In addition, as previously mentioned in chapter 7.4 the WACC is assumed stable in both the forecast horizon and terminal period.

Furthermore, the estimated share price of the company is calculated by dividing the estimated market value of equity (EV + NIBD), by the number of outstanding shares at the cut of date (152,856 million shares) (Carlsberg, 2017a). Figure 33 shows the estimated EV and share price of Carlsberg based on the realistic forecast assumptions in chapter six.

Figure 33 – Carlsberg: Discounted Cash Flow (DCF)
Source: own creation, based on (Carlsberg, 2011-2017)

Dividends Cash Flow Model (DCF)	2018E	2019E	2020E	2021E	2022E	Terminal
Free cash flow to firm (FCFF)	4,697	5,191	5,186	5,196	5,219	6,691
WACC	6,135 %	6,135 %	6,135 %	6,135 %	6,135 %	6,135 %
Discount factor	0,9422	0,8877	0,8364	0,7881	0,7425	
Present value of FCFF	4,425	4,608	4,338	4,095	3,876	
Value of FCFF in forecast horizon	21,342					
Value of FCFF in terminal period	136,738					
Estimated enterprise value	158,081					
NIBD	-24,078					
Estimated market value of equity	**134,003**					
Shares outstanding 7/2/2018 (billion)	0,152856					
Estimated Share price DKK	**876,66**					
Share price on 7/2/2018 DKK	715					
Difference (upside potential)	22,61%					

Carlsberg's EV is estimated to be 158,081bn DKK as of February 7th 2018, resulting in an estimated share price of 876,66DKK per share. An estimated share price of 876,66DKK shows that Carlsberg shares have a potential upside of 22,61%, based on the forecasted assumptions. Where the terminal period accounts for 86% of Carlsberg's EV, indicating that most value is created in the long-term.

8.2 EVA Valuation

The EVA model determines the value of a company by the initial invested capital (2017) plus the present value of all future EVA's, where the future EVA's and WACC affect the value. Higher EVA's or a lower WACC would increase Carlsberg's EV, market value of equity, and share price. In addition, a positive value (EVA) is achieved when ROIC exceeds WACC. In order to estimate Carlsberg's EV, the EVA valuation has been calculated using the two-stage formula specified below (Petersen & Plenborg, 2012):

$$EV_0 = Invested\ Capital_0 + \sum_{t=1}^{n} \frac{EVA_t}{(1+WACC)^t} + \frac{EVA_{n_{+t}}}{WACC - g} x\ \frac{1}{(1+WACC)^n}$$

$$\text{Where, } EVA = NOPAT_t - (WACC\ x\ Invested\ Capital_{t-1})$$

WACC is selected as the ideal discount factor in the EVA model for the same reasons as in the DCF. Whereas, the estimated market value of equity, and the estimated share price, is calculated in the same manner as in the DCF model. Figure 34 shows Carlsberg's EV and estimated share price using the EVA model, based on the forecasted assumptions in chapter six.

The EVA model yields the same results as the DCF model, supporting the fact of being theoretically equivalent. All the generated EVA's are positive throughout, meaning that ROIC exceeds WACC in all forecasted periods, and that Carlsberg trades above its book value of invested capital (Petersen & Plenborg, 2012). In contrast to the DCF model, where the terminal period accounted for 86,5% of the EV, the terminal period in the EVA model accounts for 45,8% of the EV. Whereas, excess returns (forecast and terminal period) are added to the 46,6% of the EV that derive from invested capital.

Figure 34 – Carlsberg: Economic Value Added (EVA)
Source: own creation, based on (Carlsberg, 2011-2017)

Economic Value Added Model (EVA)	2018E	2019E	2020E	2021E	2022E	Terminal
NOPAT	6,881	7,250	7,663	8,125	8,643	8,859
Invested capital beginning of period	73,603	75,787	77,846	80,323	83,252	86,676
WACC	6,135 %	6,135 %	6,135 %	6,135 %	6,135 %	6,135 %
Cost of Capital	4,515	4,649	4,775	4,927	5,107	5,317
EVA	2,37	2,60	2,89	3,20	3,54	3,54
Discount factor	0,9422	0,8877	0,8364	0,7881	0,7425	
Present value of EVA	2,229	2,309	2,415	2,520	2,625	
Invested capital beginning of period	73,603					
Present value of EVA in forecast	12,099					
Present value of EVA in terminal	72,379					
Estimated enterprise value	158,081					
NIBD	-24,078					
Estimated market value of equity	**134,003**					
Shares outstanding 7/2/2018 (billion)	0,152856					
Estimated share price	**876,66**					
Share price 7/2	715					
Difference (upside potential)	22,61%					

8.3 Relative Valuation (Multiples)

As previously mentioned, the relative valuation (multiples) approach compares a few selected multiples with that of the selected peer group. This is done to test the credibility of the forecast assumptions and to identify differences between Carlsberg and its peers, where the method might also serve as a sanity check of the present value model results. Petersen and Plenborg (2012) states that the relative valuation approach is popular among practitioners due to the low complexity and speed of which it can be performed, but a more thorough multiples valuation is both time consuming and complicated. Despite some shortcomings, multiples have appealing features as they rely on market prices that contain value relevant information. The next part of this section will see to explain the choice of multiples used, and the estimated relative valuation results.

8.3.1 Choice of multiples

There are many different types of multiples to choose from, when conducting a relative valuation, but not all methods are, appropriate in this valuation. The most important thing to consider before conducting a relative valuation is the selection of a comparable peer group (Ch. 2.4), for this relative valuation, the three previously selected companies are chosen for the mentioned reasons. The different types of multiples can be categorised into two different groups, either being based on EV or the value of equity.

The multiples that are based on the value of equity, as the P/E multiple, is not only affected by the individual companies operating performance, but also the capital structure, in finding the relative value (Koller, et al., 2010). Since the capital structures in the selected peer group varies, this measure is excluded from the valuation as it might lead to a less reliable indication of companies relative value, compared to a multiple that is based on EV. The primary multiples that this relative valuation will focus on are the EV/EBITDA and EV/EBIT multiples. The EV/EBITDA multiple is the most popular relative valuation multiple as it tells more about the companies value, generated from core operation, than any other multiple, as the EBITDA margin is most likely to be similar among its peers. In addition to the similar tax rate that is required for the EV/EBIT multiple, the EV/EBITDA requires similar depreciation rates, as differences in the internalisation of core activities will affect the rates and make a comparison difficult (Koller, et al., 2010) (Ch. 2.4). Furthermore, the EV/NOPAT multiple will be included in the valuation for comparison purposes.

8.3.2 Multiples calculations

Table 25 – Relative valuation (multiples)
Source: own creation, based on (Carlsberg, 2017a; Bloomberg, 2018)

Multiple Valuation	EV/EBITDA 2017	EV/EBIT 2017	EV/NOPAT 2017
AB InBev	15,03	18,67	21,57
Heineken	12,72	18,61	25,17
Royal Unibrew	14,69	18,72	23,91
Mean	14,15	18,67	23,55
Harmonic Mean	14,07	18,67	23,45
Estimated Share price	**1114,07**	**968,48**	**966,59**
Share price 7/2/2018	715	715	715
Difference (upside potential)	55,81%	35,45%	35,19%
High	1200,57	971,84	1049,11
Low	992,11	965,01	876,20

Table 25 shows the relative valuation calculations of the peer groups EV multiples. Where the EV for the companies was sourced from the Bloomberg terminal, in order to obtain the most accurate EV for the valuation (Bloomberg, 2018). In addition, the calculations are done based on the current (2017) margins of the companies, as long term expected margins are not available. Even though (Koller, et al., 2010) states that future expected margins is preferred to better represent the long-term value, the industry and companies margins growth have been stable throughout the analyst period (Ch. 2.3), indicating that large deviations are unlikely. Furthermore, the harmonic mean is used, when determining the estimated share

price of Carlsberg, based on the relative valuation, as it generates a more accurate value estimation (Baker & Ruback, 1999).

The relative valuation shows that Carlsberg's share price is estimated to have a potential upside from the share value at the cut of date, of between 35,2% to 55,8%. A share price that is between 10,25% and 27,08% higher compared to the estimated 876,66 DKK in the DCF and EVA valuation. Indicating that Carlsberg is traded at a discount compared to AB InBev, Heineken and Royal Unibrew. Backed up by the EV/EBITDA and EV/EBIT harmonic mean, that is 22% and 11,9% below that of its peers. Both the present value valuation and relative valuation indicates that Carlsberg is undervalued compared to its peers. The lower values can either be because the forecasted cash flow prediction are too pessimistic or that the company has worse predictions compared to that of its peers, and therefore trading at lower multiples. Another explanation could be that Carlsberg has a higher risk, as the political factors in Russia (Ch. 4.1.1.2), compared to the peer group. Indicating that Carlsberg shares should be traded at a discount.

8.4 Sensitivity Analysis

The forecast (Ch.6) provided assumptions based on the financial (Ch. 3) and strategic (Ch.4) analysis that formed the basis of the valuation. The assumptions made might be biased and related with uncertainty. Therefore, a sensitivity analysis of key value drivers in the DCF valuation is necessary (Petersen & Plenborg, 2012). As in the DCF valuation, the terminal period accounts for 86,5% of the total EV, indicating that the valuation might be sensitive to changes in the terminal growth rate. We believe that the growth rate based on the predicted GDP growth in Carlsberg's key markets is justified, but acknowledge that a sensitivity analysis of how sensitive the share price would be to changes in the WACC and terminal growth period is beneficial. In addition, a sensitivity analysis is conducted of how changes in Carlsberg's core operations (EBITDA margin) would affect the share price.

8.4.1 Terminal Growth vs. WACC

Figure 35 shows Carlsberg's estimated share price in the valuation with regards to potential changes in the terminal growth and WACC. It can be seen that in the most optimistic scenario that the share price of Carlsberg would be 1372,30 DKK, a potential upside of 91,9% (share price 7/2). Whilst the most pessimistic scenario would result in a share price of 670,61DKK, a potential down side of -6.2%.

Figure 35 – Sensitivity analysis: terminal growth vs. WACC
Source: own creation, based on (Ch.6, Carlsberg, 2017)

	Growth	Pessimistic			Realistic		Optimistic	
WACC		1,75%	2,00%	2,25%	2,50%	2,75%	3,00%	3,25%
Optimistic	5,385%	954,77	998,77	1049,63	1109,32	1180,34	1266,25	1372,30
	5,635%	892,17	928,82	970,76	1019,39	1076,46	1144,36	1226,50
	5,885%	837,14	867,88	902,74	942,75	989,15	1043,60	1108,37
Realistic	6,135%	788,38	814,31	843,48	876,66	914,75	958,91	1010,73
	6,385%	744,89	766,85	791,38	819,08	850,58	886,74	928,67
	6,635%	705,85	724,51	745,23	768,46	794,67	824,50	858,73
Pessimistic	6,885%	670,61	686,50	704,06	723,61	745,53	770,27	798,42

In addition, a stable WACC of the estimated 6,135%, where an upwards growth from 2,5% (876,66DKK) to 3,25% (1010,73DKK) would result in an increase in share price of 13,3%. Whilst if growth declined from 2,5% to 1,75% (788,38 DKK), would result in a decline in the share price of -10,07%. This shows that Carlsberg shares are more sensitive to an upward change in growth, compared to if growth declined. Simultaneously, if the growth rate was stable at 2,5%, and the WACC increased from 6,135% to 6,885% (723,61DKK), would result in a decrease in the share price of -17,5%. Whilst a decline from 6,135% to 5,385% (1109,32DKK), would result in an increase in the share price of 26,5%. This shows that Carlsberg shares are more sensitive to a decrease in WACC, and to changes in WACC compared to if the terminal growth changes at the same interval.

8.4.2 Terminal Growth vs. EBITDA margin

Figure 36 shows Carlsberg's estimated share price in the valuation with regards to potential changes in the terminal growth rate and EBITDA margin.

Figure 36 – Sensitivity analysis: terminal growth vs. EBITDA margin (terminal)
Source: own creation, based on (Ch.6, Carlsberg, 2017)

	Growth	Pessimistic			Realistic		Optimistic	
EBITDA		1,75%	2,00%	2,25%	2,50%	2,75%	3,00%	3,25%
Pessimistic	23,14%	747,50	770,76	797,01	826,88	861,15	900,90	947,54
	23,39%	761,15	785,27	812,50	843,47	879,02	920,24	968,60
	23,64%	774,81	799,79	827,99	860,07	896,88	939,57	989,67
Realistic	23,89%	788,46	814,31	843,48	876,66	914,75	958,91	1010,73
	24,14%	802,12	828,82	858,97	893,26	932,61	978,25	1031,80
Optimistic	24,39%	815,77	843,34	874,45	909,85	950,48	997,58	1052,86
	24,64%	829,43	857,86	889,94	926,44	968,34	1016,92	1073,92

The most optimistic scenario analysed of a higher growth in the terminal period and a lower EBITDA margin, would result in a potential upside of 50,2% (1073,92DKK), compared to the actual share price (715DKK). Whilst the most pessimistic would result in a slight upside of 4,5% (747,50DKK).

Furthermore, Carlsberg's share price is more sensitive to a decreasing EBITDA margin, where a 0,75% decrease (realistic terminal growth), would result in a share price of 826,88 DKK (-5,7% change). Whilst a similar increase would result in a share price of 926,44DKK (5,7 % change). This further reveals that Carlsberg is more sensitive to changes in the terminal growth rate than if the EBITDA margin changed at the same interval.

8.5 Findings from the Estimated Realistic Valuation

Based on the forecast assumptions made in chapter six, Carlsberg is estimated to have an EV of 158,081bn DKK, resulting in an estimated share price of 876,66DKK. A share price that would yield a potential upside of 22,61%. The DCF valuation estimates are the same in the EVA valuation, supporting the fact of being theoretically equivalent.

Furthermore, the relative valuation compared to the selected peer group, shows that Carlsberg's shares are currently being traded at a discount. Either as a result of the analysts being too pessimistic in the assumptions, or that Carlsberg is subjected to higher risk and therefore should be traded at a discount.

The sensitivity analysis shows that Carlsberg's share price is very sensitive to small changes in key factors such as the terminal growth, WACC and EBITDA margin. Where changes in WACC would yield the larges differences in the estimated share price, and a change in the EBITDA margin would result in the least. In addition, the share price is more sensitive to an increase in the terminal growth rate, than a decline. All three factors reveal that changes would have substantial effects on Carlsberg's estimated share price, especially as most of the EV (86,5%) in the DCF is created in the terminal period.

9. TOWS

Throughout the analysis of Carlsberg, value drivers have been identified, and the company's strategy has been analysed, which created the based for the forecast and valuation. The valuation of the company was thereby based on Carlsberg own strategy and future expectations, which is heavily influenced by SAIL '22. On the other hand, Carlsberg could choose other strategic options, which could influence the valuation differently. In this part of the thesis, these strategic options (tactics and actions), will be identified from a TOWS analysis, and the results will be used in the following chapter.

The TOWS analysis is based on the same theory as SWOT, when it comes to analysing a company's internal strengths and weaknesses and external threats and opportunities. Whereas SWOT can identify the company's position in theses areas, TOWS can be used to identify strategic options that can mitigate downsides and benefit from the upsides. This approach focus on four different environments; (1) how to use the internal strength to take advantage of external opportunities. (2) How internal strength can mitigate or eliminate external threats. (3) How external opportunities can help overcoming internal weaknesses. (4) How to minimise internal weaknesses and overcome threats (Weihrich, 1982). By creating strategies that combine the SWOT factors, the analysis can be used as a planning tool, which reveals options that can unlock synergies in between. The TOWS analysis is based on the findings summarised in the SWOT analysis earlier in the thesis.

9.1 Strengths and Opportunities (++)

The tactic and action for this environment is to create a position for the company to utilise its strengths to maximise the opportunities. From the TOWS analysis, four strategic options have been identified.

Developing new products to expand product portfolio that fits consumer preferences (S2,O1) is a strategic option arising from Carlsberg strength in R&D, and the opportunity to grow the company's portfolio, due to new consumer preferences. Carlsberg would be able to create a competitive advantage by developing new products that can take market shares from substituting products and industry competitors.

Strong Danish brand heritage with a reputation for high quality can be used as a brand strategy to grow in all markets (S3,O2). As defined previously, Carlsberg brand identity is a sustainable competitive advantage, which the company can use to grow in new markets or take market share in mature markets.

Agile company structure can help improving core operations, by restructuring (S4,O4), which will be value creating for Carlsberg, since the company is not performing to the level of its peers. This creates the opportunity for the company to restructure to obtain better profitability.

High level of control over value chain and innovation can be used to decrease costs of sourcing, production, sales and logistics (S5S2,O5). The prior investment into the supply chain, such as suppliers of barley, provides the opportunity to optimise procurement. Furthermore, innovation within the company's production, reporting and logistics, due to new systems can unlock synergies between the facilities and brands in Carlsberg's portfolio.

9.2 Strengths and Threats (+-)

In this environment three tactics and actions have been identified that can create a position for Carlsberg, to utilise its strengths to mitigate threats.

Innovation in products and the agile company structure can mitigate the threat from the switch in consumer preferences by taking a first mover advantage. In addition**, the Danish brand of quality can influence the consumer's preferences (S2S3S4,T1)**. Carlsberg's level of innovation in products make the company more likely to create a first mover advantage, in developing new product that can influence the consumer's preferences to Carlsberg's advantage. Combined with the company's SCA from its Danish brand heritage, this could also influence the consumers to prefer high quality, and the story telling of Danish traditions.

An agile company structure can mitigate the influence of new laws and taxes. Carlsberg is able to change strategy to avoid long-term impact of eventual changes in laws and tax policies (S4,T2). As seen before, Carlsberg is able to adapt to situations, such as the decrease in the Eastern European market, due to increase in taxes in Russia. Since there is always a probability that the markets will change, it is an advantage for Carlsberg to stay agile to overcome future expectancies.

Internal rivalry, substitutes and new entrants can be diminished by first mover advantage, with an innovative and technologic lead. Using a well-known brand can also ease the threat. If Carlsberg needs to restructure to mitigate the threat, the company can do so, due to the agile company structure (S2S3S4,T3T4T5). As an extension of the prior strategies, Carlsberg could furthermore combine its competitive advantages, such as its high level of innovation, brand and agile company structure, to moderate the effect of competition by becoming a market leader in some areas. As stated in

Carlsberg's annual rapport for 2017 (Carlsberg, 2017a), the company is investing in its non-alcoholic and speciality beer segment, which increase the company's competitiveness according to the market trends studied. The well-known Carlsberg brand would likely increase the chance of new products becoming recognisable and desired by consumers (Carlsberg, 2017a).

9.3 Weaknesses and Opportunities (-+)

In this environment, four tactics and actions have been identified to circumvent Carlsberg's internal weaknesses by capitalising from external opportunities.

With focus on optimising the core operations and supply chain, Carlsberg could become more competitive amongst its peers (W1W2,O4O5). As in prior strategies, Carlsberg would benefit from optimising the company's operations and supply chain to the level of its peers.

Grow in the markets with growth potential such as Asia (W4,O2). Although many markets Carlsberg is present in are mature, there are still markets with significant growth potential, such as markets in Asia, where Carlsberg already is present. To further pursue these markets would mitigate the weight of the mature markets.

Investment in innovation and knowledge sharing provides opportunity for developing new products that matches new consumer preferences (W5,O3). This results in similar strategy as earlier presented.

Carlsberg can increase debt and invest in growth, innovation and improve core operations (W3,O2O3O4). Change the capital structure to an optimal structure would yield a lower cost of capital. Since debt is cheaper than equity, and Carlsberg has less leverage, and also a lower pay back risk (NIBD/EBITDA) than its peers, the company could increase debt.

9.4 Weaknesses and Threats (--)

In this environment, three tactics and actions have been identified to minimise both internal weaknesses and external threats.

To optimize Carlsberg's operations and supply chain would not only make the company more competitive, but also it would provide a better market position, and mitigate the threats of internal rivalry and new entrants (W1W2,T3T5). If Carlsberg strengthens its core, the company would be in a

better competitive position in the established market. At the same time, Carlsberg would be fit to withstand the threat of the high number of microbreweries entering the market each year.

Develop new products that can expand the product portfolio. This could mitigate the threat of switch in consumer preferences and decrease the impact from substitute products (W5,T1T4). The strategy to minimise the impact of consumer preferences and the lack of products that cater to new consumer preferences can be minimised by investing in expanding the product portfolio. This has previously been stated in another strategy.

By pursuing optimal capital structure, it would increase competitiveness amongst competitors and increase shareholder value (W3,T3). An optimal capital structure will not only create a lower cost of capital and increase shareholder value, but also increase Carlsberg performance in a the competitive industry (Fosu, 2013).

9.5 TOWS Conclusion

Table 26 – TOWS matrix summary of key factors
Source: own creation, based on (Carlsberg, 2010-2017)

Internal Factors / External Factors	Strengths (S)	Weaknesses (W)
	S1 Large market share in Eatern Europe	**W1** Not optimal operations
	S2 Inovation in technology	**W2** High raw material and sales costs
	S3 Strong brand name	**W3** Non-optimal capital structure
	S4 Agile company structure	**W4** Mostly present in mature markets
	S5 Value chain procurement (CSC)	**W5** Lack of differentiation in products
Opportunities (O)	**SO Strategies**	**WO Strategies**
O1 Expand product portfolio	**S2,O1** Expand product portfolio	**W1W2,O4O5** Optimising core operation
O2 Market growth	**S3,O2** Focus on quality	**W4,O2** Focus on emergin markets
O3 Inovation and Knowledge	**S4,O4** Agile company structure	**W5,O3** Investment in innovation
O4 Core opertaions	**S5S2,O5** Value chain efficiency	**W3,O2O3O4** Increase debt and invest
O5 Cost reduction		
Threats (T)	**ST Strategies**	**WT Strategies**
T1 Changing consummer preferance	**S2S3S4,T1** Adapt to consumer choice	**W1W2,T3T5** Optimise core operations
T2 Political (law and taxes)	**S4,T2** Agile strategy to political issues	**W5,T1T4** Product development
T3 Internal rivalry (competition)	**S2S3S4,T3T4T5** First mover advantage	**W3,T3** Optimal capital structure
T4 Substitute products		
T5 Microbreweries		

Throughout the TOWS analysis, various strategies have been identified to increase company potential and mitigate downsides. Many of the strategies are closely related, which will be common, since many of the

internal and external factors are interlinked (Weihrich, 1982). From the analysis, five areas of strategies have been identified to have the most significant impact on Carlsberg future strategy. These are (1) Developing new products to suit consumer preferences and utilise the Danish heritage in the brand. (2) Optimise operation to the level of performance of the peers. (3) Focus on growth in markets with growth potential, such as Asian markets. (4) Pursue an optimal capital structure. (5) Maintain an agile company structure.

10. Scenario Analysis

In this chapter, different future strategic scenarios will be investigated, with a focus on what would happen if Carlsberg changed its strategy. The scenarios will be created on the findings from the analysis of the internal factors within the company, and the external factors that affects the company's performance in the market. Although, the scenarios are based on the prior analysis of Carlsberg, they should be viewed as hypothetic circumstances, where the attention is on the identified value drivers, which the analysts make assumptions on other variables. From the TOWS analysis various strategies have been identified that can improve Carlsberg's position in the competitive market. Five strategies have been valued to be significant for the company, where two strategies have been selected to form the scenarios presented in this chapter. The strategies are:

(1) Focus on growth in markets with growth potential, such as Asia.

(2) Optimise operation to the level of performance of the peers.

The reason for choosing these strategies is due to the possibility of directly measuring an effect in the DCF valuation model. Furthermore, the two strategies cover two different areas of Carlsberg's business, which are market growth and performance in core operations. From the scenarios, it would be possible to investigate the impact of change in the company's core operations and market strategy.

Each scenario will be estimated and presented as the most realistic scenario. Hereafter, a sensitivity analysis of the primary value drivers for each scenario will be used as best and worst case estimations.

10.1 Scenario 1. – Growth in Asia with Focus on China.

This scenario will present the case if Carlsberg would grow its market in Asia. Since Carlsberg's main market is China with a weight of 55% in Asia, it has been found realistic that this market would increase even further, as Carlsberg already is present in the market. In addition, China is the highest populated country in Asia with one of the highest GDP rate and with an expanding middle class, which creates a decent basis for Carlsberg to grow (Ch. 4.1.2.1). Carlsberg (2017a) states that growth in China will be a realistic case in the future, as the growth scenario is correspondingly stated in the SAIL '22 strategy (Carlsberg, 2017a). Although, SAIL '22 already focuses on growth in China, it is difficult to estimate how much the growth in this area will affect Carlsberg's total distribution of growth in the market's revenue shares.

In the presented model, the growth in the terminal period and the growth in the forecast period are the two variables that will be affected after increasing market shares in Asia. The change in the weight of the market distribution is based on the trends priory discovered in the various markets. As stated in chapter six, it was revealed that the Western European market's GDP is expected to decrease its rate of growth in the future. As seen in Table 27, the growth in GDP in this market is expected to decrease in the forecasting period. The Eastern European market is on the contrary expected to increase in growth in GDP over time. This is mainly due to the expected economic growth in Russian and Ukraine. Although this growth is expected, Carlsberg has a significant market share in these markets, which makes it difficult to increase the weight of the distribution growth rate even further. Asia is expected to experience a significant growth in GDP during the period. Since Carlsberg is present in the market, but does not have a major market share, there is an opportunity to increase the market share, as stated in the TOWS analysis. This has a relatively higher potential that the other markets, due to the higher level of GDP and the lower level of market shares.

Table 27 – Scenario 1: estimated GDP growth in ASIA
Source: own creation, based on (Carlsberg, 2011-2017)

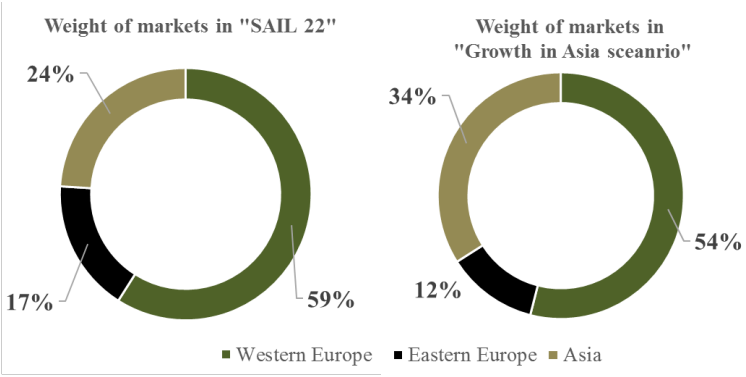
Terminal Period Growth	Historical Value Drivers							Forecasted Value Drivers					Average
	2011	2012	2013	2014	2015	2016	2017	2018E	2019E	2020E	2021E	2022E	2018E-2022E
SAIL 22													
Western Europe GDP	1,80%	-0,40%	0,30%	1,80%	2,30%	2,00%	2,30%	2,10%	1,80%	1,80%	1,70%	1,70%	1,82%
Market weight	58%	56%	57%	58%	60%	60%	59%	59%	59%	59%	59%	59%	
Eastern Europe GDP	4,87%	2,88%	1,56%	-0,49%	-3,48%	0,68%	1,96%	2,07%	2,06%	2,10%	2,16%	2,16%	2,11%
Market weight	31%	30%	29%	22%	17%	16%	17%	17%	17%	17%	17%	17%	
Asia GDP								4,45%	4,45%	4,45%	4,45%	4,45%	4,45%
Market weight	11%	14%	14%	19%	23%	24%	24%	24%	24%	24%	24%	24%	
Terminal Period Growth													**2,50%**
Growth in Asia													
Western Europe GDP	1,80%	-0,40%	0,30%	1,80%	2,30%	2,00%	2,30%	2,10%	1,80%	1,80%	1,70%	1,70%	1,82%
Market weight	58%	56%	57%	58%	60%	60%	59%	58%	57%	56%	55%	54%	
Eastern Europe GDP	4,87%	2,88%	1,56%	-0,49%	-3,48%	0,68%	1,96%	2,07%	2,06%	2,10%	2,16%	2,16%	2,11%
Market weight	31%	30%	29%	22%	17%	16%	17%	16%	15%	14%	13%	12%	
Asia GDP								4,45%	4,45%	4,45%	4,45%	4,45%	4,45%
Market weight	11%	14%	14%	19%	23%	24%	24%	26%	28%	30%	32%	34%	
Terminal Period Growth													**2,75%**

To simulate this scenario, it has been decided to increase the weight in distribution of the Asian growth rate with 2% per year in the forecast period. At the same time, it has been decided to decrease the weight in distribution of growth by 1% in both Western Europe and Eastern Europe. At the end of the forecast

period, it results in a distribution of market weight with an increase of 10 percentage points from a weight of 24% to 34% (arkets for the terminal period.

Figure 37). As seen in Table 27 this results in a new weighted average terminal growth rate of 2,75% amongst the markets for the terminal period.

Figure 37 – Scenario 1: change in revenue allocation (compared to Carlsberg 2017)
Source: own creation, based on (Ch.2.1.3, Carlsberg, 2017)



In the forecast period of scenario 1, it has been decided to change from increase in organic growth, as used in the SAIL '22 forecast, to an increase with an even growth in the forecast period towards the terminal growth of 2,75%. This will result in a higher growth in the forecast period. The reason for having an even growth towards a higher terminal growth, is because it would be unrealistic that an increased weight in China, which increases the terminal growth rate, would not influence the forecast period. This is illustrated in Table 28.

Table 28 – Scenario 1: difference in revenue growth (realistic vs. scenario 1)
Source: own creation, based on (Ch.6, Ch.10, Carlsberg, 2017)

Revenue Growth	Historical Value drivers							Forecasted Value drivers					Terminal Growth
	2011	2012	2013	2014	2015	2016	2017	2018E	2019E	2020E	2021E	2020E	
Realistic	5,84%	5,73%	-0,97%	-3,07%	1,31%	-4,19%	-1,29%	0,49%	0,97%	1,46%	1,94%	2,43%	2,50%
Scenario 1	5,84%	5,73%	-0,97%	-3,07%	1,31%	-4,19%	-1,29%	0,55%	1,10%	1,65%	2,20%	2,75%	2,75%

When changing the growth rate in the forecast period, it will affect the free cash flow. Since the forecast of the free cash flow is based on growth in revenue, revenue and costs will increase with the same ratio as in SAIL '22. Furthermore, investments and working capital will also increase, which will have a significant negative impact on the free cash flow, since the ΔCAPEX[8] and ΔNWC will be significantly

[8] Capital expenditures, investments.

higher. This results in a decrease in FCFF for the forecast period. Considering that, Carlsberg has to grow in a new market, it is found realistic that it will require the minimum of the same investment to organically grow revenue as in SAIL '22. Thus, it should be expected to see a decrease in FCFF, when growth increases. Although, an increase in growth in Asia would seem to require even larger investments, it has been decided that the level of investments compared to the revenue should remain the same. This is due to the information revealed in prior sections, that Carlsberg is already established within the market, and thus does not have to make large initial investment to enter the market. Additionally, Carlsberg states that the company will be focusing on organic growth in existing markets. Thereby, it can be argued that the most realistic scenario will be that Carlsberg maintain the same level of investments, when increasing its growth in Asia.

10.1.1 Scenario 1: Conclusion

Figure 38 illustrates that the new estimations of growth in forecast and terminal period will result in a share price of 919,95 DKK. This yields an upside potential compared to the market share price on the cut-off date of 28,66%. Due to the increase in ΔCAPEX and ΔNWC the forecast period has decreased from being 13,5% of the total value, to be 12,6%, as the increase in investments affects the free cash flow negatively.

Figure 38 – Scenario 1: DCF valuation
Source: own creation, based on (Ch.6, Ch.10, Carlsberg, 2017)

Dividends Cash Flow Model (DCF)	2018E	2019E	2020E	2021E	2022E	Terminal
Free cash flow to firm (FCFF)	4,653	5,105	5,058	5,026	5,007	6,559
WACC	6,135 %	6,135 %	6,135 %	6,135 %	6,135 %	6,135 %
Discount factor	0,9422	0,8877	0,8364	0,7881	0,7425	
Present value of FCFF	4,384	4,532	4,231	3,961	3,718	
Value of FCFF in forecast horizon	20,825					
Value of FCFF in terminal period	143,872					
Estimated enterprise value	164,697					
NIBD	-24,078					
Estimated market value of equity	**140,619**					
Shares outstanding 7/2/2018 (billion)	0,152856					
Estimated Share price DKK	**919,95**					
Share price on 7/2/2018 DKK	715					
Difference (upside potential)	28,66%					

As previously stated, the value of the share price is relatively more sensitive to change in WACC, as it is to a change in terminal growth. A best case and worst-case scenario is estimated to be within the range of the realistic span as seen in Figure 39.

Figure 39 – Scenario 1: sensitivity analysis: terminal growth vs. WACC
Source: own creation, based on (Ch.7)

	Growth	Pessimistic			Realistic		Optimistic	
WACC		2,00%	2,25%	2,50%	2,75%	3,00%	3,25%	3,50%
Optimistic	5,385%	1004,72	1056,02	1116,21	1187,82	1274,44	1381,34	1516,60
	5,635%	934,16	976,46	1025,51	1083,06	1151,52	1234,33	1336,54
	5,885%	872,69	907,85	948,21	995,00	1049,90	1115,22	1194,23
Realistic	6,135%	818,64	848,06	881,53	919,95	964,49	1016,74	1078,92
	6,385%	770,76	795,51	823,44	855,22	891,69	933,97	983,59
	6,635%	728,04	748,94	772,37	798,82	828,90	863,43	903,46
Pessimistic	6,885%	689,69	707,40	727,13	749,24	774,20	802,59	835,17

As expected, an increase in the growth rate in the terminal and forecast period would yield a higher share price. Considering a significant change in the distribution of the market weight, where the weight of growth in Asia has been increased by 10 percentage points, which directly influences the terminal growth, it does not have a significant impact on change in share price. This scenario results in an increase in share price of 4,94% according to the realistic case, and an increase of 6,14% in a realistic best-case scenario.

10.2 Scenario 2. – Cost Reduction in Core Operations

This scenario will present the case where Carlsberg reduces costs and optimises within the company's core operation to a competitive level. From the financial analysis of Carlsberg's performance, in chapter four, it was revealed that Carlsberg in many areas underperformed compared to its peers. It was also concluded that Carlsberg did not seem to fully benefit from its ability of operating on a level of economies of scale, which has significance for a company of this size. The underperformance compared to peers can be seen from the TOWS analysis to create opportunities for Carlsberg in the area of sales and distribution. To optimise in the core operations is also describe in the SAIL '22 strategy (Carlsberg, 2017a). From the provided information, it has been estimated in the forecast period in chapter six, that Carlsberg would improve its core operations. According to historical data, the increase in sales & marketing costs, and the decrease in distribution costs directly offset one another, which inconclusively did not show any improvements. This leads to presumption that it does not seem realistic that Carlsberg would be able to improve its core operations, relatively to its peers, within the forecast period. On the contrary, this

scenario will be built on the assumption that Carlsberg achieves the level of cost reduction to a similar level, where the effect of this improvement will be investigated.

Table 29 – Scenario 2: change in operational value drivers
Source: own creation, based on (Ch.6, Ch.10, Carlsberg, 2017)

Cost drivers (margins)	Historical Value Drivers							Forecasted Value Drivers				
	2011	2012	2013	2014	2015	2016	2017	2018E	2019E	2020E	2021E	2022E
Revenue growth	**5,84%**	**5,73%**	**-0,97%**	**-3,07%**	**1,31%**	**-4,19%**	**-1,29%**	**0,49%**	**0,97%**	**1,46%**	**1,94%**	**2,43%**
SAIL 22												
Cost of sales	45,91%	46,23%	46,22%	46,25%	46,43%	44,60%	43,78%	43,53%	43,27%	43,01%	42,76%	42,50%
Sales and distribution	27,92%	28,01%	26,93%	27,81%	27,99%	27,85%	27,71%	27,74%	27,74%	27,74%	27,74%	27,74%
Administration	5,95%	5,98%	6,22%	6,42%	6,29%	7,61%	7,14%	7,01%	6,88%	6,76%	6,63%	6,50%
Other income and expenses	0,56%	0,37%	0,19%	0,69%	0,36%	0,32%	0,18%	0,38%	0,38%	0,38%	0,38%	0,38%
Income before tax from asociates	0,27%	0,17%	0,16%	0,63%	0,56%	0,52%	0,42%	0,39%	0,39%	0,39%	0,39%	0,39%
Operating profit before special items	**21,12%**	**20,36%**	**21,02%**	**21,01%**	**20,49%**	**20,94%**	**22,15%**	**22,49%**	**22,87%**	**23,26%**	**23,64%**	**24,03%**
Scenario 2 - Cost reduction.												
Cost of sales	45,91%	46,23%	46,22%	46,25%	46,43%	44,60%	43,78%	43,52%	43,26%	43,00%	42,74%	42,48%
Sales and distribution	27,92%	28,01%	26,93%	27,81%	27,99%	27,85%	27,71%	25,35%	23,00%	20,64%	18,29%	15,93%
Administration	5,95%	5,98%	6,22%	6,42%	6,29%	7,61%	7,14%	6,74%	6,34%	5,94%	5,54%	5,14%
Other income and expenses	0,56%	0,37%	0,19%	0,69%	0,36%	0,32%	0,18%	0,18%	0,18%	0,18%	0,18%	0,18%
Income before tax from asociates	0,27%	0,17%	0,16%	0,63%	0,56%	0,52%	0,42%	0,44%	0,46%	0,48%	0,50%	0,52%
Operating profit before special items	**21,12%**	**20,36%**	**21,02%**	**21,01%**	**20,49%**	**20,94%**	**22,15%**	**25,01%**	**28,05%**	**31,08%**	**34,11%**	**37,15%**

First, it has been decided to have a similar level of coast of sales as in SAIL '22, which includes cost of raw material, labour and other manufacturing costs. The reason not to change this variable is due to the level is similar compared to the peer group, which previously was elaborated in chapter four. Sales and distribution costs has previously been identified as one of the most significant cost in Carlsberg's operations. As seen in Table 29 the costs have been reduced over the forecast period, from the essential level of 27,72% of revenue to 15,93% of revenue in year 2022, which resembles the average level in the peer group. Such a reduction in costs is expected to create a substantial change in Carlsberg's company structure, which arguably seems as a realistic case, since Carlsberg has proven from various cases that the company is agile and is able to do radical restructuring.

Administration, Other income & expenses and Income from associates are also expected to reach the average level of the peer group in year 2022, but are less significant than Sales and Distribution costs. The reason behind the smoothly decrease in costs towards 2022 is due to purpose of modelling the scenario in the most realistic way. I can be argued that it is more realistic that Carlsberg decrease its costs over a period of five years, in comparisons to the similar decrease in costs over one year.

A reduction in costs in core operations affects both the FCFF from the forecast and terminal period. Table 30 show a significant improvement in FCFF of 121,80% in year 2022.

Table 30 – Scenario 2: difference from realistic valuation estimates
Source: own creation, based on (Ch.6, Ch.10, Carlsberg, 2017)

Cost drivers (margins)	Forecast period					Terminal period
	2018E	2019E	2020E	2021E	2022E	
FCF - SAIL 22	4,697	5,191	5,186	5,196	5,219	6,691
FCF - Cost reduction scenario	5,840	7,557	8,816	10,149	11,576	13,208
Difference %	24,34%	45,57%	69,98%	95,33%	121,80%	97,38%

It can be discussed how likely the increase of 121,80% would be if Carlsberg were to reduce its costs. The model assumes that reducing costs does not influence the growth in revenue. Since the costs being reduced are majorly sales costs, it would be expected that it would have an effect on the overall sales performance on the company. To be able to challenge this hypothesis it would be necessary to gain access to the sales cost distribution and profitability in Carlsberg, and furthermore do an extensive analysis of Carlsberg's marketing strategy. This has not been possible, due to lack of information provided by Carlsberg, and the limited scope of the thesis. Because of this, the model assumes the same development in growth in revenue as in SAIL '22, and thought this might cause a bias, the model will still be used with the bias in mind.

Additionally, a reduction of costs in operations would require major restructuring and thereby increase in restructuring costs, which cannot be estimated from the information available. An example of how this scenario would affect the company structure can be seen from the increase in equity. According to the model, the equity would increase to a total of 94% of total invested capital in the terminal period, due to the cash surplus paying back debt (Appendix 31-35). This seems unlikely. Some substantial restructuring are likely to occur in the process of optimising core operations, resulting in a decrease of the cash surplus. This would further decrease the growth in equity.

10.2.1 Scenario 2: Conclusion

Figure 40 shows that the cost reduction in core operations, which both affect the forecast and terminal period, will result in a share price of 1844,84DKK (Appendix 36-40). This yields an upside potential in Carlsberg of 158,02% compared to the share price on the cut-off date. The value of the forecast period amounts to 11,8% of the total value of the company, which reveals a lower impact of the forecasting period compared to SAIL '22.

Figure 40 – Scenario 2: DCF valuation
Source: own creation, based on (Ch.6, Ch.10, Carlsberg, 2017)

Dividends Cash Flow Model (DCF)	2018E	2019E	2020E	2021E	2022E	Terminal
Free cash flow to firm (FCFF)	5,840	7,557	8,816	10,149	11,576	13,208
WACC	6,135 %	6,135 %	6,135 %	6,135 %	6,135 %	6,135 %
Discount factor	0,9422	0,8877	0,8364	0,7881	0,7425	
Present value of FCFF	5,502	6,709	7,374	7,998	8,596	
Value of FCFF in forecast horizon	36,179					
Value of FCFF in terminal period	269,893					
Estimated enterprise value	306,073					
NIBD	-24,078					
Estimated market value of equity	**281,995**					
Shares outstanding 7/2/2018 (billion)	0,152856					
Estimated Share price DKK	**1844,84**					
Share price on 7/2/2018 DKK	715					
Difference (upside potential)	158,02%					

Since a reduction in costs have an impact on the profitability in Carlsberg, a sensitivity analysis based on the variable EBITDA and growth is found suitable. A best and worst case scenario estimated to be within the range of the realistic span of the calculated share price values, as seen in Figure 41.

Figure 41 – Scenario 2: sensitivity analysis: terminal growth vs. EBITDA margin
Source: own creation

	Growth	Pessimistic		Realistic			Optimistic	
EBITDA		1,75%	2,00%	2,25%	2,50%	2,75%	3,00%	3,25%
Pessimistic	36,26%	1561,36	1629,83	1707,12	1795,05	1895,97	2013,00	2150,31
	36,51%	1575,01	1644,35	1722,61	1811,65	1913,84	2032,33	2171,38
	36,76%	1588,67	1658,87	1738,10	1828,24	1931,70	2051,67	2192,44
Realistic	37,01%	1602,32	1673,38	1753,59	1844,84	1949,57	2071,01	2213,50
	37,26%	1615,98	1687,90	1769,08	1861,43	1967,43	2090,34	2234,57
	37,51%	1629,63	1702,41	1784,57	1878,03	1985,30	2109,68	2255,63
Optimistic	37,76%	1643,29	1716,93	1800,06	1894,62	2003,16	2129,02	2276,70

Although the cost reduction results in a higher EBITDA, change in growth has a larger impact on the share price than a change in EBITDA. The new scenario has resulted in a major increase in share price in all cases by more than a 100% within the realistic span. This illustrates that optimising core operations is an effective value adding strategy.

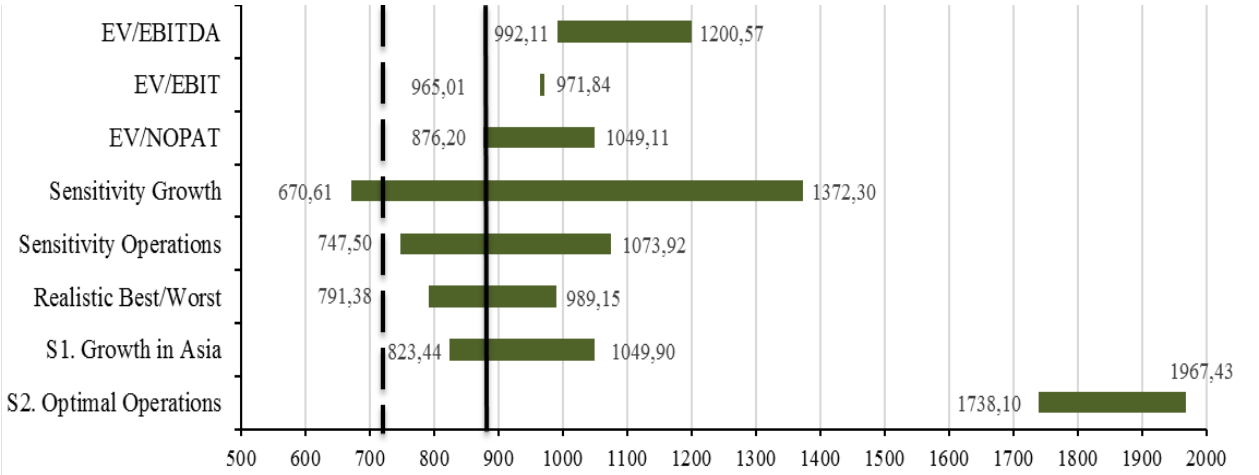
Considering EBITDA being less sensitive compared to growth, and the substantial share price increase, it can be discussed how realistic this scenario is. Assumptions such as an unchanged growth rate in revenue could have a more significant impact on the share price. Furthermore, it has not been taken into account

that it might require further restructuring costs to reduce costs in Carlsberg, which would affect the share price negatively. What is evident from the cost reduction scenario is that Carlsberg has a major potential for cost reduction that eventually can unlock excessive value for the company.

10.3 Summary of Valuations

Throughout the thesis, Carlsberg has been analysed and valued by different valuation methods, which have provided a range of values, which are shown in Figure 42. The figure illustrates how the different value ranges compares to each other, and in comparisons to the estimated realistic share price (black line) and the share price of the cut-off date (dashed line). The value ranges are based on the span identified in sensitivity analysis or highest and lowest calculated values (multiples). What is noticeable is that the majority of calculated value ranges are showing values above the actual share price on the cut-off date. This indicates that the thesis generally is overvaluing Carlsberg in comparison to the market.

Figure 42 – Value range: summary of all estimated valuations
Source: own creation, based on (Ch.6, Ch.10, Carlsberg, 2017 (Bloomberg, 2018))



What is furthermore noticeable is that both the share price on the cut-off date and the value calculated from the DCF and EVA models are undervalue compared to the relative multiple valuations, based on the peer group. This does not come as a surprise, since Carlsberg has been revealed to be underperforming compared to the peer group in various areas of the company's core operations.

Scenario 1. Based on the assumption of increasing market growth in Asia, shows a little variation from the ranges of the valuation based on SAIL '22, where the estimated realistic value for Carlsberg is within the range. In addition, it shows a minor increase in value due to the increase growth in both forecast and

terminal period, which contributes to an insignificant growth in an overall perspective. However scenario 2, demonstrates a much higher value range in comparison to all other estimated value ranges. Although it has been investigated that the driver of this valuation, the change in EBITDA, is the least sensitive to marginal change, the significant change, that comes with reducing cost to the level of the peers, is the reason for the relatively high value range.

The vast difference between the two scenarios indicates that Carlsberg has a higher possibility to realistically increase its value by focusing on optimising and reducing costs, relatively to pursuing a market growth in Asia. This argument can be based on that Carlsberg has a significant opportunity to improve its core operations, which is proven possible by the average in the peer group. In order to create a value increase to the same extent by growing the market share in Asia, would require a minimum terminal growth rate of 4,8%, to reach the worst-case in scenario 2. After analysing the potential long-term growth in the market a growth rate of 4,8% does not seem realistic. Additionally, it can be argued that pursuing growth in Asia would arguably provide comparably higher uncontrollable risk. As identified throughout the thesis many uncontrollable macro-economic factors affect the markets beer companies operate in. These macro-economic factors arguably affect the core operation less, relatively to market growth. From these findings, it would be more beneficial for Carlsberg to focus on the significant upside potential that the company has by strengthening the core operations.

11. Conclusion

The purpose of the thesis was to answer the main problem statement:

What is the enterprise value and share price of Carlsberg on the 7th of February 2018, and what effect could changing the strategy have for the value of the company?

The results were based on a financial and strategic fundamental analysis of Carlsberg's historical performance, development and strategic positions. Through the analysis, different value drivers were identified, which formed the assumptions for the forecast of Carlsberg's estimated future cash flows. Carlsberg's value was estimated through a DCF and EVA valuation, and further compared in a relative valuation. Based on the previous analyses, realistic scenarios where created to show how strategic changes could influence the value.

Throughout the financial analysis, it was identified that Carlsberg is not performing to the level of its peers. It was evident that areas in their core operations, such as sales & marketing and distribution costs were significantly higher, which has significant impact on the profitability. In addition, it was discovered that impairment of brand losses resulted in an increase in ROIC in the short term, although impairment is not seen as a directly value adding action. Furthermore, value drivers were uncovered, where optimisation of the value chain and core operations, inventory control (JIT) and cost of capital are found to have a significant impact of the value driven in Carlsberg. It was uncovered in the strategic analysis that Carlsberg's strong market position in Eastern Europe, high level of innovation in product development, strong brands and agile company structure, are seen as strengths for the company. Whereas, the high costs in core operations is a significant weakness. In addition, Carlsberg has growth opportunities in Asian markets, where the company is already present. Threats compromising Carlsberg's growth are identified as the fierce competition in the market, occurrence of political regulations, a high level of substitute products and the overall stagnation in consumption in the beer market.

Carlsberg's cost of capital was computed to be 6,134%, which contributed to an EV of 158,081bn DKK and a share price of 876,66DKK, showing a potential upside of 22,61%, compared to the share price on the cut-off date (715DKK). From the scenarios created it was evident that Carlsberg would benefit more from optimising the company's core operations, in comparisons to increasing growth in Asian markets. This decision would additionally expose Carlsberg to less external risk. From the results, it is concluded that Carlsberg is undervalued in the market, and the analysts would recommend the Carlsberg's A & B stock to be an investment opportunity.

12. The Thesis in Perspective

After analysing Carlsberg position in the industry, and estimating the company's fundamental EV and share price, remarkable areas of the industry and Carlsberg have been revealed, which would be interesting to further investigate.

First of all, various events within the historical period, both industry and company specific, have challenged the analysis, since the analysis is based on historical trends. These incidents, such as AB InBev's acquisition of SAB Miller and Carlsberg's turnaround strategy, SAIL 22', have both provided motivation for the thesis, but also challenged the predictions for the future. If the historical period analysed, provided a steady state for both companies and industry, it would potentially have limited the assumptions, and improved the projected estimates for the valuation. Although, an industry with a high level of competition, showing a long term historical steady state, would not be realistic to find, since companies within the industry would have to innovate and develop to stay competitive.

Another noteworthy area to be researched would be the agenda behind Carlsberg's strategy to significantly deviate from the average capital structure within the industry. A hypothesis could be that Carlsberg is expecting a downturn in the economy in the nearest future, which would affect the cost of debt. Another interesting hypothesis could be that Carlsberg pays down its debt to prepare for a significantly large acquisition. Although, Carlsberg states that the focus would be on organic growth, the company also contradictory states that it would deviate from the organic growth strategy, if value-enhancing acquisitions opportunities would arise (Carlsberg, 2017d). Thus, it would be interesting to investigate what company would be a suitable acquisition for Carlsberg, and what value such acquisition would provide. Additionally, it would be interesting to furthermore investigate, what impact changing to the estimated optimal capital structure would have on the value of Carlsberg. It is presumed that it would not only change the weight of debt and equity in WACC, but also increase debt in the company significantly, which would result in strategic investment opportunity for the company. Due to the limits of the paper, it would not be possible to explore this scenario, but the case would be a motivation for further studies.

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14. Appendices

Appendix 1: Figures and Tables

Appendix 2: Abbreviations

AB InBev - Anheuser-Bush InBev
APAC - Asian Pacific
ASEAN – Association of Southeast Asian Markets
ATO – Asset Turnover Rate
BVE – Book Value of Equity
CAPM – Capital Asset Pricing Model
CCA – Contemporary Competitive Advantage
CD – Competitive Disadvantage
CP – Competitive Parity
CSC - Carlsberg Supply Company
DCF – Discounted Cash Flow
EBITDA – Earnings before Interest, Tax, Depreciation and Amortisation
EBIT – Earnings before Interest and Tax
EV- Enterprise Value
EVA – Economic Value Added
EU – European Union
FCFF – Free Cash Flow Firm
FDI - Foreign Direct Investments
GDP – Gross Domestic Product
IAS - International Accounting Standards
IFRS – International Financial Reporting Standards
JIT – Just In Time
MC - Molson Coors
MCP - Meridian Compensation Partners
MFS - Massachusetts Financial Services
MRP – Market Risk Premium
NBC – Net Borrowing Costs
NIBD - Net Interest Bearing Debt
NOPAT – Net Operating Profit after Tax
PEST - Political, Economic, Social and Technological
PET – Polyethylene Terephthalate
ROA - Return on Assets
ROE - Return on Equity
ROIC - Return on Invested Capital
SCA – Sustainable Competitive Advantage
SWOT – Strengths, Weaknesses, Opportunities and Threats
WACC – Weighted Average Cost of Capital
WHO – World Health Organisation

Appendix 3: Carlsberg – Analytical Income Statement

Analytical Income Statement Carlsberg

DKK million	2011	2012	2013	2014	2015	2016	2017
Revenue	86,555	93,100	93,732	91,569	91,012	86,957	86,942
Excise duties on beer and soft drinks etc.	-22,994	-25,899	-27,180	-27,063	-25,658	-24,343	-25,134
Net revenue	**63,561**	**67,201**	**66,552**	**64,506**	**65,354**	**62,614**	**61,808**
Cost of Sales	-29,183	-31,065	-30,759	-29,835	-30,341	-27,928	-27,062
Gross Profit	**34,378**	**36,136**	**35,793**	**34,671**	**35,013**	**34,686**	**34,746**
Sales and distribution expenses	-17,746	-18,825	-17,922	-17,937	-18,290	-17,438	-17,125
Administrative expenses	-3,783	-4,017	-4,140	-4,140	-4,109	-4,764	-4,413
Other operating activites, net	0,357	0,246	0,129	0,444	0,235	0,198	0,113
Share profit after tax of associates and joint ventures	0,174	0,112	0,104	0,405	0,364	0,324	0,262
Tax on profit from associates and joint ventures	0,044	0,027	0,027	0,110	0,178	0,107	0,108
Operating profit before special items	**13,424**	**13,679**	**13,991**	**13,553**	**13,391**	**13,113**	**13,691**
Special items, net	0,929	-0,922	-0,104	-0,417	-0,569	1,458	0,123
EBITDA	**14,353**	**12,757**	**13,887**	**13,136**	**12,822**	**14,571**	**13,814**
Depriciation, amortisation and impairment losses	-3,827	-4,633	-4,351	-4,926	-7,080	-5,968	-4,595
Transitory Item: Impairment of brand (Baltika breweries	-	-	-	-	-4,000	-	-4,800
Transitory Item: Goodwill China	-	-	-	-	-1,766	-	-
EBIT	**10,526**	**8,124**	**9,536**	**8,210**	**-0,024**	**8,603**	**4,419**
Core EBIT	**10,526**	**8,124**	**9,536**	**8,210**	**5,742**	**8,603**	**9,219**
Corporate tax	-2,156	-1,529	-2,086	-1,883	-0,849	-2,392	-1,458
Tax on profit from associates and joint ventures	-0,044	-0,027	-0,027	-0,110	-0,178	-0,107	-0,108
Tax shield, net financial expences	-0,480	-0,417	-0,394	-0,318	0,750	-0,411	-0,326
NOPAT	**7,846**	**6,151**	**7,029**	**5,899**	**-0,301**	**5,693**	**2,527**
Core NOPAT	**7,846**	**6,151**	**7,029**	**5,899**	**5,465**	**5,693**	**7,327**
Financial income	0,634	0,918	0,725	0,820	0,490	0,919	0,803
Financial expences	-2,542	-2,653	-2,237	-1,989	-2,021	-2,166	-1,591
Net financial expences	**-1,908**	**-1,735**	**-1,512**	**-1,169**	**-1,531**	**-1,247**	**-0,788**
Tax on net financial expences	0,480	0,417	0,394	0,318	-0,750	0,411	0,326
Net financial expences after tax	**-1,428**	**-1,318**	**-1,118**	**-0,851**	**-2,281**	**-0,836**	**-0,462**
Net earnings	**6,418**	**4,833**	**5,911**	**5,048**	**-2,582**	**4,857**	**2,065**

Depriciation, amortisation and impariment losses

DKK million	2011	2012	2013	2014	2015	2016	2017
Cost of sale	-2,605	-2,766	-2,863	-2,890	-3,088	-3,267	-3,263
Sales and distribution	-0,737	-0,820	-0,795	-0,758	-0,868	-1,038	-0,980
Administrative expences	-0,161	-0,157	-0,324	-0,450	-0,800	-0,456	-0,464
Special items	-0,324	-0,890	-0,369	-0,828	-8,090	-1,207	-4,688
Total D, M and I losses	**-3,827**	**-4,633**	**-4,351**	**-4,926**	**-12,846**	**-5,968**	**-9,395**

Tax

DKK million	2011	2012	2013	2014	2015	2016	2017
EBT	8,574	6,362	7,997	6,931	-1,733	7,249	3,523
Corporation tax	2,156	1,529	2,086	1,883	0,849	2,392	1,458
Effective tax rate	**25,1%**	**24,0%**	**26,1%**	**27,2%**	**-49,0%**	**33,0%**	**41,4%**

Appendix 4: Carlsberg – Analytical Balance Sheet

Analytical Balance Sheet

DKK million	2011	2012	2013	2014	2015	2016	2017
Operating Assets							
Non-current assets							
Intangible assets	77,834	80,01	80,675	70,536	72,920	76,736	67,793
Property, plant and equipment	30,890	31,034	32,505	28,545	26,678	25,810	24,325
Investments in asscociates and JV	5,007	5,768	1,879	3,779	4,676	4,701	4,266
Receivables	1,649	2,075	2,079	2,116	1,854	1,071	0,952
Deferred tax assets	0,871	1,192	1,122	1,280	1,697	1,610	1,663
Total non-current operating assets	**116,251**	**120,079**	**118,26**	**106,256**	**107,825**	**109,928**	**98,999**
Current assets							
Inventories	4,350	4,541	4,762	4,498	3,817	3,963	3,834
Trade receivables	7,870	7,872	7,902	6,879	5,729	5,485	4,611
Tax reveivables	0,129	0,060	0,203	0,196	0,324	0,278	0,181
Other receivables	3,250	2,631	2,947	3,685	2,532	2,488	2,138
Prepayments	0,867	0,853	1,566	0,977	1,074	1,137	1,026
Total current operating assets	**16,466**	**15,957**	**17,380**	**16,235**	**13,476**	**13,351**	**11,790**
Total assets	**132,717**	**136,036**	**135,640**	**122,491**	**121,301**	**123,279**	**110,789**
Non-interest-bearing debt							
Deferred tax liabilities	8,870	8,930	8,175	6,442	5,924	6,250	5,601
Provisions	0,965	1,097	1,128	2,552	3,374	3,642	3,611
Other liabilities	1,087	1,201	1,354	1,442	1,899	3,199	3,757
Trade payables	11,039	11,906	12,954	12,034	12,260	13,497	13,474
Deposits on returnable packaging	1,291	1,381	1,630	2,046	1,819	1,681	1,576
Provisions	0,503	0,574	0,499	0,448	0,648	0,722	0,591
Corporate tax	0,533	0,551	0,547	0,780	0,601	0,935	0,931
Other liabilities etc.	10,570	9,624	9,277	9,311	9,794	8,233	7,645
Total non-interest-bearing debt	**34,858**	**35,264**	**35,564**	**35,055**	**36,319**	**38,159**	**37,186**
Invested capital (Net operating assets)	**97,859**	**100,772**	**100,076**	**87,436**	**84,982**	**85,120**	**73,603**
Financial Assets							
Equity							
Total equity	**61,335**	**62,918**	**60,751**	**45,388**	**47,231**	**53,65**	**49,525**
Interest-bearing debt (NIBD)							
Borrowings non-current	34,137	36,479	30,464	38,480	31,479	21,137	23,340
Retirement benefit obligations and similar obligations	3,218	3,917	3,048	4,538	5,235	4,878	3,351
Borrowings current	2,591	3,352	9,520	1,820	4,549	9,067	0,849
Liabilities associated with assets held for sale	0,056	0,018	-	-	0,088	0,015	-
Interest-bearing debt	**40,002**	**43,766**	**43,032**	**44,838**	**41,351**	**35,097**	**27,540**
Interest-bearing assets							
Securities non-current	0,106	0,112	-	-	-	-	-
Retirement benifit plan assets	0,005	0,004	-	-	-	-	-
Securities current	0,024	0,021	-	-	-	-	-
Cash and cash equivalents	3,108	5,748	3,707	2,418	3,131	3,502	3,462
Assets held for sale	0,235	0,027	-	0,372	0,469	0,125	-
Interest-bearing assets	**3,478**	**5,912**	**3,707**	**2,790**	**3,600**	**3,627**	**3,462**
Net-interest-bearing debt (NIBD)	**36,524**	**37,854**	**39,325**	**42,048**	**37,751**	**31,470**	**24,078**
Invested Capital	**97,859**	**100,772**	**100,076**	**87,436**	**84,982**	**85,120**	**73,603**

Appendix 5: Carlsberg – Ratios

Carlsberg Profitability Analysis

ROIC	2011	2012	2013	2014	2015	2016	2017
ROIC after tax	8,0%	6,1%	7,0%	6,7%	6,4%	6,7%	10,0%
ROIC before tax	10,8%	8,1%	9,5%	9,4%	6,8%	10,1%	12,5%
Ratios							
Profit Margin after tax	12,3%	9,2%	10,6%	9,1%	8,4%	9,1%	11,9%
Profit Margin before tax	16,6%	12,1%	14,3%	12,7%	8,8%	13,7%	14,9%
Turnover rate IC	0,65	0,67	0,67	0,74	0,77	0,74	0,84
Turnover rate IC days	554	540	541	488	468	489	429
ROE	10,5%	7,7%	9,7%	11,1%	-5,5%	9,1%	4,2%
ROE (ROIC formula)	10,5%	7,7%	9,7%	11,1%	6,7%	9,1%	13,9%
Net borrowing cost (NBC)	-3,9%	-3,5%	-2,8%	-2,0%	-6,0%	-2,7%	-1,9%
Financial leverage	0,60	0,60	0,65	0,93	0,80	0,59	0,49
NWC	-6,929	-5,662	-13,34	-7,786	-13,064	-17,282	-9,814
NWC Turnover	-9,17	-11,87	-4,99	-8,28	-5,00	-3,62	-6,30
Quick ratio	0,51	0,47	0,51	0,48	0,38	0,37	0,33
Interest coverage ratio	5,52	4,68	6,31	7,02	3,75	6,90	11,70
Current ratio	0,74	0,79	0,61	0,71	0,56	0,49	0,61

Common-size analysis	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**
Net revenue	**63,561**	**67,201**	**66,552**	**64,506**	**65,354**	**62,614**	**61,808**
Cost of Sales	-45,9%	-46,2%	-46,2%	-46,3%	-46,4%	-44,6%	-43,8%
Gross Profit	**54,1%**	**53,8%**	**53,8%**	**53,7%**	**53,6%**	**55,4%**	**56,2%**
Sales and distribution expenses	-27,9%	-28,0%	-26,9%	-27,8%	-28,0%	-27,9%	-27,7%
Administrative expenses	-6,0%	-6,0%	-6,2%	-6,4%	-6,3%	-7,6%	-7,1%
Other operating activites, net	0,6%	0,4%	0,2%	0,7%	0,4%	0,3%	0,2%
Share profit after tax of assoc	0,3%	0,2%	0,2%	0,6%	0,6%	0,5%	0,4%
Tax on profit from associates a	0,1%	0,0%	0,0%	0,2%	0,3%	0,2%	0,2%
Operating profit before spe	**21,1%**	**20,4%**	**21,0%**	**21,0%**	**20,5%**	**20,9%**	**22,2%**
Special items, net	1,5%	-1,4%	-0,2%	-0,6%	-0,9%	2,3%	0,2%
EBITDA-margin	**22,6%**	**19,0%**	**20,9%**	**20,4%**	**19,6%**	**23,3%**	**22,4%**
Depriciation, amortisation and	-6,0%	-6,9%	-6,5%	-7,6%	-10,8%	-9,5%	-7,4%
EBIT-margin	**16,6%**	**12,1%**	**14,3%**	**12,7%**	**8,8%**	**13,7%**	**14,9%**
Corporate tax	-3,4%	-2,3%	-3,1%	-2,9%	-1,3%	-3,8%	-2,4%
Tax on profit from associates a	-0,1%	0,0%	0,0%	-0,2%	-0,3%	-0,2%	-0,2%
Tax shield, net financial expen	-0,8%	-0,6%	-0,6%	-0,5%	1,1%	-0,7%	-0,5%
NOPAT-margin	**12,3%**	**9,2%**	**10,6%**	**9,1%**	**8,4%**	**9,1%**	**11,9%**
Financial income	1,0%	1,4%	1,1%	1,3%	0,7%	1,5%	1,3%
Financial expences	-4,0%	-3,9%	-3,4%	-3,1%	-3,1%	-3,5%	-2,6%
Net financial expences	**-3,0%**	**-2,6%**	**-2,3%**	**-1,8%**	**-2,3%**	**-2,0%**	**-1,3%**
Tax on net financial expences	0,8%	0,6%	0,6%	0,5%	-1,1%	0,7%	0,5%
Net financial expences after	**-2,2%**	**-2,0%**	**-1,7%**	**-1,3%**	**-3,5%**	**-1,3%**	**-0,7%**
Net earnings	**10,1%**	**7,2%**	**8,9%**	**7,8%**	**-4,0%**	**7,8%**	**3,3%**

Appendix 6: Royal Unibrew – Analytical Income Statement

Analytical Income Statement Royal Unibrew

DKK million	2011	2012	2013	2014	2015	2016	2017
Net revenue	**3,431**	**3,430**	**4,481**	**6,056**	**6,032**	**6,340**	**6,384**
Cost of Sales	-1,610	-1,627	-2,091	-2,711	-2,671	-2,856	-2,892
Gross Profit	**1,821**	**1,803**	**2,390**	**3,345**	**3,361**	**3,484**	**3,493**
Sales and distribution expenses	-1,052	-1,040	-1,394	-1,903	-1,835	-1,900	-1,872
Administrative expenses	-0,176	-0,158	-0,251	-0,312	-0,301	-0,278	-0,258
Other operating income	0,004	0,005	0,003	-	-	-	-
Other operating expenses	-	-	-0,015	-	-	-	-
EBITDA	**0,596**	**0,609**	**0,732**	**1,130**	**1,225**	**1,306**	**1,362**
Depriciation, amortisation and impairment losses	-0,122	-0,124	-0,172	-0,304	-0,308	-0,305	-0,293
EBIT	**0,474**	**0,485**	**0,560**	**0,826**	**0,917**	**1,001**	**1,069**
Corporate tax	-0,110	-0,108	-0,069	-0,176	-0,191	-0,214	-0,225
Tax shield, net financial expences	-0,007	-0,009	-0,006	-0,013	-0,010	-0,007	-0,007
NOPAT	**0,357**	**0,368**	**0,486**	**0,636**	**0,716**	**0,780**	**0,837**
Income after tax from investments in associates	0,014	0,034	0,034	0,035	0,031	0,028	0,018
Financial income	0,040	0,006	0,004	0,008	0,009	0,004	0,003
Financial expences	-0,068	-0,044	-0,050	-0,069	-0,054	-0,035	-0,034
Net financial expences	**-0,028**	**-0,038**	**-0,045**	**-0,060**	**-0,046**	**-0,031**	**-0,031**
Tax on net financial expences	0,007	0,009	0,006	0,013	0,010	0,007	0,007
Net financial expences after tax	**-0,007**	**0,005**	**-0,006**	**-0,012**	**-0,005**	**0,004**	**-0,006**
Net earnings	**0,351**	**0,373**	**0,480**	**0,624**	**0,711**	**0,784**	**0,831**

Depriciation, amortisation and impariment losses

DKK million	2011	2012	2013	2014	2015	2016	2017
Production	-0,075	-0,087	-0,104	-0,195	-0,187	-0,197	-0,192
Sales and distribution expenses	-0,033	-0,022	-0,054	-0,085	-0,087	-0,081	-0,084
Administrative expences	-0,014	-0,015	-0,013	-0,024	-0,034	-0,026	-0,017
Total D, M and I losses	**-0,122**	**-0,124**	**-0,172**	**-0,304**	**-0,308**	**-0,305**	**-0,293**

Tax

DKK million	2011	2012	2013	2014	2015	2016	2017
EBT	0,461	0,481	0,548	0,801	0,902	0,998	1,056
Corporation tax	0,110	0,108	0,069	0,176	0,191	0,214	0,225
Effective tax rate	**23,9%**	**22,5%**	**12,5%**	**22,0%**	**21,2%**	**21,4%**	**21,3%**

Appendix 7: Royal Unibrew – Analytical Balance Sheet

Analytical Balance Sheet

DKK million	2011	2012	2013	2014	2015	2016	2017
Operating Assets							
Non-current assets							
Intangible assets	0,391	0,371	2,944	2,941	2,920	2,884	2,862
Project development properties	0,411	0,276	0,291	0,238	0,198	-	-
Other property, plant and equipment	1,190	1,203	2,418	2,331	2,241	2,142	2,122
Investments in associates	0,291	0,130	0,133	0,136	0,135	0,144	0,128
Other fixed asset investments	0,008	0,012	0,024	0,017	0,012	0,010	0,010
Total non-current assets	**2,291**	**1,992**	**5,810**	**5,664**	**5,505**	**5,180**	**5,121**
Current assets							
Inventories	0,173	0,180	0,330	0,312	0,317	0,336	0,335
Receivables	0,394	0,379	0,506	0,536	0,570	0,534	0,587
Corporation tax	-	0,009	0,012	-	-	-	0,016
Prepayments	0,013	0,014	0,023	0,020	0,022	0,019	0,034
Total current operating assets	**0,581**	**0,582**	**0,871**	**0,868**	**0,909**	**0,889**	**0,973**
Total operating assets	**2,872**	**2,574**	**6,681**	**6,532**	**6,414**	**6,069**	**6,094**
Non-interest-bearing debt							
Deferred tax	0,167	0,145	0,458	0,432	0,375	0,362	0,378
Other payables	0,023	0,009	0,017	0,025	0,014	0,014	0,013
Trade payables	0,398	0,431	0,807	0,811	0,914	0,858	1,026
Corporate tax	0,000	-	-	0,022	0,007	0,021	-
Other payables	0,332	0,170	0,886	0,872	0,985	0,912	0,888
Total non-interest-bearing debt	**0,920**	**0,755**	**2,168**	**2,161**	**2,296**	**2,167**	**2,305**
Invested capital (Net operating assets	**1,952**	**1,819**	**4,512**	**4,371**	**4,119**	**3,902**	**3,789**
Financial Assets							
Equity							
Total equity	**1,321**	**1,348**	**2,133**	**2,818**	**2,935**	**2,911**	**2,814**
Interest-bearing debt							
Mortagage debt (non-current)	0,594	0,592	0,748	1,013	1,000	0,859	0,858
Credit institutions (non-current)	-	-	1,097	0,859	0,462	-	0,381
Mortgage debt (current)	0,002	0,002	0,014	0,164	0,014	0,005	0,004
Credit institutions (current)	0,054	0,001	0,764	0,008	0,041	0,134	0,416
Interest-bearing debt	**0,649**	**0,594**	**2,623**	**2,044**	**1,517**	**0,998**	**1,660**
Interest-bearing assets							
Cash at bank and in hand	0,019	0,274	0,244	0,491	0,333	0,007	0,685
Interest-bearing assets	**0,019**	**0,274**	**0,244**	**0,491**	**0,333**	**0,007**	**0,685**
Net-interest-bearing debt (NIBD)	**0,631**	**0,321**	**2,379**	**1,553**	**1,184**	**0,991**	**0,975**
Invested Capital	**1,952**	**1,668**	**4,512**	**4,371**	**4,119**	**3,902**	**3,789**

Appendix 8: Heineken – Analytical Income Statement

Analytical Income Statement Heineken

Euro Million	2011	2012	2013	2014	2015	2016	2017
Revenue	17.123	18.383	19.203	19.257	20.511	20.792	21.888
Other income	64	1.510	226	93	411	46	141
Net revenue	**17.187**	**19.893**	**19.429**	**19.350**	**20.922**	**20.838**	**22.029**
COGS	-10.966	-11.849	-12.186	-12.053	-12.931	-13.003	-13.540
Gross Profit	**6.221**	**8.044**	**7.243**	**7.297**	**7.991**	**7.835**	**8.489**
Personnel expenses	-2.838	-3.037	-3.108	-3.080	-3.322	-3.263	-3.550
Share of profit of associates and JV	240	213	146	148	172	150	75
EBITDA	**3.623**	**5.220**	**4.281**	**4.365**	**4.841**	**4.722**	**5.014**
Amortisation, depreciation and impairments	-1.168	-1.316	-1.581	-1.437	-1.594	-1.817	-1.587
EBIT	**2.455**	**3.904**	**2.700**	**2.928**	**3.247**	**2.905**	**3.427**
Income tax expense	-465	-525	-520	-732	-697	-673	-755
Tax shield	-112	-41	-157	-156	-107	-147	-138
NOPAT	**1.878**	**3.338**	**2.023**	**2.040**	**2.443**	**2.085**	**2.534**
Interest income	70	62	47	48	60	60	72
Interest expense	-494	-551	-579	-457	-412	-419	-468
Other net finance income/(expenses)	-6	219	-61	-79	-57	-134	-123
Net financial expences	**-430**	**-270**	**-593**	**-488**	**-409**	**-493**	**-519**
Tax on net financial expences	112	41	157	156	107	147	138
Net financial expences after tax	**-318**	**-229**	**-436**	**-332**	**-302**	**-346**	**-381**
Net earnings	**1.560**	**3.109**	**1.587**	**1.708**	**2.141**	**1.739**	**2.153**

Tax

Euro million	2011	2012	2013	2014	2015	2016	2017
EBT	1785	3421	1961	2292	2666	2262	2833
Income tax expense	-465	-525	-520	-732	-697	-673	755
Effective tax rate	**26,1%**	**15,3%**	**26,5%**	**31,9%**	**26,1%**	**29,8%**	**26,7%**

Appendix 9: Heineken – Analytical Balance Sheet

Analytical Balance Sheet

Euro Million	2011	2012	2013	2014	2015	2016	2017
Operating Assets							
Non-current assets							
Intangible assets	10835	17725	15934	16341	18183	17424	17670
Property, plant and equipment	7860	8792	8454	8718	9552	9232	11117
Investments in asscociates and JV	1764	1950	1883	2033	1985	2166	1841
Other investments and receiveables	1129	1099	762	737	856	1077	1113
Deferred tax assets	474	564	508	661	958	1011	768
Total non-current operating assets	**22062**	**30130**	**27541**	**28490**	**31534**	**30910**	**32509**
Current assets							
Inventories	1352	1596	1512	1634	1702	1618	1814
Trade receivables	2260	2537	2427	2743	2873	3052	3496
Tax reveivables	0	0	0	23	33	47	64
Prepayments	170	232	218	317	343	328	399
Other investments	14	11	11	13	16	0	0
Total current operating assets	**3796**	**4376**	**4168**	**4730**	**4967**	**5045**	**5773**
Total operating assets	**25858**	**34506**	**31709**	**33220**	**36501**	**35955**	**38282**
Non-interest-bearing debt							
Deferred tax liabilities	449	1790	1444	1503	1858	1672	1495
Provisions (Long term)	894	418	367	398	320	302	970
Tax liabilities	160	140	112	3	3	3	0
Trade and other payables	4624	5273	5131	5533	6013	6224	6756
Provisions (Short term)	140	129	171	165	154	154	178
Current tax liabilities	207	305	317	390	379	352	310
Other liabilitites	0	0	0	0	0	0	0
Total non-interest-bearing debt	**6474**	**8055**	**7542**	**7992**	**8727**	**8707**	**9709**
Invested capital (Net operating ass	**19384**	**26451**	**24167**	**25228**	**27774**	**27248**	**28573**
Financial Assets, Liabilities and Equity							
Equity							
Total equity	**10092**	**12762**	**12356**	**13452**	**15070**	**14573**	**14521**
Net-interest-bearing debt (NIBD)							
Borrowings (long term)	8199	11437	9853	9499	10658	10954	12301
Retirement benefit obligations and simil	1174	1632	1202	1443	1289	1420	1289
Bank overdraft and commercial papers	207	191	178	595	542	1669	1265
Loans and borrowings (Short term)	981	1863	2195	1671	1397	1981	1947
Liabilities associated with assets held fo	0	39	11	178	31	17	2
Interest-bearing debt	**10561**	**15162**	**13439**	**13386**	**13917**	**16041**	**16804**
Financial Assets							
Cash and cash equivalents	813	1037	1290	668	824	3035	2442
Assets held for sale	99	124	37	688	123	57	33
Advance to customer	357	312	301	254	266	274	277
Interest-bearing assets	**1269**	**1473**	**1628**	**1610**	**1213**	**3366**	**2752**
Net-interest-bearing debt (NIBD)	**9292**	**13689**	**11811**	**11776**	**12704**	**12675**	**14052**
Invested Capital	**19384**	**26451**	**24167**	**25228**	**27774**	**27248**	**28573**

Appendix 10: AB InBev – Analytical Income Statement

Analytical Income Statement AB Inbev

USD million	2011	2012	2013	2014	2015	2016	2017
Revenue	39.046	39.758	43.195	47.063	43.604	45.517	56.444
Cost of sales	-14.647	-14.460	-15.461	-16.486	-14.998	-15.490	-18.529
Gross Profit	**24.399**	**25.298**	**27.734**	**30.577**	**28.606**	**30.027**	**37.915**
Distribution expenses	-3.201	-3.673	-3.943	-4.430	-4.136	-4.399	-5.673
Sales and marketing expenses	-4.743	-4.858	-5.511	-6.555	-6.455	-7.274	-7.761
Administrative expenses	-1.797	-1.941	-2.261	-2.441	-2.213	-2.443	-3.256
Other operating income/(expenses)	699	689	1.169	1.391	1.036	735	858
Restructuring	-351	-36	-118	-277	-171	-323	-468
Business and asset disposal	78	58	30	157	524	377	-39
Acquisition costs business combinations	-5	-54	-82	-77	-55	-448	-155
Profit from discontinued operations	-	-	-	-	-	48	28
Non recurring items adj. For depreciation	33	33	-	119	82	-	-
Judicial settlement	-	-	-	-	-80	-	-
Share of result of associates	623	624	294	9	10	16	430
EBITDA	**15.735**	**16.140**	**17.312**	**18.473**	**17.148**	**16.316**	**21.879**
Depreciation, Amortisation and impairment	-2.783	-2.783	-2.985	-3.353	-3.153	-3.371	-4.270
Transitory Item (Fair value adjustments)	-	-	6.410	-	-	-	-
Impairment of assets	-	-	-	-	-82	-	-
EBIT	**12.952**	**13.357**	**20.737**	**15.120**	**13.913**	**12.945**	**17.609**
Core EBIT	**12.952**	**13.357**	**14.327**	**15.120**	**13.995**	**12.945**	**17.609**
Income tax expense	-1.856	-1.717	-2.016	-2.499	-2.594	-1.613	-1.920
Tax Shield	-593	-340	-240	-239	-302	-3.188	-1.128
NOPAT	**10.503**	**11.300**	**18.481**	**12.382**	**11.017**	**8.144**	**14.561**
Core NOPAT	**10.503**	**11.300**	**12.071**	**12.382**	**11.099**	**8.144**	**14.561**
Finance cost	-3.035	-2.532	-3.047	-2.797	-2.417	-5.860	-6.192
Finance income	438	344	561	969	1.178	652	378
Non-reccurring net finance costs	-540	-18	283	509	-214	-3.356	-693
Net financial expences	**-3.137**	**-2.206**	**-2.203**	**-1.319**	**-1.453**	**-8.564**	**-6.507**
Tax on net financial expences	593	340	240	239	302	3.188	1.128
Net financial expences after tax	**-2.544**	**-1.866**	**-1.963**	**-1.080**	**-1.151**	**-5.376**	**-5.379**
Adjusted for decimals			**-**	**-**	**-**	**-**	**1**
Net earnings	**7.959**	**9.434**	**16.518**	**11.302**	**9.948**	**2.768**	**9.183**

Tax

USD million	2011	2012	2013	2014	2015	2016	2017
EBT	9815	11151	18534	13801	12460	4333	11075
Income tax expense	-1856	-1717	-2016	-2499	-2594	-1613	-1920
Effective tax rate	**18,9%**	**15,4%**	**10,9%**	**18,1%**	**20,8%**	**37,2%**	**17,3%**

Appendix 11: AB InBev – Analytical Balance Sheet

Analytical Balance Sheet

USD million	2011	2012	2013	2014	2015	2016	2017
Operating Assets							
Non-current assets							
Goodwill	51.302	51.766	69.927	70.758	65.061	135.864	140.940
Intangible assets	23.818	24.371	29.338	29.923	29.677	44.789	45.874
Property, plant and equipment	16.022	16.461	20.889	20.263	18.952	26.219	27.184
Investments in asscociates and JV	6.696	7.090	187	110	212	4.324	5.263
Income tax receiveables	0	0	0	0	0	6	708
Trade and other receiveables	1.339	1.228	1.252	1.769	913	868	834
Deferred tax assets	673	807	1.180	1.058	1.181	1.261	1.216
Total non-current operating assets	**99.850**	**101.723**	**122.773**	**123.881**	**115.996**	**213.331**	**222.019**
Current assets							
Inventories	2.466	2.500	2.950	2.974	2.862	3.889	4.119
Trade and other receivables	4.121	4.023	5.362	6.449	4.451	6.352	6.566
Tax receivables	312	195	332	359	687	1.112	908
Total current operating assets	**6.899**	**6.718**	**8.644**	**9.782**	**8.000**	**11.353**	**11.593**
Total operating assets	**106.749**	**108.441**	**131.417**	**133.663**	**123.996**	**224.684**	**233.612**
Non-interest-bearing debt							
Deferred tax liabilities	11.279	11.168	12.841	12.701	11.961	14.703	13.107
Provisions (Long term)	874	641	532	634	677	1.347	1.515
Trade and other payables	1.548	2.313	3.222	1.070	1.241	1.316	1.462
Trade and other payables	13.337	14.295	16.474	18.922	17.662	23.086	24.762
Income tax payable	0	0	0	0	0	0	732
Provisions (Short term)	241	180	196	165	220	1.199	885
Income tax payable (short term)	499	543	1.105	629	669	3.845	1.558
Total non-interest-bearing debt	**27.778**	**29.140**	**34.370**	**34.121**	**32.430**	**45.496**	**44.021**
Invested capital (Net operating assets)	**78.971**	**79.301**	**97.047**	**99.542**	**91.566**	**179.188**	**189.591**
Financial Assets, Liabilities and Equity							
Equity							
Total equity	**41.044**	**45.441**	**55.308**	**54.257**	**45.719**	**81.425**	**80.220**
Net-interest-bearing debt (NIBD)							
Interest bearing loans and borrowings (long term)	34.598	38.951	41.274	43.630	43.541	113.941	108.949
Employee benefits (long term)	3.440	3.699	2.862	3.050	2.725	3.014	2.993
Bank overdraft	8	0	6	41	13	184	117
Derivatives (long term)	0	0	0	0	315	471	937
Liabilities associated with assets held for sale	0	0	0	0	0	2.174	0
Derivatives (short term)	0	0	0	0	3.980	1.263	1.457
Interest bearing loans and borrowings (Short term)	5.559	5.390	7.846	7.451	5.912	8.618	7.433
Interest-bearing debt	**43.605**	**48.040**	**51.988**	**54.172**	**56.486**	**129.665**	**121.886**
Financial Assets							
Investments in securities (long term)	244	256	193	118	48	82	100
Employee benefits (Long term)	10	12	10	10	2	10	22
Devivatives (Long term)	0	0	0	0	295	146	25
Derivatives (Short term)	0	0	0	0	3.268	971	458
Investment in securities (short term)	103	6.827	123	301	55	5.659	1.304
Cash and cash equivalents	5.320	7.051	9.839	8.357	6.923	8.579	10.472
Assets held for sale	1	34	84	101	48	16.458	133
Interest-bearing assets	**5.678**	**14.180**	**10.249**	**8.887**	**10.639**	**31.905**	**12.514**
Net-interest-bearing debt (NIBD)	**37.927**	**33.860**	**41.739**	**45.285**	**45.847**	**97.760**	**109.372**
Invested Capital	**78.971**	**79.301**	**97.047**	**99.542**	**91.566**	**179.185**	**189.592**

Appendix 12: Key Financials Peer Group – Income Statement

Key Financials - Income Statement

	Million	2011	2012	2013	2014	2015	2016	2017
Carlsberg	Net revenue	63,561	67,201	66,552	64,506	65,354	62,614	61,808
	EBITDA	14,353	12,757	13,887	13,136	12,822	14,571	13,814
	EBITDA %	22,58 %	18,98 %	20,87 %	20,36 %	19,62 %	23,27 %	22,35 %
	D, M & I %	-6,02 %	-6,89 %	-6,54 %	-7,64 %	-10,83 %	-9,53 %	-7,43 %
	Core EBIT	10,526	8,124	9,536	8,210	5,742	8,603	9,219
	Adjusted EBIT %	16,56 %	12,09 %	14,33 %	12,73 %	8,79 %	13,74 %	14,92 %
	Core NOPAT	7,846	6,151	7,029	5,899	5,465	5,693	7,327
	Adjusted NOPAT %	12,34 %	9,15 %	10,56 %	9,15 %	8,36 %	9,09 %	11,85 %
	Net Earnings	6,418	4,833	5,911	5,048	-2,582	4,857	2,065
Royal Unibrew	Net revenue	3,431	3,430	4,481	6,056	6,032	6,340	6,384
	EBITDA	0,596	0,609	0,732	1,130	1,225	1,306	1,362
	EBITDA %	17,38 %	17,76 %	16,33 %	18,66 %	20,31 %	20,59 %	21,33 %
	D, M & I %	-3,55 %	-3,62 %	-3,83 %	-5,02 %	-5,11 %	-4,81 %	-4,59 %
	EBIT	0,474	0,485	0,560	0,826	0,917	1,001	1,069
	EBIT %	13,82 %	14,14 %	12,50 %	13,64 %	15,20 %	15,78 %	16,74 %
	NOPAT	0,357	0,368	0,486	0,636	0,716	0,780	0,837
	NOPAT %	10,42 %	10,73 %	10,84 %	10,51 %	11,88 %	12,31 %	13,11 %
	Net Earnings	0,351	0,373	0,480	0,624	0,711	0,784	0,831
Heineken	Net revenue	17187	19893	19429	19350	20922	20838	22029
	EBITDA	3623	5220	4281	4365	4841	4722	5014
	EBITDA %	21,08 %	26,24 %	22,03 %	22,56 %	23,14 %	22,66 %	22,76 %
	D, M & I %	-6,8 %	-6,6 %	-8,1 %	-7,4 %	-7,6 %	-8,7 %	-7,2 %
	EBIT	2455	3904	2700	2928	3247	2905	3427
	EBIT %	14,28 %	19,62 %	13,90 %	15,13 %	15,52 %	13,94 %	15,56 %
	NOPAT	1878	3338	2023	2040	2443	2085	2534
	NOPAT %	10,93 %	16,78 %	10,41 %	10,54 %	11,68 %	10,01 %	11,50 %
	Net Earnings	1560	3109	1587	1708	2141	1739	2153
AB InBev	Net revenue	39046	39758	43195	47063	43604	45517	56444
	EBITDA	15735	16140	17312	18473	17148	16316	21879
	EBITDA %	40,30 %	40,60 %	40,08 %	39,25 %	39,33 %	35,85 %	38,76 %
	D, M & I %	-7,13 %	-7,00 %	-6,91 %	-7,12 %	-7,42 %	-7,41 %	-7,57 %
	Core EBIT	12952	13357	14327	15120	13995	12945	17609
	Adjusted EBIT %	33,17 %	33,60 %	33,17 %	32,13 %	32,10 %	28,44 %	31,20 %
	Core NOPAT	10503	11300	12071	12382	11099	8144	15245
	Adjusted NOPAT %	26,90 %	28,42 %	27,95 %	26,31 %	25,45 %	17,89 %	27,01 %
	Net Earnings	7959	9434	16518	11302	9948	2768	9183

Appendix 13: Key Financials Peer Group – Balance Sheet

Key Financials - Balance Sheet

	Million	2011	2012	2013	2014	2015	2016	2017
Carlsberg	Total Assets	132,717	136,036	135,64	122,491	121,301	123,279	110,789
	Non-interest bearing Debt	34,858	35,264	0,147	35,055	36,319	38,159	37,186
	Total Equity	61,335	62,918	60,751	45,388	47,231	53,650	49,525
	NIBD	36,524	37,854	39,325	42,048	37,751	31,470	24,078
	Invested Capital	97,859	100,772	100,076	87,436	84,982	85,120	73,603
Royal Unibrew	Total Assets	2,872	2,574	6,681	6,532	6,414	6,069	6,094
	Non-interest bearing Debt	0,920	0,755	2,168	2,161	2,296	2,167	2,305
	Total Equity	1,321	1,348	2,133	2,818	2,935	2,911	2,814
	NIBD	0,631	0,321	2,379	1,553	1,184	0,991	0,975
	Invested Capital	1,952	1,668	4,512	4,371	4,119	3,902	3,789
Heineken	Total Assets	25858	34506	31709	33220	36501	35955	38282
	Non-interest bearing Debt	6474	8055	7542	7992	8727	8707	9709
	Total Equity	10092	12762	12356	13452	15070	14573	14521
	NIBD	9292	13689	11811	11776	12704	12675	14052
	Invested Capital	19384	26451	24167	25228	27774	27248	28573
Ab Inbev	Total Assets	106749	108441	131417	133663	123996	224684	233612
	Non-interest bearing Debt	27778	29140	34370	34121	32430	45496	44021
	Total Equity	41044	45441	55308	54257	45719	81425	80220
	NIBD	37927	33860	41739	45285	45847	97760	109372
	Invested Capital	78971	79301	97047	99542	91566	179185	189592

Appendix 14: Key Financials Peer Group – Profitability Ratios

Key Financials - Profitability

		2011	2012	2013	2014	2015	2016	2017
Carlsberg	Profit Margin before tax	16,56%	12,09%	14,33%	12,73%	8,79%	13,74%	14,92%
	Profit Margin after tax	12,34%	9,15%	10,56%	9,15%	8,36%	9,09%	11,85%
	Turnover rate IC	0,65	0,67	0,67	0,74	0,77	0,74	0,84
	Turnover rate IC days	554	540	541	488	468	489	429
	ROIC before tax	10,76%	8,06%	9,53%	9,39%	6,76%	10,11%	12,53%
	ROIC after tax	8,02%	6,10%	7,02%	6,75%	6,43%	6,69%	9,95%
	ROE	10,46%	7,68%	9,73%	11,12%	-5,47%	9,05%	4,17%
	ROE (ROIC formula)	10,46%	7,68%	9,73%	11,12%	6,74%	9,05%	13,86%
	ROA	5,91%	4,52%	5,18%	4,82%	-0,25%	4,62%	2,28%
	Net borrowing cost (NBC)	-3,91%	-3,48%	-2,84%	-2,02%	-6,04%	-2,65%	-1,92%
Royal Unibrew	Profit Margin before tax	13,82%	14,14%	12,50%	13,64%	15,20%	15,78%	16,74%
	Profit Margin after tax	10,42%	10,73%	10,84%	10,51%	11,88%	12,31%	13,11%
	Turnover rate IC	1,76	2,06	0,99	1,39	1,46	1,62	1,68
	Turnover rate IC days	205	175	363	260	246	222	214
	ROIC before tax	24,30%	29,07%	12,41%	18,90%	22,26%	25,64%	28,20%
	ROIC after tax	18,31%	22,07%	10,76%	14,56%	17,39%	19,99%	22,09%
	ROE	26,56%	27,66%	22,48%	22,15%	24,24%	26,92%	29,52%
	ROA	12,45%	14,30%	7,27%	9,74%	11,17%	12,86%	13,73%
	Net borrowing cost (NBC)	-1,04%	1,44%	-0,26%	-0,79%	-0,42%	0,36%	-0,65%
Heineken	Profit Margin before tax	14,28%	19,62%	13,90%	15,13%	15,52%	13,94%	15,56%
	Profit Margin after tax	10,93%	16,78%	10,41%	10,54%	11,68%	10,01%	11,50%
	Turnover rate IC	0,89	0,75	0,80	0,77	0,75	0,76	0,77
	Turnover rate IC days	406	479	448	469	478	471	467
	ROIC before tax	12,67%	14,76%	11,17%	11,61%	11,69%	10,66%	11,99%
	ROIC after tax	9,69%	12,62%	8,37%	8,09%	8,80%	7,65%	8,87%
	ROE	15,46%	24,36%	12,84%	12,70%	14,21%	11,93%	14,83%
	ROA	7,26%	9,67%	6,38%	6,14%	6,69%	5,80%	6,62%
	Net borrowing cost (NBC)	-3,42%	-1,67%	-3,69%	-2,82%	-2,38%	-2,73%	-2,71%
AB InBev	Profit Margin before tax	33,17%	33,60%	33,17%	32,13%	32,10%	28,44%	31,20%
	Profit Margin after tax	26,90%	28,42%	27,95%	26,31%	25,45%	17,89%	27,01%
	Turnover rate IC	0,49	0,50	0,45	0,47	0,48	0,25	0,30
	Turnover rate IC days	728	718	809	761	756	1417	1209
	ROIC before tax	16,40 %	16,84 %	14,76 %	15,19 %	15,28 %	7,22 %	9,29 %
	ROIC after tax	13,30 %	14,25 %	12,44 %	12,44 %	12,12 %	4,54 %	8,04 %
	ROE	19,39 %	20,76 %	29,87 %	20,83 %	21,76 %	3,40 %	11,45 %
	ROE (ROIC formula)	19,39 %	20,76 %	18,28 %	20,83 %	21,76 %	3,40 %	11,45 %
	ROA	9,84 %	10,42 %	9,19 %	9,26 %	8,95 %	3,62 %	6,53 %
	Net borrowing cost (NBC)	-6,71 %	-5,51 %	-4,70 %	-2,39 %	-2,51 %	-5,50 %	-5,54 %

Appendix 15: Key Financials Peer Group – Liquidity Ratios

Key Financials - Liquidity

		2011	2012	2013	2014	2015	2016	2017
Carlsberg	**Short term**							
	Current ratio	0,74	0,79	0,61	0,71	0,56	0,49	0,61
	Quick ratio	0,51	0,47	0,51	0,48	0,38	0,37	0,33
	NWC Turnover	-9,17	-11,87	-4,99	-8,28	-5,00	-3,62	-6,30
	Long-trem							
	Financial leverage	0,60	0,60	0,65	0,93	0,80	0,59	0,49
	Solvency ratio	0,45	0,44	0,44	0,36	0,38	0,42	0,43
	Spread	4,11%	2,62%	4,18%	4,72%	0,39%	4,03%	8,04%
	Interest coverage ratio	5,52	4,68	6,31	7,02	3,75	6,90	11,70
Royal Unibrew	**Short term**							
	Current ratio	0,76	1,13	0,45	0,72	0,63	0,46	0,71
	Quick ratio	0,56	0,53	0,32	0,33	0,31	0,31	0,33
	NWC Turnover	-18,44	33,90	-3,30	-11,71	-8,39	-6,13	-9,44
	Long-trem							
	Financial leverage	0,48	0,24	1,12	0,55	0,40	0,34	0,35
	Solvency ratio	0,46	0,47	0,31	0,40	0,43	0,48	0,42
	Spread	17,27%	23,51%	10,51%	13,77%	16,97%	20,35%	21,44%
	Interest coverage ratio	17,24	12,68	12,35	13,67	20,06	32,38	34,03
Heineken	**Short term**							
	Current ratio	0,75	0,70	0,68	0,65	0,68	0,78	0,79
	Quick ratio	0,49	0,49	0,47	0,51	0,50	0,51	0,55
	NWC Turnover	-11,09	-8,47	-7,67	-6,55	-7,77	-9,06	-9,83
	Long-trem							
	Financial leverage	0,92	1,07	0,96	0,88	0,84	0,87	0,97
	Solvency ratio	0,37	0,35	0,37	0,39	0,40	0,37	0,35
	Spread	6,27%	10,95%	4,68%	5,27%	6,42%	4,92%	6,16%
	Interest coverage ratio	5,71	14,46	4,55	6,00	7,94	5,89	6,60
Ab Inbev	**Short term**							
	Current ratio	0,63	1,01	0,73	0,68	0,64	1,07	0,66
	Quick ratio	0,32	0,30	0,34	0,47	0,37	0,43	0,44
	NWC Turnover	-5,33	179,09	-6,23	-5,43	-4,29	17,19	-4,61
	Long-trem							
	Financial leverage	0,92	0,75	0,75	0,83	1,00	1,20	1,36
	Solvency ratio	0,37	0,37	0,39	0,38	0,34	0,32	0,33
	Spread	6,59 %	8,74 %	7,73 %	10,05 %	9,61 %	-0,95 %	2,50 %
	Interest coverage ratio	4,13	6,05	6,50	11,46	9,63	1,51	2,71

Appendix 16: Key Financials Peer Group – Growth Ratios

Key Financials - Growth in key ratios

	Million	2011	2012	2013	2014	2015	2016	2017	Average
Carlsberg	Net revenue	61,808	5,73%	-0,97%	-3,07%	1,31%	-4,19%	-1,29%	-0,41%
	EBITDA	14,353	-11,12%	8,86%	-5,41%	-2,39%	13,64%	-5,20%	-0,27%
	EBIT	10,526	-22,82%	17,38%	-13,91%	-30,06%	49,83%	7,16%	1,26%
	NOPAT	7,846	-21,60%	14,27%	-16,08%	-7,36%	4,17%	28,70%	0,35%
	Net earnings	6,418	-24,70%	22,30%	-14,60%	-151,15%	288,10%	-57,64%	10,39%
	Invested Capital	97,859	2,98%	-0,69%	-12,63%	-2,81%	0,16%	-13,53%	-4,42%
	Total Equity	61,335	2,58%	-3,44%	-25,29%	4,06%	13,59%	-7,69%	-2,70%
	Sustainable Growth rate	-	8,81%	6,08%	7,52%	7,15%	4,39%	5,71%	6,61%
Royal Unibrew	Net revenue	3,431	-0,02%	30,61%	35,04%	-0,33%	5,14%	0,63%	11,85%
	EBITDA	0,596	1,69%	21,67%	53,40%	8,90%	6,50%	4,62%	16,13%
	EBIT	0,474	2,00%	1,60%	46,43%	10,00%	9,89%	6,00%	12,65%
	NOPAT	0,357	2,86%	33,33%	31,25%	12,70%	9,80%	6,00%	15,99%
	Net earnings	0,351	5,71%	27,03%	31,91%	14,52%	9,86%	6,41%	15,91%
	Invested Capital	1,952	-14,46%	170,30%	3,10%	-5,77%	-5,29%	-2,85%	24,17%
	Total Equity	1,321	1,90%	58,35%	32,10%	4,15%	0,82%	-3,33%	15,67%
	Sustainable Growth Rate	-	7,17%	48,30%	6,62%	8,85%	10,20%	11,90%	15,51%
Heineken	Net revenue	17,187	15,74%	-2,33%	-0,41%	8,12%	-0,40%	5,72%	4,41%
	EBITDA	3,623	44,08%	-17,99%	1,96%	10,90%	-2,46%	6,18%	7,11%
	EBIT	2,455	58,80%	-30,77%	8,52%	10,96%	-10,53%	17,97%	9,16%
	NOPAT	1,877	78,60%	-39,52%	0,90%	19,60%	-14,75%	21,78%	11,10%
	Net earnings	1,560	98,70%	-49,00%	7,10%	25,88%	-18,69%	23,60%	14,60%
	Invested Capital	19,384	36,46%	-7,64%	4,39%	10,09%	-1,89%	4,86%	7,71%
	Total Equity	10,092	26,46%	-3,18%	8,87%	12,03%	-3,30%	-0,36%	6,75%
	Sustainable Growth rate	-	11,36%	15,63%	7,99%	7,99%	9,14%	7,78%	9,98%
AB InBev	Net revenue	39,046	1,82%	8,64%	8,95%	-7,35%	4,39%	24,01%	6,74%
	EBITDA	15,735	2,57%	7,26%	6,71%	-7,17%	-4,85%	34,10%	6,44%
	EBIT	12,952	3,13%	7,26%	5,54%	-7,98%	-6,96%	36,03%	6,17%
	NOPAT	10,502	7,60%	12,99%	-3,02%	-11,03%	-26,08%	87,22%	11,28%
	Net earnings	7,959	18,53%	75,09%	-31,58%	-12,71%	-71,94%	231,76%	34,86%
	Invested Capital	78,971	0,42%	22,38%	2,57%	-8,01%	95,69%	5,81%	19,81%
	Total Equity	41,044	10,71%	21,79%	-1,90%	-15,74%	78,10%	-1,48%	15,25%
	Sustainable Growth rate	-	15,12%	17,09%	15,12%	18,24%	22,95%	2,79%	15,22%

Appendix 17: VRIO Analysis

Resources	Valuable	Rare	Imperfectly imitable	Operational exploited	Level of competitive advantage.
Produce locally in some markets	Yes, Local market knowledge creates value	Partially. Other breweries also have local productions within markets, but not in the Baltic countries as Carlsberg.	No, Other large beer companies can acquire minor companies in the desired markets.	Yes. Carlsberg are focussing local production and sourcing rather than exporting.	CCA
Large market shares in Baltic countries.	Yes, it create more revenue	Yes, no other competitor has the same market share as Carlsberg within the beer market.	Close to yes, It is difficult to imitate it, since it would cost a significantly to acquire the same market share as Carlsberg within the Baltic countries. Building an organic presence takes time.	Yes. Carlsberg has been investing heavily in this area and has optimised the company's operations there.	SCA
No currency risk in EU.	Yes, Less external risk creates value	Partially, It is rare outside of EU.	Partially. It will take investments in EU markets, both in sales and production, which can be difficult for a company outside of EU.	Partially, Carlsberg does exploid the resource, but stil focuses much more on markets.	CCA
Diverse product portfolio	Yes, more products to fit the consumer's preferences	Partially, some competitors have large product portfolios.	Yes, since many of the products and brands they cannot be imitated.	Yes, Carlsberg sells all products and optimizes the portfolio	SCA
Technology in products, production and logistics	Yes, can innovate, improve and optimise, which creates value.	Yes, only a few companies has the age and has acquired this amount of knowledge.	Yes, it is difficult to imitate or recreate the same knowledge acquired by Carlsberg.	Yes, Carlsberg is using it in everyday production.	SCA
Brand image	Yes, better branding can increase sales and create value.	Yes, Carslberg has a strong brand. An is now using the Danish heritage to diversify.	Yes, It is difficult to imitate the brand specifically	Yes, Carlsberg is using it in all aspects of the company.	SCA

In housed logistics channels	Yes, better control over logistics creates value.	Partially, not many companies have an in-house logistics system, but all companies in the peer group have.	Partially, it is not difficult to do inhouse logistics, but it requires significant investments.	Yes, Carlsberg utilises the potential	CCA
Global presence	Yes, creates more brand awareness in all markets	No, many brewing companies are globally present today.	Yes, it is difficult to imitate the exact same presence as Carlsberg, since it would require competing on the same markets.	Yes, global presence is key for Carlsberg products.	CCA
Invest and maintain close relationships with suppliers (CSC)	Yes, can decrease risk and costs, which creates value	Partially, only a few companies have the capability to invest in their suppliers.	Partially, Major brewing companies invest in suppliers or acquire them to minimise risk and costs.	Yes, cutting costs and using it for CSR strategy.	CCA
Strategic implementations to diminish waste, water and energy.	Yes, cuts costs and increase CSR for branding, which creates value	No, almost all companies has a CSR report and is focusing on it.	No, optimising costs within production is an internal process, which can be imitated.	Yes, Carlsberg is utilizing it through out its organization.	PA
Flexibility company – Sail 22 seems to work.	Yes, a flexible structure creates value	Yes. Amongst the peer group there has not been seen a turn around such as Sail 22	Yes, if the organization is not agile and is ready for changes it is difficult to imitate.	Yes, proved by the Sail 22 strategy.	SCA

Appendix 18: Carlsberg – Forecast Drivers

Financial Value Drivers	Historical Value divers							Forecast Value Drivers				
	2011	2012	2013	2014	2015	2016	2017	2018E	2019E	2020E	2021E	2022E
Volume growth	3,19%	1,15%	-0,07%	3,06%	-1,41%	-2,16%	-4,13%					
Growth drivers Carlsberg												
Organic growth	6%	3%	1%	2%	2%	2%	1%					
Revenue growth	**5,84%**	**5,73%**	**-0,97%**	**-3,07%**	**1,31%**	**-4,19%**	**-1,29%**	**0,49%**	**0,97%**	**1,46%**	**1,94%**	**2,43%**
Cost drivers (margins)												
Cost of sales % of revenue	45,91%	46,23%	46,22%	46,25%	46,43%	44,60%	43,78%	43,53%	43,27%	43,01%	42,76%	42,50%
Sales and distribution % of revenue	27,92%	28,01%	26,93%	27,81%	27,99%	27,85%	27,71%	27,74%	27,74%	27,74%	27,74%	27,74%
Administration % of revenue	5,95%	5,98%	6,22%	6,42%	6,29%	7,61%	7,14%	7,01%	6,88%	6,76%	6,63%	6,50%
Other income and expenses % of revenue	0,56%	0,37%	0,19%	0,69%	0,36%	0,32%	0,18%	0,38%	0,38%	0,38%	0,38%	0,38%
Income before tax from asociates % of revenue	0,27%	0,17%	0,16%	0,63%	0,56%	0,52%	0,42%	0,39%	0,39%	0,39%	0,39%	0,39%
Operating profit before special items	**21,12%**	**20,36%**	**21,02%**	**21,01%**	**20,49%**	**20,94%**	**22,15%**	**22,49%**	**22,87%**	**23,26%**	**23,64%**	**24,03%**
Special items	1,46%	-1,37%	-0,16%	-0,65%	-0,87%	2,33%	0,20%	-0,13%	-0,13%	-0,13%	-0,13%	-0,13%
EBITDA margin	**22,58%**	**18,98%**	**20,87%**	**20,36%**	**19,62%**	**23,27%**	**22,35%**	**22,35%**	**22,74%**	**23,12%**	**23,51%**	**23,89%**
Depreciation as a % of PPE	12,39%	14,93%	13,39%	17,26%	26,54%	23,12%	18,89%	18,19%	17,48%	16,78%	16,07%	15,37%
Core EBIT margin	**16,56%**	**12,09%**	**14,33%**	**12,73%**	**8,79%**	**13,74%**	**14,92%**	**15,19%**	**15,86%**	**16,52%**	**17,18%**	**17,84%**
Tax rate	25,15%	24,03%	26,08%	27,17%	-48,99%	33,00%	41,39%	27,09%	27,09%	27,09%	27,09%	27,09%
NOPAT margin	**12,34%**	**9,15%**	**10,56%**	**9,15%**	**8,36%**	**9,09%**	**11,85%**	**11,08%**	**11,56%**	**12,04%**	**12,53%**	**13,01%**
Investment drivers												
Intangible assets as a % of revenue	122,46%	119,06%	121,22%	109,35%	111,58%	122,55%	109,68%	111,06%	112,43%	113,81%	115,18%	116,56%
Property, plant and equipment as a % of revenue	48,60%	46,18%	48,84%	44,25%	40,82%	41,22%	39,36%	39,36%	39,36%	39,36%	39,36%	39,36%
Investments in associates and JV as a % of revenue	7,88%	8,58%	2,82%	5,86%	7,15%	7,51%	6,90%	6,67%	6,67%	6,67%	6,67%	6,67%
Other non-current assets	3,96%	4,86%	4,81%	5,26%	5,43%	4,28%	4,23%	4,69%	4,69%	4,69%	4,69%	4,69%
Non-current assets as a % of revenue	**182,90%**	**178,69%**	**177,70%**	**164,72%**	**164,99%**	**175,56%**	**160,17%**	**161,78%**	**163,15%**	**164,53%**	**165,90%**	**167,28%**
NWC decomposed into:												
Inventories as a % of revenue	6,84%	6,76%	7,16%	6,97%	5,84%	6,33%	6,20%	6,19%	6,17%	6,16%	6,14%	6,12%
Trade receivables as a % of revenue	12,38%	11,71%	11,87%	10,66%	8,77%	8,76%	7,46%	7,46%	7,46%	7,46%	7,46%	7,46%
Other current assets as a % of revnue	6,68%	5,27%	7,09%	7,53%	6,01%	6,23%	5,41%	6,32%	6,32%	6,32%	6,32%	6,32%
Deffered tax liabilities as a % of revnue	13,96%	13,29%	12,28%	9,99%	9,06%	9,98%	9,06%	9,37%	9,37%	9,37%	9,37%	9,37%
Trade payables as a % of revenue	17,37%	17,72%	19,46%	18,66%	18,76%	21,56%	21,80%	21,80%	21,80%	21,80%	21,80%	21,80%
Other liabilities as a % of revenue	23,52%	21,47%	21,69%	25,70%	27,75%	29,41%	29,30%	28,55%	27,80%	27,05%	26,30%	25,55%
NWC as a % of revenue	**-28,94%**	**-28,73%**	**-27,32%**	**-29,18%**	**-34,95%**	**-39,62%**	**-41,09%**	**-39,75%**	**-39,02%**	**-38,28%**	**-37,55%**	**-36,81%**
Financial divers												
NIBD as a % of invested capital	37,32%	37,56%	39,30%	48,09%	44,42%	36,97%	32,71%	30,57%	28,18%	26,02%	24,11%	22,45%
Net financial expenses as a % of NIBD	-5,2%	-4,6%	-3,8%	-2,8%	-4,1%	-4,0%	-3,3%	-3,96%	-3,96%	-3,96%	-3,96%	-3,96%

Appendix 19: Carlsberg – Pro Forma Income Statement

Pro forma Income Statement Carlsberg	Historical	Forecasted				
DKK million	**2017**	**2018E**	**2019E**	**2020E**	**2021E**	**2022E**
Net revenue	**61,808**	**62,108**	**62,712**	**63,625**	**64,861**	**66,437**
Cost of Sales	-27,062	-27,034	-27,136	-27,368	-27,733	-28,236
Gross Profit	**34,746**	**35,074**	**35,576**	**36,258**	**37,129**	**38,201**
Sales and distribution expenses	-17,125	-17,232	-17,399	-17,653	-17,995	-18,433
Administrative expenses	-4,413	-4,355	-4,317	-4,298	-4,299	-4,318
Other operating activites, net	0,113	0,237	0,239	0,243	0,247	0,253
Share profit after tax of associates and joint ventures	0,262	0,242	0,244	0,247	0,252	0,258
Operating profit before special items	**13,691**	**13,966**	**14,343**	**14,797**	**15,334**	**15,962**
Special items, net	0,123	-0,084	-0,085	-0,086	-0,087	-0,090
EBITDA	**13,814**	**13,882**	**14,258**	**14,711**	**15,246**	**15,872**
Depriciation, amortisation and impairment losses	-4,595	-4,445	-4,315	-4,201	-4,103	-4,019
EBIT	**9,219**	**9,437**	**9,944**	**10,510**	**11,143**	**11,854**
Corporate tax	-1,458	-2,556	-2,693	-2,847	-3,018	-3,211
NOPAT	**7,327**	**6,881**	**7,250**	**7,663**	**8,125**	**8,643**
Net financial expences before tax	-0,788	-0,954	-0,918	-0,869	-0,828	-0,795
Tax on net financial expenses	0,326	0,258	0,249	0,235	0,224	0,215
Net financial expences	**-0,462**	**-0,695**	**-0,669**	**-0,634**	**-0,604**	**-0,580**
Net earnings	**2,065**	**6,186**	**6,581**	**7,030**	**7,521**	**8,063**

Appendix 20: Carlsberg – Pro Forma Cash Flow Statement

Cash flow statement	Historical	Forecasted				
DKK million	**2017**	**2018E**	**2019E**	**2020E**	**2021E**	**2022E**
NOPAT	**7,327**	**6,881**	**7,250**	**7,663**	**8,125**	**8,643**
Depriciation, amortisation and impairment losses	4,595	4,445	4,315	4,201	4,103	4,019
Changes in inventories	0,129	-0,009	-0,027	-0,046	-0,066	-0,086
Changes in trade receivables	0,874	-0,022	-0,045	-0,068	-0,092	-0,118
Changes in other current assets	0,558	-0,579	-0,038	-0,058	-0,078	-0,100
Changes in deferred tax liabilities	-0,649	0,218	0,057	0,086	0,116	0,148
Changes in trade payables	-0,023	0,065	0,132	0,199	0,269	0,343
Changes in other operating liabilities	-0,301	-0,378	-0,299	-0,224	-0,153	-0,085
Cash flow from operations	**12,510**	**10,621**	**11,344**	**11,753**	**12,225**	**12,765**
Investments, non-current assets	-3,954	-5,924	-6,153	-6,567	-7,029	-7,545
Free cash flow to the firm	**8,556**	**4,697**	**5,191**	**5,186**	**5,196**	**5,219**
Net financial expenses	-0,462	-0,695	-0,669	-0,634	-0,604	-0,580
Dividends (50% payout)	-0,702	-3,093	-3,291	-3,515	-3,761	-4,032
Free cash flow to equity holders	**7,392**	**0,909**	**1,231**	**1,038**	**0,832**	**0,608**
Cash surplus	**-7,392**	**-0,909**	**-1,231**	**-1,038**	**-0,832**	**-0,608**

Appendix 21: Carlsberg – Pro Forma Balance Sheet

Pro forma balance sheet	Historical	Forecasted				
DKK million	2017	2018E	2019E	2020E	2021E	2022E
Operating Assets						
Non-current assets						
Intangible assets	67,793	68,976	70,508	72,410	74,709	77,437
Property, plant and equipment	24,325	24,443	24,681	25,040	25,527	26,147
Investments	4,266	4,144	4,184	4,245	4,328	4,433
Other non-current assets	2,615	2,914	2,943	2,986	3,044	3,117
Total non-current assets	**98,999**	**100,478**	**102,316**	**104,682**	**107,607**	**111,134**
Current assets						
Inventories	3,834	3,843	3,870	3,917	3,983	4,069
Trade receivables	4,611	4,633	4,678	4,747	4,839	4,956
Other current assets	3,345	3,924	3,962	4,020	4,098	4,198
Total current assets	**11,790**	**12,401**	**12,511**	**12,683**	**12,920**	**13,223**
Total assets	**110,789**	**112,878**	**114,827**	**117,365**	**120,527**	**124,357**
Non-interest-bearing debt						
Deferred tax liabilities	5,601	5,819	5,876	5,961	6,077	6,225
Trade payables	13,474	13,539	13,671	13,870	14,140	14,483
Other operating liabilities	18,111	17,733	17,434	17,210	17,058	16,973
Total non-interest-bearing debt	**37,186**	**37,091**	**36,981**	**37,042**	**37,275**	**37,681**
Invested capital (NOA)	**73,603**	**75,787**	**77,846**	**80,323**	**83,252**	**86,676**
Financial Assets						
Equity						
Total equity begin		49,525	52,618	55,909	59,423	63,184
Profit after tax		6,186	6,581	7,030	7,521	8,063
Dividends (50% payout)		-3,093	-3,291	-3,515	-3,761	-4,032
Total equity end	**49,525**	**52,618**	**55,909**	**59,423**	**63,184**	**67,216**
Net-interest-bearing debt (NIBD)	**24,078**	**23,169**	**21,938**	**20,900**	**20,068**	**19,460**
Invested Capital	**73,603**	**75,787**	**77,846**	**80,323**	**83,252**	**86,676**

Appendix 22: Carlsberg – Average Risk Free Rate

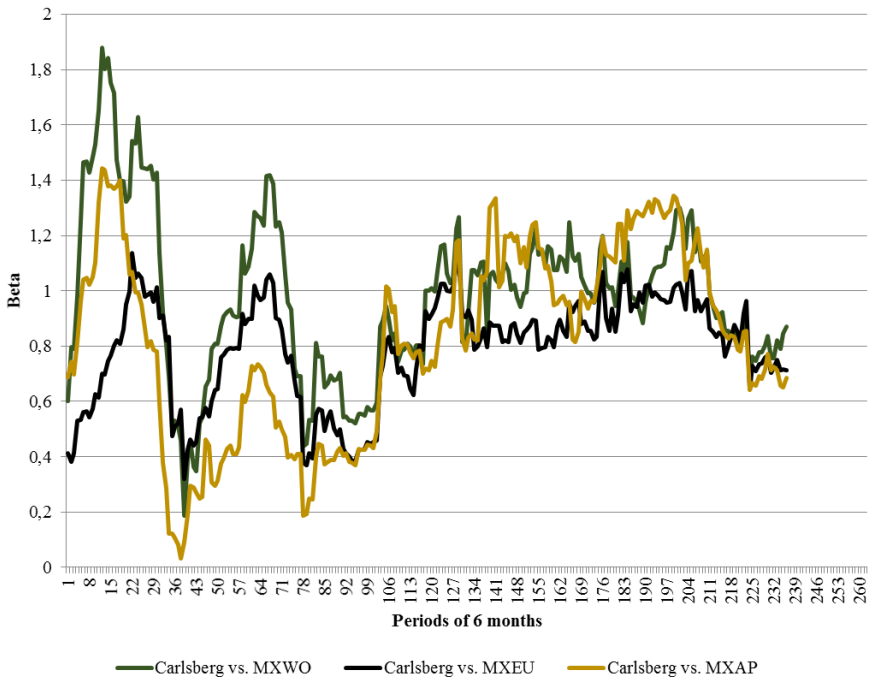
Avg. Risk free rate in percentage 3,22 %

Risk free rate in percentage

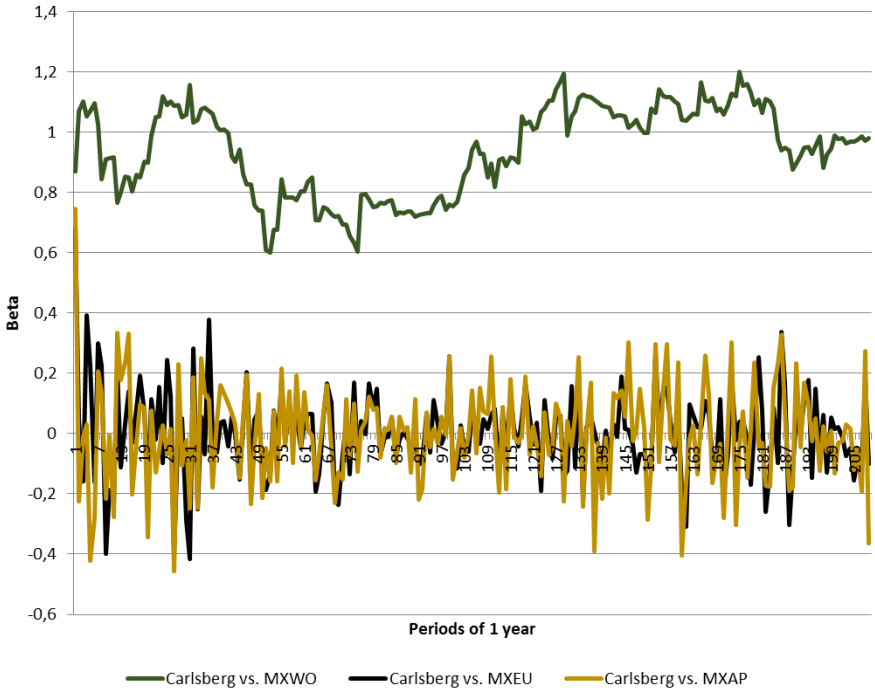
1998M01	5,51	2001M12	5,15	2005M11	3,43	2009M10	3,65	2013M09	1,95	2017M08	0,19
1998M02	5,33	2002M01	5,16	2005M12	3,3	2009M11	3,53	2013M10	1,75	2017M09	0,23
1998M03	5,25	2002M02	5,17	2006M01	3,45	2009M12	3,62	2013M11	1,74	2017M10	0,17
1998M04	5,35	2002M03	5,44	2006M02	3,54	2010M01	3,54	2013M12	1,99	2017M11	0,14
1998M05	5,18	2002M04	5,36	2006M03	3,84	2010M02	3,42	2014M01	1,71	2017M12	0,23
1998M06	5,05	2002M05	5,37	2006M04	4,07	2010M03	3,37	2014M02	1,63		
1998M07	5,02	2002M06	5,19	2006M05	3,97	2010M04	3,21	2014M03	1,62		
1998M08	4,93	2002M07	5,05	2006M06	4,13	2010M05	2,69	2014M04	1,57		
1998M09	4,71	2002M08	4,91	2006M07	3,98	2010M06	2,68	2014M05	1,39		
1998M10	4,8	2002M09	4,63	2006M08	3,8	2010M07	2,76	2014M06	1,29		
1998M11	4,49	2002M10	4,86	2006M09	3,67	2010M08	2,17	2014M07	1,2		
1998M12	4,35	2002M11	4,81	2006M10	3,71	2010M09	2,37	2014M08	0,91		
1999M01	4,05	2002M12	4,45	2006M11	3,67	2010M10	2,63	2014M09	0,92		
1999M02	4,42	2003M01	4,29	2006M12	3,89	2010M11	2,85	2014M10	0,83		
1999M03	4,37	2003M02	4,17	2007M01	4,04	2010M12	3,02	2014M11	0,64		
1999M04	4,25	2003M03	4,32	2007M02	3,92	2011M01	3,17	2014M12	0,56		
1999M05	4,56	2003M04	4,37	2007M03	4,03	2011M02	3,21	2015M01	0,2		
1999M06	4,93	2003M05	3,89	2007M04	4,19	2011M03	3,39	2015M02	0,12		
1999M07	5,22	2003M06	4,03	2007M05	4,43	2011M04	3,27	2015M03	0,15		
1999M08	5,41	2003M07	4,27	2007M06	4,58	2011M05	3,03	2015M04	0,26		
1999M09	5,62	2003M08	4,39	2007M07	4,39	2011M06	3	2015M05	0,41		
1999M10	5,63	2003M09	4,22	2007M08	4,31	2011M07	2,8	2015M06	0,73		
1999M11	5,57	2003M10	4,51	2007M09	4,38	2011M08	2,35	2015M07	0,58		
1999M12	5,64	2003M11	4,62	2007M10	4,26	2011M09	2,06	2015M08	0,66		
2000M01	5,91	2003M12	4,46	2007M11	4,12	2011M10	2,33	2015M09	0,56		
2000M02	5,82	2004M01	4,41	2007M12	4,38	2011M11	2,04	2015M10	0,81		
2000M03	5,57	2004M02	4,22	2008M01	3,94	2011M12	1,58	2015M11	0,71		
2000M04	5,68	2004M03	4,1	2008M02	3,88	2012M01	1,75	2015M12	0,92		
2000M05	5,74	2004M04	4,38	2008M03	4,05	2012M02	1,78	2016M01	0,62		
2000M06	5,73	2004M05	4,47	2008M04	4,32	2012M03	1,82	2016M02	0,44		
2000M07	5,73	2004M06	4,51	2008M05	4,64	2012M04	1,63	2016M03	0,4		
2000M08	5,69	2004M07	4,61	2008M06	4,79	2012M05	1,08	2016M04	0,48		
2000M09	5,68	2004M08	4,41	2008M07	4,73	2012M06	1,46	2016M05	0,42		
2000M10	5,58	2004M09	4,32	2008M08	4,4	2012M07	1,09	2016M06	0,08		
2000M11	5,37	2004M10	4,18	2008M09	4,28	2012M08	1,11	2016M07	0,03		
2000M12	5,2	2004M11	4,02	2008M10	4,56	2012M09	1,23	2016M08	0		
2001M01	5,15	2004M12	3,87	2008M11	3,72	2012M10	1,23	2016M09	-0,07		
2001M02	5,06	2005M01	3,67	2008M12	3,25	2012M11	1,05	2016M10	0,24		
2001M03	5,02	2005M02	3,77	2009M01	3,7	2012M12	1,03	2016M11	0,34		
2001M04	5,31	2005M03	3,74	2009M02	3,46	2013M01	1,77	2016M12	0,3		
2001M05	5,46	2005M04	3,45	2009M03	3,4	2013M02	1,58	2017M01	0,48		
2001M06	5,36	2005M05	3,31	2009M04	3,46	2013M03	1,48	2017M02	0,18		
2001M07	5,18	2005M06	3,12	2009M05	3,77	2013M04	1,32	2017M03	0,29		
2001M08	5,06	2005M07	3,2	2009M06	3,62	2013M05	1,56	2017M04	0,3		
2001M09	5,01	2005M08	3,08	2009M07	3,66	2013M06	1,86	2017M05	0,25		
2001M10	4,65	2005M09	3,09	2009M08	3,54	2013M07	1,82	2017M06	0,35		
2001M11	4,76	2005M10	3,39	2009M09	3,53	2013M08	2,05	2017M07	0,36		

Appendix 23: Beta: Carlsberg: 5 year rolling beta

Rolling beta over 6 months, weekly observations (Carlsberg)

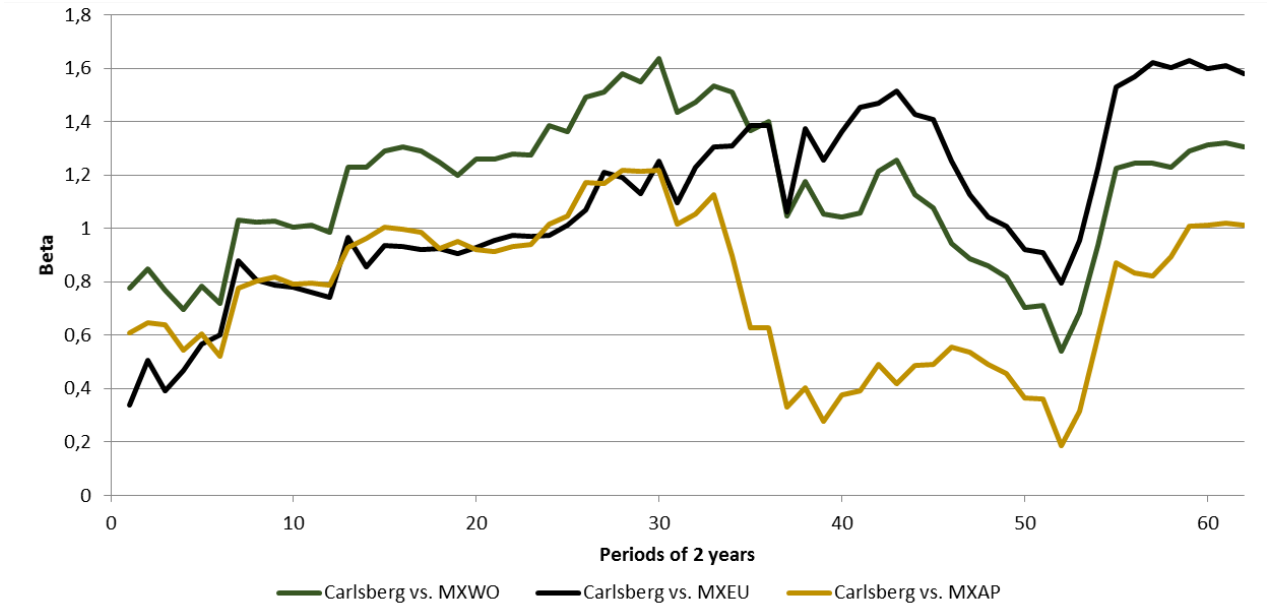


Rolling beta over 1 year, weekly observations (Carlsberg)

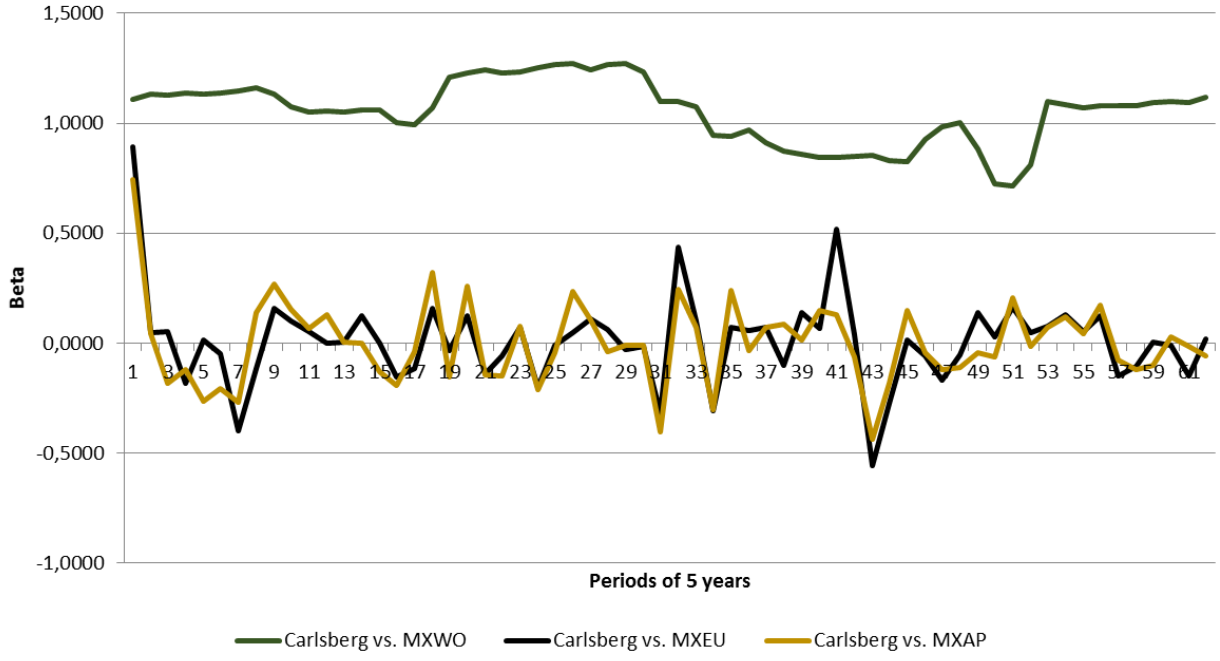


Appendix 24: Beta: Carlsberg: 10 year rolling beta

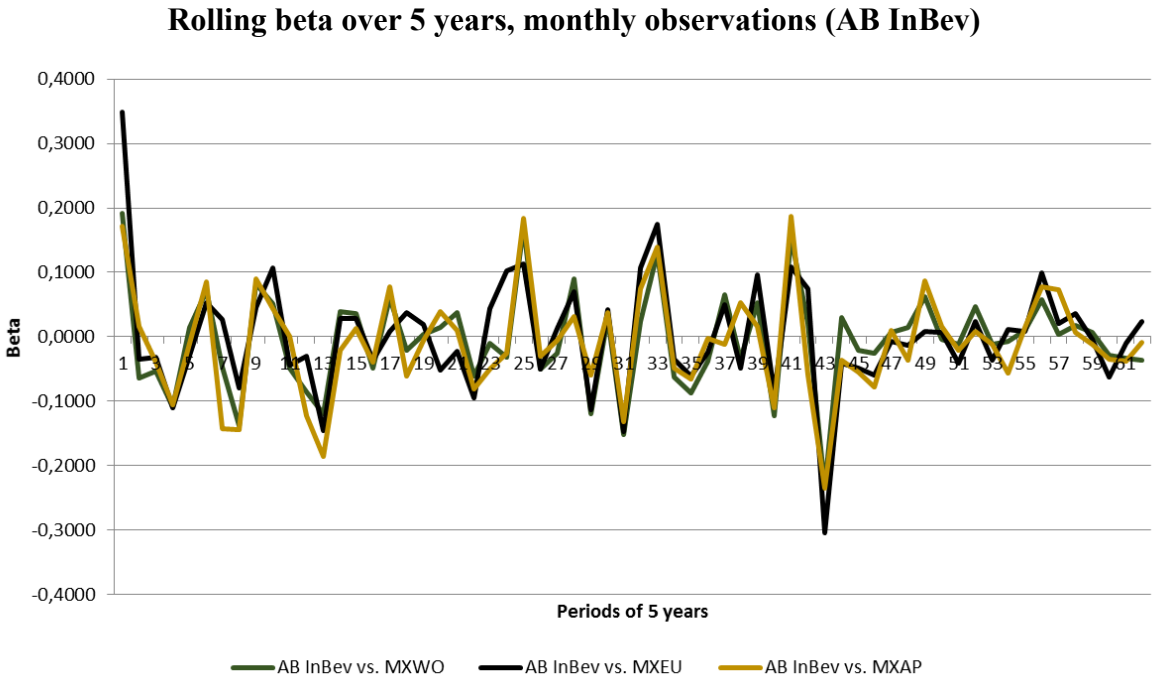
Rolling beta over 2 years, monthly observations (Carlsberg)



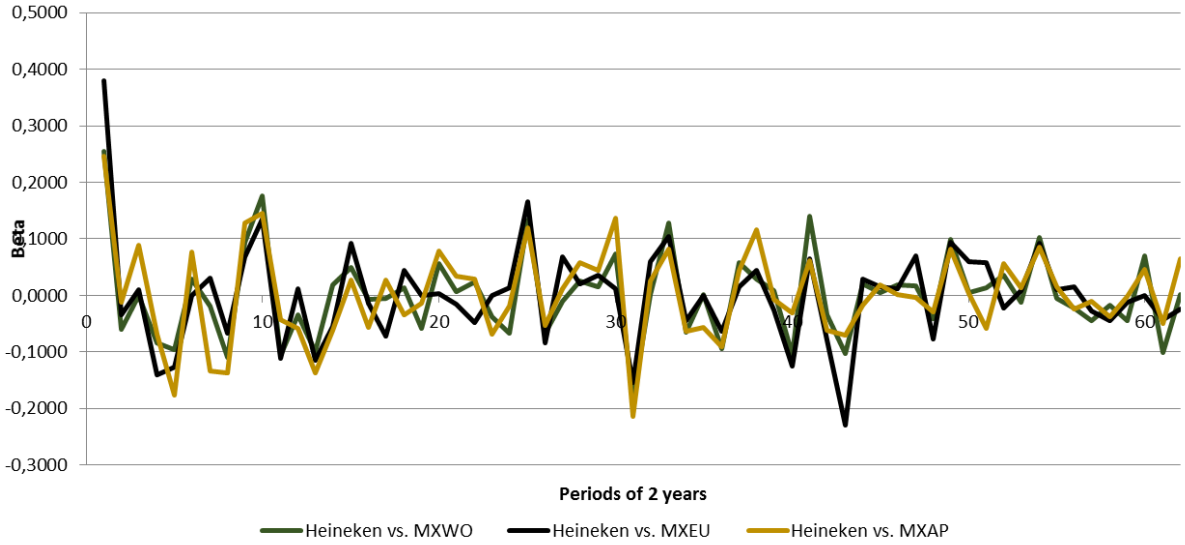
Rolling beta over 5 years, monthly observations (Carlsberg)



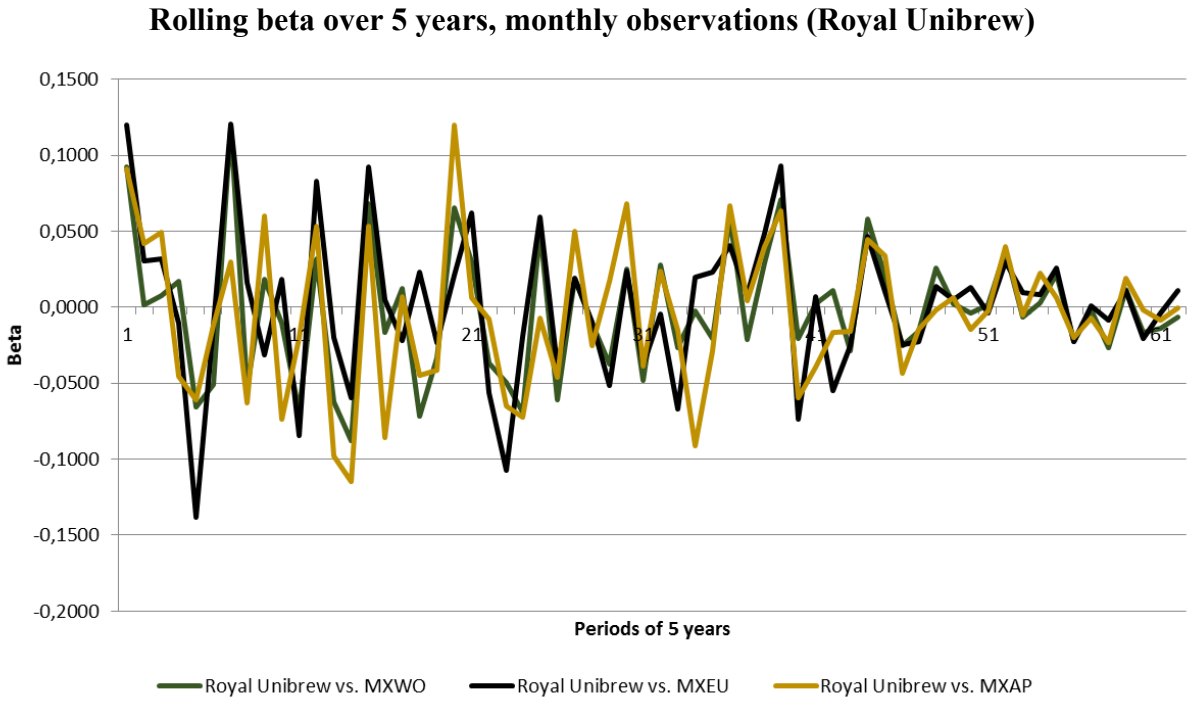
Appendix 25: Beta: AB InBev: 10 year rolling beta



Appendix 26: Beta: Heineken: 10 year rolling beta



Appendix 27: Beta: Royal Unibrew: 10 year rolling beta



Appendix 28: Weighted MRP according to investor location

Investor location	Km	Weight		adj. Km
Avg.(no US DK UK)	11,68%	21%		2,45%
DK	7,60%	18%		1,37%
USA	8,20%	43%		3,53%
UK	8,10%	18%		1,46%
			Total	**8,81%**

Appendix 29: Carlsberg: Optimal Capital Structure (Marginal Tax)

Debt	Equity	D/E	Tax Rate	Interest rate	beta unlev	beta lev	Debt	Interest	Ebit 2017	IC ratio	Fitch	Rating	Rd	Km	Re	WACC
0%	100%	0%	22%	5,56%	0,52	0,52	-	-	9.219.000.000	0,00	0,00	0%	1,88%	8,81%	5,74%	5,74%
5%	95%	5%	22%	5,56%	0,52	0,54347368	5.712.550.000	317.389.278	9.219.000.000	29,05	AAA	0,54%	2,30%	8,81%	5,87%	5,67%
10%	90%	11%	22%	5,56%	0,52	0,56506667	11.425.100.000	634.778.556	9.219.000.000	14,52	AAA	0,54%	2,30%	8,81%	6,02%	5,60%
15%	85%	18%	22%	5,56%	0,52	0,59157647	17.137.650.000	952.167.834	9.219.000.000	9,68	AAA	0,54%	2,30%	8,81%	6,19%	5,53%
20%	80%	25%	22%	5,56%	0,52	0,6214	22.850.200.000	1.269.557.112	9.219.000.000	7,26	AA	0,72%	2,44%	8,81%	6,38%	5,49%
25%	75%	33%	22%	5,56%	0,52	0,6552	28.562.750.000	1.586.946.390	9.219.000.000	5,81	A+	0,90%	2,58%	8,81%	6,60%	5,45%
30%	70%	43%	22%	5,56%	0,52	0,69382857	34.275.300.000	1.904.335.668	9.219.000.000	4,84	A	0,99%	2,65%	8,81%	6,85%	5,41%
35%	65%	54%	22%	5,56%	0,52	0,7384	39.987.850.000	2.221.724.946	9.219.000.000	4,15	A-	1,13%	2,76%	8,81%	7,13%	5,39%
40%	60%	67%	22%	5,56%	0,52	0,7904	45.700.400.000	2.539.114.224	9.219.000.000	3,63	A-	1,13%	2,76%	8,81%	7,47%	5,34%
45%	55%	82%	22%	5,56%	0,52	0,85185455	51.412.950.000	2.856.503.502	9.219.000.000	3,23	A-	1,13%	2,76%	8,81%	7,86%	5,29%
50%	50%	100%	22%	5,56%	0,52	0,9256	57.125.500.000	3.173.892.780	9.219.000.000	2,90	BBB	1,27%	2,87%	8,81%	8,33%	5,28%
55%	45%	122%	22%	5,56%	0,52	1,01573333	62.838.050.000	3.491.282.058	9.219.000.000	2,64	BBB	1,27%	2,87%	8,81%	8,91%	5,24%
60%	40%	150%	22%	5,56%	0,52	1,1284	68.550.600.000	3.808.671.336	9.219.000.000	2,42	BB+	1,98%	3,42%	8,81%	9,63%	5,45%
65%	35%	186%	22%	5,56%	0,52	1,27357143	74.263.150.000	4.126.060.614	9.219.000.000	2,23	BB	2,38%	3,74%	8,81%	10,55%	5,59%
70%	30%	233%	22%	5,56%	0,52	1,4664	79.975.700.000	4.443.449.892	9.219.000.000	2,07	BB	2,38%	3,74%	8,81%	11,79%	5,58%
75%	25%	300%	22%	5,56%	0,52	1,7368	85.688.250.000	4.760.839.170	9.219.000.000	1,94	B+	2,98%	4,20%	8,81%	13,52%	5,94%
80%	20%	400%	22%	5,56%	0,52	2,1424	91.400.800.000	5.078.228.448	9.219.000.000	1,82	B+	2,98%	4,20%	8,81%	16,11%	5,85%
85%	15%	567%	22%	5,56%	0,52	2,8184	97.113.350.000	5.395.617.726	9.219.000.000	1,71	B	3,57%	4,66%	8,81%	20,44%	6,16%
90%	10%	900%	22%	5,56%	0,52	4,1704	102.825.900.000	5.713.007.004	9.219.000.000	1,61	B	3,57%	4,66%	8,81%	29,08%	6,18%
95%	5%	1900%	22%	5,56%	0,52	8,2264	108.538.450.000	6.030.396.282	9.219.000.000	1,53	B	3,57%	4,66%	8,81%	55,02%	6,21%
100%	1%	10000%	22%	5,56%	0,52	41,08	114.251.000.000	6.347.785.560	9.219.000.000	1,45	B-	4,37%	5,29%	8,81%	265,14%	6,78%

Appendix 30: Carlsberg: Optimal Capital Structure (Effective Tax)

Debt	Equity	D/E	Tax Rate	interest rate	beta unlev	beta lev	debt	interest	Ebit 2017	IC ratio	Fitch	Rating	Rd	Km	Re	WACC
0%	100%	0%	27,09%	5,56%	0,52	0,52	-	-	9.219.000.000	0,00	0,00	0%	1,76%	8,81%	5,74%	5,74%
5%	95%	5%	27,09%	5,56%	0,52	0,53995432	5.712.550.000	317.389.278	9.219.000.000	29,05	AAA	0,54%	2,15%	8,81%	5,86%	5,65%
10%	90%	11%	27,09%	5,56%	0,52	0,56212578	11.425.100.000	634.778.556	9.219.000.000	14,52	AAA	0,54%	2,15%	8,81%	6,01%	5,56%
15%	85%	18%	27,09%	5,56%	0,52	0,58690565	17.137.650.000	952.167.834	9.219.000.000	9,68	AAA	0,54%	2,15%	8,81%	6,16%	5,47%
20%	80%	25%	27,09%	5,56%	0,52	0,614783	22.850.200.000	1.269.557.112	9.219.000.000	7,26	AA	0,72%	2,28%	8,81%	6,34%	5,41%
25%	75%	33%	27,09%	5,56%	0,52	0,64637733	28.562.750.000	1.586.946.390	9.219.000.000	5,81	A+	0,90%	2,41%	8,81%	6,54%	5,35%
30%	70%	43%	27,09%	5,56%	0,52	0,68248514	34.275.300.000	1.904.335.668	9.219.000.000	4,84	A	0,99%	2,48%	8,81%	6,77%	5,28%
35%	65%	54%	27,09%	5,56%	0,52	0,724148	39.987.850.000	2.221.724.946	9.219.000.000	4,15	A-	1,13%	2,58%	8,81%	7,04%	5,24%
40%	60%	67%	27,09%	5,56%	0,52	0,77275467	45.700.400.000	2.539.114.224	9.219.000.000	3,63	A-	1,13%	2,58%	8,81%	7,35%	5,16%
45%	55%	82%	27,09%	5,56%	0,52	0,83019891	51.412.950.000	2.856.503.502	9.219.000.000	3,23	A-	1,13%	2,58%	8,81%	7,72%	5,09%
50%	50%	100%	27,09%	5,56%	0,52	0,899132	57.125.500.000	3.173.892.780	9.219.000.000	2,90	BBB	1,27%	2,68%	8,81%	8,16%	5,06%
55%	45%	122%	27,09%	5,56%	0,52	0,98338356	62.838.050.000	3.491.282.058	9.219.000.000	2,64	BBB	1,27%	2,68%	8,81%	8,70%	4,99%
60%	40%	150%	27,09%	5,56%	0,52	1,088698	68.550.600.000	3.808.671.336	9.219.000.000	2,42	BB+	1,98%	3,20%	8,81%	9,37%	5,15%
65%	35%	186%	27,09%	5,56%	0,52	1,22410229	74.263.150.000	4.126.060.614	9.219.000.000	2,23	BB	2,38%	3,49%	8,81%	10,24%	5,24%
70%	30%	233%	27,09%	5,56%	0,52	1,40464133	79.975.700.000	4.443.449.892	9.219.000.000	2,07	BB	2,38%	3,49%	8,81%	11,39%	5,20%
75%	25%	300%	27,09%	5,56%	0,52	1,657396	85.688.250.000	4.760.839.170	9.219.000.000	1,94	B+	2,98%	3,93%	8,81%	13,01%	5,40%
80%	20%	400%	27,09%	5,56%	0,52	2,036528	91.400.800.000	5.078.228.448	9.219.000.000	1,82	B+	2,98%	3,93%	8,81%	15,43%	5,38%
85%	15%	567%	27,09%	5,56%	0,52	2,68841467	97.113.350.000	5.395.617.726	9.219.000.000	1,71	B	3,57%	4,36%	8,81%	19,48%	5,62%
90%	10%	900%	27,09%	5,56%	0,52	3,932188	102.825.900.000	5.713.007.004	9.219.000.000	1,61	B	3,57%	4,36%	8,81%	27,56%	5,62%
95%	5%	1900%	27,09%	5,56%	0,52	7,723508	108.538.450.000	6.030.396.282	9.219.000.000	1,53	B	3,57%	4,36%	8,81%	51,81%	5,61%
100%	1%	10000%	27,09%	5,56%	0,52	38,4332	114.251.000.000	6.347.785.560	9.219.000.000	1,45	B-	4,37%	4,94%	8,81%	248,22%	6,09%

Appendix 31: Scenario 1: Value drivers

Forecast Assumptions	Historical Value divers							Forecast Value Drivers				
Financial Value Drivers	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018E**	**2019E**	**2020E**	**2021E**	**2022E**
Volume growth	3,19%	1,15%	-0,07%	3,06%	-1,41%	-2,16%	-4,13%					
Growth drivers Carlsberg												
Organic growth	6%	3%	1%	2%	2%	2%	1%					
Revenue growth	5,84%	5,73%	-0,97%	-3,07%	1,31%	-4,19%	-1,29%	**0,55%**	**1,10%**	**1,65%**	**2,20%**	**2,75%**
Cost drivers (margins)												
Cost of sales % of revenue	45,91%	46,23%	46,22%	46,25%	46,43%	44,60%	43,78%	43,53%	43,27%	43,01%	42,76%	42,50%
Sales and distribution % of revenue	27,92%	28,01%	26,93%	27,81%	27,99%	27,85%	27,71%	27,74%	27,74%	27,74%	27,74%	27,74%
Administration % of revenue	5,95%	5,98%	6,22%	6,42%	6,29%	7,61%	7,14%	7,01%	6,88%	6,76%	6,63%	6,50%
Other income and expenses % of revenue	0,56%	0,37%	0,19%	0,69%	0,36%	0,32%	0,18%	0,38%	0,38%	0,38%	0,38%	0,38%
Income before tax from associates % of revenue	0,27%	0,17%	0,16%	0,63%	0,56%	0,52%	0,42%	0,39%	0,39%	0,39%	0,39%	0,39%
Operating profit before special items	**21,12%**	**20,36%**	**21,02%**	**21,01%**	**20,49%**	**20,94%**	**22,15%**	**22,49%**	**22,87%**	**23,26%**	**23,64%**	**24,03%**
Special items	1,46%	-1,37%	-0,16%	-0,65%	-0,87%	2,33%	0,20%	-0,13%	-0,13%	-0,13%	-0,13%	-0,13%
EBITDA margin	**22,58%**	**18,98%**	**20,87%**	**20,36%**	**19,62%**	**23,27%**	**22,35%**	**22,35%**	**22,74%**	**23,12%**	**23,51%**	**23,89%**
Depriciation as a % of PPE	12,39%	14,93%	13,39%	17,26%	26,54%	23,12%	18,89%	18,19%	17,48%	16,78%	16,07%	15,37%
Core EBIT margin	**16,56%**	**12,09%**	**14,33%**	**12,73%**	**8,79%**	**13,74%**	**14,92%**	**15,19%**	**15,86%**	**16,52%**	**17,18%**	**17,84%**
Tax rate	25,15%	24,03%	26,08%	27,17%	-48,99%	33,00%	41,39%	27,09%	27,09%	27,09%	27,09%	27,09%
NOPAT margin	**12,34%**	**9,15%**	**10,56%**	**9,15%**	**8,36%**	**9,09%**	**11,85%**	**11,08%**	**11,56%**	**12,04%**	**12,53%**	**13,01%**
Investment drivers												
Intangible assets as a % of revenue	122,46%	119,06%	121,22%	109,35%	111,58%	122,53%	109,68%	111,06%	112,43%	113,81%	115,18%	116,56%
Property, plant and equipment as a % of revenue	48,60%	46,18%	48,84%	44,25%	40,82%	41,22%	39,36%	39,36%	39,36%	39,36%	39,36%	39,36%
Investments in associates and JV as a % of revenue	7,88%	8,58%	2,82%	5,86%	7,15%	7,51%	6,90%	6,67%	6,67%	6,67%	6,67%	6,67%
Other non-current assets	3,96%	4,86%	4,81%	5,26%	5,43%	4,28%	4,23%	4,69%	4,69%	4,69%	4,69%	4,69%
Non-current assets as a % of revenue	**182,90%**	**178,69%**	**177,70%**	**164,72%**	**164,99%**	**175,56%**	**160,17%**	**161,78%**	**163,15%**	**164,53%**	**165,90%**	**167,28%**
NWC decomposed into:												
Inventories as a % of revenue	6,84%	6,76%	7,16%	6,97%	5,84%	6,33%	6,20%	6,19%	6,17%	6,16%	6,14%	6,12%
Trade receivables as a % of revenue	12,38%	11,71%	11,87%	10,66%	8,77%	8,76%	7,46%	7,46%	7,46%	7,46%	7,46%	7,46%
Other current assets as a % of revenue	6,68%	5,27%	7,09%	7,53%	6,01%	6,23%	5,41%	6,32%	6,32%	6,32%	6,32%	6,32%
Deffered tax liabilities as a % of revnue	13,96%	13,29%	12,28%	9,99%	9,06%	9,98%	9,06%	9,37%	9,37%	9,37%	9,37%	9,37%
Trade payables as a % of revenue	17,37%	17,72%	19,46%	18,66%	18,76%	21,56%	21,80%	21,80%	21,80%	21,80%	21,80%	21,80%
Other liabilities as a % of revenue	23,52%	21,47%	21,69%	23,70%	27,75%	29,41%	29,30%	28,55%	27,80%	27,05%	26,30%	25,55%
NWC as a % of revenue	**-28,94%**	**-28,73%**	**-27,32%**	**-29,18%**	**-34,95%**	**-39,62%**	**-41,09%**	**-39,75%**	**-39,02%**	**-38,28%**	**-37,55%**	**-36,81%**
Financial divers												
NIBD as a % of invested capital	37,32%	37,56%	39,30%	48,09%	44,42%	36,97%	32,71%	30,61%	28,31%	26,27%	24,53%	23,09%
Net financial expenses as a % of NIBD	-5,2%	-4,6%	-3,8%	-2,8%	-4,1%	-4,0%	-3,3%	-3,96%	-3,96%	-3,96%	-3,96%	-3,96%

Appendix 32: Scenario 1: Pro forma income statement

Pro forma Income Statement Carlsberg	Historical	Forecasted				
DKK million	2017	2018E	2019E	2020E	2021E	2022E
Net revenue	**61,808**	**62,148**	**62,831**	**63,868**	**65,272**	**67,067**
Cost of Sales	-27,062	-27,051	-27,187	-27,472	-27,908	-28,503
Gross Profit	**34,746**	**35,097**	**35,644**	**36,396**	**37,364**	**38,563**
Sales and distribution expenses	-17,125	-17,243	-17,432	-17,720	-18,109	-18,607
Administrative expenses	-4,413	-4,358	-4,325	-4,315	-4,326	-4,359
Other operating activites, net	0,113	0,237	0,240	0,243	0,249	0,256
Share profit after tax of associates and joint ventures	0,262	0,242	0,244	0,248	0,254	0,261
Operating profit before special items	**13,691**	**13,975**	**14,370**	**14,853**	**15,431**	**16,113**
Special items, net	0,123	-0,084	-0,085	-0,086	-0,088	-0,090
EBITDA	**13,814**	**13,891**	**14,286**	**14,767**	**15,343**	**16,023**
Depriciation, amortisation and impairment losses	-4,595	-4,448	-4,323	-4,217	-4,129	-4,057
EBIT	**9,219**	**9,443**	**9,963**	**10,550**	**11,214**	**11,966**
Corporate tax	-1,458	-2,558	-2,699	-2,858	-3,037	-3,241
NOPAT	**7,327**	**6,885**	**7,264**	**7,692**	**8,176**	**8,725**
Net financial expences before tax	-0,788	-0,954	-0,919	-0,874	-0,839	-0,814
Tax on net financial expenses	0,326	0,258	0,249	0,237	0,227	0,220
Net financial expences	**-0,462**	**-0,695**	**-0,670**	**-0,638**	**-0,612**	**-0,594**
Net earnings	**2,065**	**6,190**	**6,594**	**7,055**	**7,565**	**8,131**

Appendix 33: Scenario 1: Pro forma Cash Flow Statement

Cash flow statement	Historical	Forecasted				
DKK million	2017	2018E	2019E	2020E	2021E	2022E
NOPAT	**7,327**	**6,885**	**7,264**	**7,692**	**8,176**	**8,725**
Depriciation, amortisation and impairment losses	4,595	4,448	4,323	4,217	4,129	4,057
Changes in inventories	0,129	-0,011	-0,032	-0,054	-0,076	-0,100
Changes in trade receivables	0,874	-0,025	-0,051	-0,077	-0,105	-0,134
Changes in other current assets	0,558	-0,582	-0,043	-0,065	-0,089	-0,113
Changes in deferred tax liabilities	-0,649	0,222	0,064	0,097	0,132	0,168
Changes in trade payables	-0,023	0,074	0,149	0,226	0,306	0,391
Changes in other operating liabilities	-0,301	-0,367	-0,277	-0,191	-0,110	-0,032
Cash flow from operations	**12,510**	**10,644**	**11,397**	**11,845**	**12,364**	**12,963**
Investments, non-current assets	-3,954	-5,991	-6,292	-6,786	-7,338	-7,956
Free cash flow to the firm	**8,556**	**4,653**	**5,105**	**5,058**	**5,026**	**5,007**
Net financial expenses	-0,462	-0,695	-0,670	-0,638	-0,612	-0,594
Dividends (50% payout)	-0,702	-3,095	-3,297	-3,527	-3,782	-4,066
Free cash flow to equity holders	**7,392**	**0,863**	**1,137**	**0,893**	**0,632**	**0,347**
Cash surplus	**-7,392**	**-0,863**	**-1,137**	**-0,893**	**-0,632**	**-0,347**

Appendix 34: Scenario 1: Pro forma Balance Sheet

Pro forma balance sheet	Historical	Forecasted				
DKK million	2017	2018E	2019E	2020E	2021E	2022E
Operating Assets						
Non-current assets						
Intangible assets	67,793	69,020	70,643	72,686	75,182	78,171
Property, plant and equipment	24,325	24,459	24,728	25,136	25,688	26,395
Investments	4,266	4,147	4,192	4,262	4,355	4,475
Other non-current assets	2,615	2,916	2,948	2,997	3,063	3,147
Total non-current assets	**98,999**	**100,542**	**102,511**	**105,080**	**108,289**	**112,188**
Current assets						
Inventories	3,834	3,845	3,878	3,932	4,008	4,107
Trade receivables	4,611	4,636	4,687	4,765	4,869	5,003
Other current assets	3,345	3,927	3,970	4,036	4,124	4,238
Total current assets	**11,790**	**12,408**	**12,535**	**12,732**	**13,001**	**13,348**
Total assets	**110,789**	**112,950**	**115,046**	**117,812**	**121,290**	**125,536**
Non-interest-bearing debt						
Deferred tax liabilities	5,601	5,823	5,887	5,984	6,116	6,284
Trade payables	13,474	13,548	13,697	13,923	14,229	14,620
Other operating liabilities	18,111	17,744	17,467	17,276	17,166	17,134
Total non-interest-bearing debt	**37,186**	**37,115**	**37,051**	**37,183**	**37,511**	**38,039**
Invested capital (NOA)	**73,603**	**75,835**	**77,995**	**80,629**	**83,780**	**87,498**
Financial Assets						
Equity						
Total equity begin		49,525	52,620	55,917	59,444	63,227
Profit after tax		6,190	6,594	7,055	7,565	8,131
Dividends (50% payout)		-3,095	-3,297	-3,527	-3,782	-4,066
Total equity end	**49,525**	**52,620**	**55,917**	**59,444**	**63,227**	**67,292**
Net-interest-bearing debt (NIBD)	**24,078**	**23,215**	**22,078**	**21,185**	**20,553**	**20,205**
Invested Capital	**73,603**	**75,835**	**77,995**	**80,629**	**83,780**	**87,498**
Equity ratio	**67,29%**	**69,39%**	**71,69%**	**73,73%**	**75,47%**	**76,91%**

Appendix 35: Scenario 1: Key Ratios

Ratios	Historical	Historical	Forecasted				
	Average	2017	2018E	2019E	2020E	2021E	2022E
ROIC	7,3%	10,0%	9,08%	9,31%	9,54%	9,76%	9,97%
EBITDA margin	21,1%	22,4%	22,35%	22,74%	23,12%	23,51%	23,89%
PM	10,1%	11,9%	11,08%	11,56%	12,04%	12,53%	13,01%
ATO	0,72	0,84	0,82	0,81	0,79	0,78	0,77
ROE	9,8%	4,17%	11,76%	11,79%	11,87%	11,96%	12,08%
NBC	-3,3%	-1,9%	-3,0%	-3,0%	-3,0%	-3,0%	-2,9%

Appendix 36: Scenario 2: Value drivers

Forecast Assumptions	Historical Value divers							Forecast Value Drivers				
Financial Value Drivers	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018E**	**2019E**	**2020E**	**2021E**	**2022E**
Volume growth	3,19%	1,15%	-0,07%	3,06%	-1,41%	-2,16%	-4,13%					
Growth drivers Carlsberg												
Organic growth	6%	3%	1%	2%	2%	2%	1%	**0,49%**	**0,97%**	**1,46%**	**1,94%**	**2,43%**
Revenue growth	5,84%	5,73%	-0,97%	-3,07%	1,31%	-4,19%	-1,29%	43,52%	43,26%	43,00%	42,74%	42,48%
Cost drivers (margins)												
Cost of sales	45,91%	46,23%	46,22%	46,25%	46,43%	44,60%	43,78%	25,35%	23,00%	20,64%	18,29%	15,93%
Sales and distribution	27,92%	28,01%	26,93%	27,81%	27,99%	27,85%	27,71%	6,74%	6,34%	5,94%	5,54%	5,14%
Administration	5,95%	5,98%	6,22%	6,42%	6,29%	7,61%	7,14%	0,18%	0,18%	0,18%	0,18%	0,18%
Other income and expenses	0,56%	0,37%	0,19%	0,69%	0,36%	0,32%	0,18%	0,44%	0,46%	0,48%	0,50%	0,52%
Income before tax from asociates	0,27%	0,17%	0,16%	0,63%	0,56%	0,52%	0,42%	**25,01%**	**28,05%**	**31,08%**	**34,11%**	**37,15%**
Operating profit before special items	**21,12%**	**20,36%**	**21,02%**	**21,01%**	**20,49%**	**20,94%**	**22,15%**	-0,13%	-0,13%	-0,13%	-0,13%	-0,13%
Special items	1,46%	-1,37%	-0,16%	-0,63%	-0,87%	2,33%	0,20%	**24,88%**	**27,91%**	**30,94%**	**33,98%**	**37,01%**
EBITDA margin	**22,58%**	**18,98%**	**20,87%**	**20,36%**	**19,62%**	**23,27%**	**22,35%**	18,19%	17,48%	16,78%	16,07%	15,37%
Depriciation as % of PPE	12,39%	14,93%	13,39%	17,26%	26,54%	23,12%	18,89%	**17,72%**	**21,03%**	**24,34%**	**27,65%**	**30,97%**
Core EBIT margin	**16,56%**	**12,09%**	**14,33%**	**12,73%**	**8,79%**	**13,74%**	**14,92%**	27,09%	27,09%	27,09%	27,09%	27,09%
Tax rate	25,15%	24,03%	26,08%	27,17%	-48,99%	33,00%	41,39%	**12,92%**	**15,33%**	**17,75%**	**20,16%**	**22,58%**
NOPAT margin	**12,34%**	**9,15%**	**10,56%**	**9,15%**	**8,36%**	**9,09%**	**11,85%**					
Investment drivers												
Intangible assets as a % of revenue	122,46%	119,06%	121,22%	109,35%	111,58%	122,55%	109,68%	111,06%	112,43%	113,81%	115,18%	116,56%
Property, plant and equipment as a % of revenue	48,60%	46,18%	48,84%	44,25%	40,82%	41,22%	39,36%	39,36%	39,36%	39,36%	39,36%	39,36%
Investments in associates and JV as a % of revenue	7,88%	8,58%	2,82%	5,86%	7,15%	7,51%	6,90%	6,67%	6,67%	6,67%	6,67%	6,67%
Other non-current assets	3,96%	4,86%	4,81%	5,26%	5,43%	4,28%	4,23%	4,69%	4,69%	4,69%	4,69%	4,69%
Non-current assets as a % of revenue	**182,90%**	**178,69%**	**177,70%**	**164,72%**	**164,99%**	**175,56%**	**160,17%**	**161,78%**	**163,15%**	**164,53%**	**165,90%**	**167,28%**
NWC decomposed into:												
Inventories as a % of revenue	6,84%	6,76%	7,16%	6,97%	5,84%	6,33%	6,20%	6,19%	6,17%	6,16%	6,14%	6,12%
Trade receivables as a % of revenue	12,38%	11,71%	11,87%	10,66%	8,77%	8,76%	7,46%	7,46%	7,46%	7,46%	7,46%	7,46%
Other current assets as a % of revnue	6,68%	5,27%	7,09%	7,33%	6,01%	6,23%	5,41%	6,32%	6,32%	6,32%	6,32%	6,32%
Deffered tax liabilities as a % of revnue	13,96%	13,29%	12,28%	9,99%	9,06%	9,98%	9,06%	9,37%	9,37%	9,37%	9,37%	9,37%
Trade payables as a % of revenue	17,37%	17,72%	19,46%	18,66%	18,76%	21,56%	21,80%	21,80%	21,80%	21,80%	21,80%	21,80%
Other liabilities as a % of revenue	23,52%	21,47%	21,69%	25,70%	27,75%	29,41%	29,30%	28,55%	27,80%	27,05%	26,30%	25,55%
NWC as a % of revenue	**-28,94%**	**-28,73%**	**-27,32%**	**-29,18%**	**-34,95%**	**-39,62%**	**-41,09%**	**-39,75%**	**-39,02%**	**-38,28%**	**-37,55%**	**-36,81%**
Financial divers												
NIBD as a % of invested capital	37,32%	37,56%	39,30%	48,09%	44,42%	36,97%	32,71%	29,82%	25,92%	21,53%	16,74%	11,61%
Net financial expenses as a % of NIBD	-5,2%	-4,6%	-3,8%	-2,8%	-4,1%	-4,0%	-3,3%	-3,96%	-3,96%	-3,96%	-3,96%	-3,96%

Appendix 37: Scenario 2: Pro forma income statement

Pro forma Income Statement Carlsberg	Historical	Forecasted				
DKK million	2017	2018E	2019E	2020E	2021E	2022E
Net revenue	**61,808**	**62,108**	**62,712**	**63,625**	**64,861**	**66,437**
Cost of Sales	-27,062	-27,032	-27,132	-27,361	-27,724	-28,225
Gross Profit	**34,746**	**35,076**	**35,580**	**36,264**	**37,137**	**38,212**
Sales and distribution expenses	-17,125	-15,745	-14,421	-13,133	-11,860	-10,583
Administrative expenses	-4,413	-4,186	-3,976	-3,779	-3,593	-3,415
Other operating activites, net	0,113	0,114	0,115	0,116	0,119	0,121
Share profit after tax of associates and joint ventures	0,262	0,275	0,290	0,306	0,325	0,345
Operating profit before special items	**13,691**	**15,534**	**17,588**	**19,775**	**22,127**	**24,680**
Special items, net	0,123	-0,084	-0,085	-0,086	-0,087	-0,090
EBITDA	**13,814**	**15,450**	**17,503**	**19,689**	**22,040**	**24,591**
Depriciation, amortisation and impairment losses	-4,595	-4,445	-4,315	-4,201	-4,103	-4,019
EBIT	**9,219**	**11,005**	**13,188**	**15,488**	**17,936**	**20,572**
Corporate tax	-1,458	-2,981	-3,572	-4,195	-4,858	-5,572
NOPAT	**7,327**	**8,024**	**9,616**	**11,293**	**13,078**	**15,000**
Net financial expences before tax	-0,788	-0,954	-0,895	-0,799	-0,685	-0,552
Tax on net financial expenses	0,326	0,258	0,242	0,216	0,186	0,150
Net financial expences	**-0,462**	**-0,695**	**-0,653**	**-0,583**	**-0,499**	**-0,402**
Net earnings	**2,065**	**7,329**	**8,964**	**10,710**	**12,579**	**14,598**

Appendix 38: Scenario 2: Pro forma Cash Flow Statement

Cash flow statement	Historical	Forecasted				
DKK million	2017	2018E	2019E	2020E	2021E	2022E
NOPAT	**7,327**	**8,024**	**9,616**	**11,293**	**13,078**	**15,000**
Depriciation, amortisation and impairment losses	4,595	4,445	4,315	4,201	4,103	4,019
Changes in inventories	0,129	-0,009	-0,027	-0,046	-0,066	-0,086
Changes in trade receivables	0,874	-0,022	-0,045	-0,068	-0,092	-0,118
Changes in other current assets	0,558	-0,579	-0,038	-0,058	-0,078	-0,100
Changes in deferred tax liabilities	-0,649	0,218	0,057	0,086	0,116	0,148
Changes in trade payables	-0,023	0,065	0,132	0,199	0,269	0,343
Changes in other operating liabilities	-0,301	-0,378	-0,299	-0,224	-0,153	-0,085
Cash flow from operations	**12,510**	**11,764**	**13,710**	**15,383**	**17,178**	**19,122**
Investments, non-current assets	-3,954	-5,924	-6,153	-6,567	-7,029	-7,545
Free cash flow to the firm	**8,556**	**5,840**	**7,557**	**8,816**	**10,149**	**11,576**
Net financial expenses	-0,462	-0,695	-0,653	-0,583	-0,499	-0,402
Dividends (50% payout)	-0,702	-3,664	-4,482	-5,355	-6,289	-7,299
Free cash flow to equity holders	**7,392**	**1,480**	**2,423**	**2,878**	**3,360**	**3,875**
Cash surplus	**-7,392**	**-1,480**	**-2,423**	**-2,878**	**-3,360**	**-3,875**

Appendix 39: Scenario 2: Pro forma Balance Sheet

Pro forma balance sheet	Historical	Forecasted				
DKK million	2017	2018E	2019E	2020E	2021E	2022E
Operating Assets						
Non-current assets						
Intangible assets	67,793	68,976	70,508	72,410	74,709	77,437
Property, plant and equipment	24,325	24,443	24,681	25,040	25,527	26,147
Investments	4,266	4,144	4,184	4,245	4,328	4,433
Other non-current assets	2,615	2,914	2,943	2,986	3,044	3,117
Total non-current assets	**98,999**	**100,478**	**102,316**	**104,682**	**107,607**	**111,134**
Current assets						
Inventories	3,834	3,843	3,870	3,917	3,983	4,069
Trade receivables	4,611	4,633	4,678	4,747	4,839	4,956
Other current assets	3,345	3,924	3,962	4,020	4,098	4,198
Total current assets	**11,790**	**12,401**	**12,511**	**12,683**	**12,920**	**13,223**
Total assets	**110,789**	**112,878**	**114,827**	**117,365**	**120,527**	**124,357**
Non-interest-bearing debt						
Deferred tax liabilities	5,601	5,819	5,876	5,961	6,077	6,225
Trade payables	13,474	13,539	13,671	13,870	14,140	14,483
Other operating liabilities	18,111	17,733	17,434	17,210	17,058	16,973
Total non-interest-bearing debt	**37,186**	**37,091**	**36,981**	**37,042**	**37,275**	**37,681**
Invested capital (NOA)	**73,603**	**75,787**	**77,846**	**80,323**	**83,252**	**86,676**
Financial Assets						
Equity						
Total equity begin		49,525	53,189	57,671	63,026	69,316
Profit after tax		7,329	8,964	10,710	12,579	14,598
Dividends (50% payout)		-3,664	-4,482	-5,355	-6,289	-7,299
Total equity end	**49,525**	**53,189**	**57,671**	**63,026**	**69,316**	**76,614**
Net-interest-bearing debt (NIBD)	**24,078**	**22,598**	**20,175**	**17,297**	**13,937**	**10,061**
Invested Capital	**73,603**	**75,787**	**77,846**	**80,323**	**83,252**	**86,676**
Equity ratio	**67,29%**	**70,18%**	**74,08%**	**78,47%**	**83,26%**	**88,39%**

Appendix 40: Scenario 2: Key Ratios

Ratios	Historical	Historical	Forecasted				
	Average	2017	2018E	2019E	2020E	2021E	2022E
ROIC	7,3%	10,0%	10,59%	12,35%	14,06%	15,71%	17,31%
EBITDA margin	21,1%	22,4%	24,88%	27,91%	30,94%	33,98%	37,01%
PM	10,1%	11,9%	12,92%	15,33%	17,75%	20,16%	22,58%
ATO	0,72	0,84	0,82	0,81	0,79	0,78	0,77
ROE	9,8%	4,17%	13,78%	15,54%	16,99%	18,15%	19,05%
NBC	-3,3%	-1,9%	-3,1%	-3,2%	-3,4%	-3,6%	-4,0%