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The Volvo Way to Market

A case study of private company valuation under different exit scenarios

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Executive Summary

In recent years, Volvo Cars AB ('Volvo') has taken several actions that outset the rumours that its current owner was planning for an exit via a market introduction. While an initial public offering (IPO) is the consensus exit option amongst financial journalists, little attention has been devoted to the value of the company or whether there is an alternative exit option. Thus, this thesis sought to answer a research question that covered both aspects; firstly, value Volvo Cars AB on a stand-alone basis (as in the case of an IPO) and, secondly, to explore whether the company was an attractive investment case to a third party, and if so, a valuation from the perspective of the prospective acquirer would be performed.

As the research question entails flexibility and requires subjective judgements, a pragmatic case study strategy was taken on. In the quest for finding reliable answers, numerous well-established theoretical models and primary methodologies related to the subject were applied. The matter was investigated by, firstly, researching and understanding critical aspects of Volvo, such as its value proposition, market position, historical performance, and the competitive landscape in which it competes. Secondly, based on the fundamental analysis of Volvo and its peers, a value of the company was derived using both a discounted cash flow (DCF) analysis and comparable companies analysis. Finally, using the fundamental analysis and investment rationale from an alternate buyer perspective, an exploration of likely exit options was performed.

The strategic analysis illustrated the challenges of navigating the automobile industry; increasing intensity of rivalry, heavy capital expenditures, technological disruption, and government regulations were, among other factors, identified as the micro-and macroeconomic factors that profoundly influence the industry and its future profitability. However, despite the company's disadvantage in size in an industry characterised by economies of scale, it has successfully penetrated the market, primarily driven by a rich heritage that has created a strong brand. From this, the company's stand-alone IPO-range was estimated to €16.245 - €20.364 million.

A thorough assessment of Volvo as an investment case, both from the perspective of a financial and strategic buyer, recognised Volvo as an attractive investment for the strategic buyer. After sourcing for a potential acquirer, Renault was identified as the most likely party. By adjusting the DCF analysis for synergistic benefits, the investment value of Volvo to Renault was estimated to €23.536 million. Lastly, by weighing the different options against each other, taking current market conditions into account, it was concluded that a strategic buyer would assign the greatest value to the company and, therefore, this represents the value maximising exit strategy.

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1 Introduction

1.1 Preface

On December 28, 2015, Financial Times reported that Volvo Cars AB ('Volvo' or 'the company') was preparing to issue bonds for the first time as a stand-alone carmaker (Sharman, 2015). This gave substance to the speculations of Volvo becoming a listed company. Volvo was separated out of the listed Volvo Group, now a truck, buses, and construction equipment manufacturer, in 1999 after Ford Motor Company acquired the company. After a struggling decade under American ownership, Zhejiang Geely of China, with owner Li Shufu, acquired the company in 2010. Since then, the company has thrived under Geely's ownership.

The potential move into capital markets was therefore perceived as a prelude to a stock market debut. The rumour was fuelled by a comment from Volvo's CEO Håkan Samuelsson to Financial Times stating that "We have to be ready to go out on the bond market . . . as part of acting as a listed company with all the transparency and reporting that is required. So I wouldn't exclude that we would go out on the bond market in 2016" (Sharman, 2015). Both media and individuals close to the company pointed out the elephant in the room – what is point of behaving like a listed company if there is no intention of becoming one? However, according to Chinese owners there were no "immediate" plans for Volvo to be a listed or to access the bond markets.

Fast-forwarding one year to December 13, 2016, front page news in the Swedish business newspaper Dagens Industri (DI) read "Volvo Cars has never been closer to a market debut" (Hägerstrand, 2016b). This conclusion was reached after revelations that the company had been meeting with what was described as "key investors" (Hägerstrand, 2016a). Nevertheless, the company continued stating that going public in the near future was off the table. One of reasons for this was said to be Li Shufu's concerns about the market not valuing Volvo according to his expectations. However, once the company raised SEK 5bn in convertible preference shares in December, shares that can be converted into listed ordinary shares, from three large Swedish institutional investors, financial reports argued that it became evident that the company was preparing for a market debut (Hägerstrand, 2016b).

The purpose of this thesis is first and foremost a valuation of Volvo Cars AB, as if the company were going public (initial public offering (IPO)). Secondly, this thesis will explore whether listing Volvo is the most beneficial exit strategy. In other words, it will investigate if there is another exit option that create greater value. The field of study is pursued and valuable for a number of reasons. First, as pointed out by Petersen, Plenborg and Schøler (2006), most valuation literature ignores the valuation of privately held firms. The valuation of private companies introduces a range of additional issues, such as the lack of stock market data and less informative annual reports, in comparison to valuing a listed company. Second, the number

of mergers and acquisitions (M&A) of privately held firms has increased considerably, consequently valuation of private firms has become increasingly more important (Petersen et al., 2006; Ang and Kohers, 2001). Third, the issue will provide the authors with a contemporary case and a context that allows for a practical application of well-established theoretical frameworks and methodologies.

Important to note is that the perspective of this thesis is equivalent to that of an 'outsider analyst', meaning the only accessible information is that which is publicly available.

1.2 Problem Discussion

The process and principles of valuing a private company (a company that is not listed on a stock exchange) is not different from the process and principles of valuing a public company. However, there are estimation issues that are unique to private businesses. Firstly, since private companies are often not governed by the strict accounting and reporting standards of public companies so the information available for valuation tends to be much more limited both in terms of history and depth. Additionally, there is no market value for equity and often times not for debt, which means that any input that requires them cannot be estimated (Damodaran A. , Investment valuation: Tools and techniques for determining the value of any asset, 2012). This issue becomes evident in market price based risk measures such as beta and bond ratings, which are both potentially non-existing for private firms. While the fundamental inputs in the valuation do not change, the process of estimating may be different given the circumstances surrounding private firms. Nevertheless, as with public companies, from a present value perspective, the value of the firm is the present value of estimated cash flows that are discounted at an appropriate discount rate, which is based upon the riskiness of cash flows (Damodaran A. , Investment valuation: Tools and techniques for determining the value of any asset, 2012).

When projecting a private firm's cash flows, it is often times done without the benefit of readily available projections or management guidance. Therefore, in order to reasonably forecast financial performance in the absence of such guidance, it is necessary to develop a wide understanding of the company and the industry, including taking sector trends and consensus estimates for public comparable companies into account (Pearl & Rosenbaum, 2013). Further, to accurately assess the competitive environment in which the company operates and its outlooks, analysing both the external and the internal conditions that influence performance is essential (Evans & Mellen, 2010). However, the lack of information and the fact that projections and estimates of future cash flows are based on forecasts and assumptions augments the embedded uncertainty of the present value of the company. Consequently, alternative market valuation methods are needed, such as comparable companies analysis or precedent transaction analysis, which provide a market benchmark for which it is possible to establish valuation for a private company.

The ultimate value of the company corresponds to the value that different buyers ascribe the business. As valuing a company involves subjectivity, the value depends to a great degree on the motive of the

valuation; a strategic buyer interested in the company's operation or a financial buyer searching for near-term returns. Strategic buyers seek a good fit with some aspects of the seller's business and when the synergies are significant, the strategic buyer is often willing to pay more (PwC, 2013). The motives for a financial buyer is different from those of a strategic buyer, it often involves using the benefit of significant financial leverage to improve returns, provide financial support for the business as it pays down debt and grows and then exit the investment for a profit in the short to medium term. The value the financial buyer is willing to pay is dependent on the willingness of the credit markets to extend loans and the terms of those loans, and in some cases financial buyers can actually become stronger buyers than strategic buyers (PwC, 2013).

Despite this qualitative framing, it boils down to a quantitative question: what is the value of the business? "Value" is an expression of the worth of something. Hence, before proceeding it is imperative what this thesis mean by "value". Given the different reasons for valuing private equity, where the primary one is transaction related (IPOs, acquisitions et cetera.) but also compliance related (tax-or financial reporting) and litigation related (damages, shareholder disputes, or lost profits), the motive matters and affect the value of the company (Damodaran A. , Investment valuation: Tools and techniques for determining the value of any asset, 2012). Definitions of value estimates include "fair market value", "market value", "fair value", "investment value", and "intrinsic value". All the definitions are conditional on the purpose for the valuation and the status of the company. Therefore, it is necessary to clarify the relevant and different definitions of value that lead to different value estimates.

- *Fair market value* is defined by the Revenue Ruling 59-60 of the Internal Revenue Service as "… the amount at which the property would change hands between a willing buyer and a willing seller when the former is not under compulsion to buy and the latter is not under any compulsion to sell, both parties having reasonable knowledge of the relevant facts" (Evans & Mellen, 2010). This definition of value is includes the following assumptions: (1) buyers and sellers are hypothetical, typical of the market, and acting in their own self-interest, (2) the hypothetical buyer is prudent without synergistic benefit, (3) the business will continue as a going concern and not be liquidated, (4) the hypothetical sale will be for cash, and (5) the parties are able as well as willing (Evans & Mellen, 2010). As the assumptions imply, the buyer under fair market value is considered to be a financial buyer rather than a strategic buyer and thus the value represent the company on a stand-alone basis.
- *Intrinsic Value* is defined as the value that an investor considers, on the basis of an evaluation or available facts, to be the "true" or "real" value and that this value will become the *fair market value* when other investors reach the same conclusion. Put differently, this is the value derived from a, for example, discounted cash flow analysis.
- *Investment Value* is the value to a particular buyer based on the buyer's circumstances, expectations and investment requirements. It differs from the other definitions because it focuses on a specific

buyer rather than the value in a "market" context (Evans & Mellen, 2010). This value includes the synergies or other advantages the strategic buyer anticipates will be created through the acquisition. Following, the investment value is likely different to each potential buyer because of the different synergies that each can create. The increase in investment value of over the company's fair market value is most commonly referred to as control premium or acquisition premium (Evans & Mellen, 2010). The premium paid represents the fact that the buyer acquires control of the target (the company being acruired) through the acquisition and the potential of achieving the synergies that the combination will create, where the latter is the primary force driving the transaction.

Given the previous discussion, three questions emerge:

- What is the fair stand-alone market value of Volvo Cars AB and how is this value best estimated?
- Is there a prospective buyer of Volvo Cars AB and why should a buyer pay more than fair market value?
- How much above fair market value should the buyer pay – in other words, how large is the control/acquisition premium?

The answer to these questions involves business value, more specifically, what creates it, how to measure it, how to build it, how to preserve it, and how to maximise it though a transaction. Furthermore, this also includes searching for prospective buyer(s), identifying and quantifying the synergies they could achieve through a transaction, which is a process that involves numerous challenges. For example, this process requires forecasting returns both on a stand-alone basis and, contingent on whether there is a likely buyer, as if the company was under another company's ownership. Further, these returns are then discounted using the cost of capital to derive the value of the business. The issue here is firstly estimating the cost of capital for the company as a stand-alone ongoing entity, and, secondly, whether it should be adjusted to reflect to the returns in the discounting process.

1.3 Problem Statement

Based on the discussion in the preceding two sections, this thesis will pursue following research question:

"What is the equity value of Volvo Cars AB and in an exit scenario, which exit strategy generates most value?"

Important to point out is the flexibility the research question encompasses; the conclusion will be guided by the findings in the thesis, rendering a conclusion which might be that keeping the company is the most valuable alternative.

In order to fulfil the aim of this thesis, numerous sub-questions will be addressed to structure the report and establish grounds for pursuit of the objectives and ultimately the research question. These sub-questions, as listed below, can be separated into three categories: strategic, financial, and aspects contingent on the findings in the thesis. The different categories of sub-questions will be addressed in different sections in the report.

Strategic

- *What are the macro- and microeconomic factors that influence the performance of Volvo Cars AB?*
- *What are the characteristics of the competitive landscape?*
- *How is Volvo Cars AB positioning itself to exploit the market and generate value?*

Financial

- *How has Volvo Cars AB performed historically and in comparison to its closest peers?*
- *How are Volvo Cars AB financials expected to develop?*
- *What is Volvo Cars AB cost of capital?*

Contingent

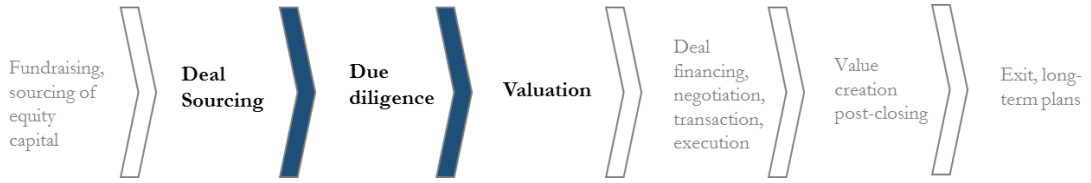
- *What are the possibilities in terms of an acquirer?*
- *How can a potential M&A transaction create value?*
- *How do current market conditions affect the exit strategy of Volvo Cars AB owners?*

1.4 Delimitations

This thesis, first and foremost, go through the process of valuing a private company and secondly, the procedures of identifying a potential buyer, both strategic and financial, and the different value a buyer assign to the business. The derivation of these values will constitute the definitive boundary for this thesis. Consequently, in a broad sense, the thesis only considers the information and theories related to these subjects. It includes applying valuation theory and methods, strategic frameworks to assess both the micro- and macroenvironment, as suggested in finance literature. Moreover, supporting information depending on the context will also be used, all in order to derive reliable values. Thus the accuracy of the value estimates is dependent on subjective judgements and interpretations from the methods and frameworks applied. Though using other fields of studies' methods and models might have increased the precision of estimates, the theory related to the subject is considered sufficient for fulfilling the purpose of the thesis.

The scope of this thesis is illustrated in figure 1. This thesis focus on the deal sourcing (searching for a buyer), the due diligence (the process leading up the valuation), and lastly a valuation based on the findings in the previous steps. Thus, the preceding and succeeding steps are outside the boundaries of this thesis.

Figure 1. Typical investment process roadmap



Source: Adopted from Vild & Zeisberger (2014)

With regards to delimitations of the quantitative and qualitative data, this thesis is limited to publicly available information. Consequently, only external information, such as financial statements, industry information, and competitor information from multiple sources are used to support the process finding a result. Lastly, the valuation and following conclusion is exclusively based on the case study at hand. The valuation date is set to 1st of April 2017. Released information beyond this date, such as quarterly financial reports, will not be considered.

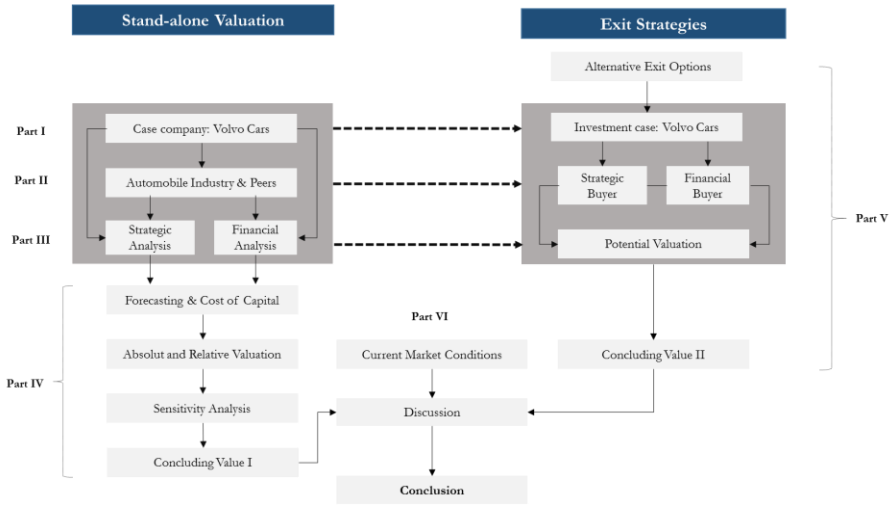
1.5 Structure & Outline

To provide the reader of an overview, the overall structure of this thesis and how sections are interrelated are illustrated in figure 2.

In *Part I,* the thesis introduces the case company. Fundamental in valuation is gaining a solid understanding of the case company.

Part II defines the industry in which the company competes as well as present a framework for establishing a peer group. It wraps with a conclusive peer group that will be applied to the multiple valuation.

Figure 2. Structure and outline overview



Source: Own construction

Part III is a fundamental assessment of Volvo based on a thorough strategic and financial analysis. The identified value drivers in the financial analysis and the strategic analysis be the basis for the resulting budget and overall assessment of the company's outlooks.

Part IV starts with building pro forma statements as well as an estimation of the company's cost of capital. From this, free cash flows are estimated and discounted with the cost of capital using DCF and EVA analysis. To benchmark these absolute valuation methodologies, a multiple-based approach is employed. Based on these two methodologies, the fair market value range for the company is derived. Lastly this part deals with the uncertainty involved in valuation through a risk analysis.

Part V covers the second objective of this thesis, namely to investigate alternative exit options. It will take the perspective of different potential buyers to assess whether Volvo is an attractive investment case. If identified, the investment value for this buyer is estimated.

Finally, in *Part VI* findings are discussed and a conclusion tied to the research question is presented.

1.6 Formats & Definitions

This section clarifies the formats and definitions that are used in this thesis. As a rule, numbers are presented in million Euros (€). If exceptions are made this will be clearly stated within the table or figure. All monetary amounts are presented in Euros. Whenever it has been necessary to convert foreign currencies to euros (primarily the conversion of financial statements) a 52-week average exchange rate has been applied. Exceptions to this rule are stock prices and market capitalisation, which applies current prevailing exchange rate. All values are estimated in nominal terms. Further, it should be noted by the reader that the numbers used in this text are formatted using period (.) as thousand separator and comma (,) as decimal separator. Is assumed that the reader of this thesis is familiar with general economic and finance theory and terminology. With that said, there is one exception the authors deem necessary to elaborate on. The thesis will use the term 'globalisation' with respect to different perspectives. The term refers to both the macroeconomic perspective (the increase of integration of and interdependency between countries) and the microeconomic perspective (firms focusing on the world market).

Abbreviations are applied in this thesis due to the frequent use of company names and theoretical terms. Whenever an abbreviation is used, the full term is presented initially followed by the abbreviation in brackets. Lastly, content footnotes are used to for explanatory purposes and to comment on a designated part of the text. These are placed at the bottom of the page.

2 Methodology

2.1 Research design

The research design is the general plan of how the research question will be answered. It includes portraying the research philosophy, approaches and specifying the sources from which data is intended to be collected. Further, it also describes the processes that turns the research question into a research project and presents an evaluation on important issues in academic research; the validity, reliability and generalisability. Finally, it wraps up with a discussion on the limitations given the chosen research method.

2.1.1 Scientific View

As with most research, the purpose of this thesis is to develop new knowledge – though with a modest ambition of solving a specific problem – based on a phenomena observed in reality. From a research perspective, the phenomena observed can be characterised by the concept of paradigms from which understandings and explanations of the reality can be gained and attempted. There are various research philosophies, approaches, strategies, and methods used to tackle a research project and the development of knowledge. Understanding and choosing each of these aspects is important in the quest for finding an answer to the research question. Each of the possible choices provide structure, guidance and possible limitations to following decisions and ultimately the way a researcher can collect and analyse data to create valid findings (Saunders, Lewis, & Thornhill, 2009). Guba and Lincoln (1994) argue that deciding the basic belief system or world view (paradigms) is superior to deciding on questions of research methods, as this guides the investigation not only in the choice of method but in ontologically and epistemologically fundamental ways. As such, designing the appropriate research design can be viewed as a process of going through different layers that are surrounded by an outer layer of philosophies.

The outer layer consists of epistemology, ontology, and axiology. These terms relate to development of knowledge, what knowledge is and the nature of knowledge (Saunders et al., 2009). Additionally, these research philosophies underpin different paradigms and following assumptions that will guide the research strategy and the methods chosen. The adopted philosophy will have practical implications, where the main influence is the view of relationship between knowledge and the process by which is it developed (Saunders et al., 2009). *Ontology* is concerned with nature of reality and assesses the difference between reality and the perception of reality, whereas epistemology is concerned with what constitutes acceptable knowledge in a field of study. The latter is a commonly used in scientific research as it searches for facts and information that can be verified objectively and establish acceptable knowledge thereafter. Finally, axiology is concerned with the researchers own values and how they play in all stages of the research process. However, as Saunder et al. (2009) recognise, the practical reality is that a particular research question rarely fits perfect with one philosophical domain. This is supported by Tashakkori and Teddlie (1998), who suggests that it is more appropriate to think of the philosophy adopted as a continuum rather than opposite positions.

Given the multiple aspects of this thesis (describing, explaining, understanding, analysing and concluding), the process involves utilising knowledge from a range of disciplines and methods, which in conjunction form insights that cannot be obtained through all of these disciplines separately. Thus, a pragmatic philosophy is deemed as the most appropriate view since it allows for a research design where the most important consideration is the research question and the possibility to work with variations in the epistemology and ontology philosophies. This is based on the fact that the research question does not unambiguously suggest that either, for example, a positivist or objectivist philosophy is adopted. This leads to the subsequent layer which includes different philosophical stances (paradigms) associated with the philosophies.

To elaborate, paradigms commonly associated to work under the ontological worldview are objectivism and subjectivism (or constructionism). The central dogma of the objectivistic paradigm is the recognition that social phenomena and their meanings exists separately (or independently) to social actors. Opposite to objectivism is subjectivism, which argues that social phenomenon is actually constructed by social actors (Saunders et al., 2009). Further, knowledge creation is a continual process, which means that through the process of social interaction these phenomena are in constant state of revision. As a result, subjectivism is based on the acceptance of multiple realities which implies new knowledge can be derived from specific examples, say a case study.

Further, positivism, interpretivism, and realism are philosophical positions associated with the epistemological philosophy. Positivism refers to the philosophical stance of natural scientist research in the way that hypotheses are generated and tested, which allows for explanations that are measured against accepted knowledge of the reality. Thus, the positivism paradigm has an objectivistic relation to reality and emphasises quantifiable results leading to further development of theory which then may be tested by further research (Saunders et al., 2009). Like positivism, the realism philosophy is a branch of epistemology that assumes a scientific approach to the development of knowledge. Interpretivism on the other hand argue that insights are lost if complexity is reduced to law-like generalisations, as positivism suggest. The interpretive view advocates that it is necessary for researchers to understand differences between humans in the role as social actors to seek new knowledge (Saunders et al., 2009).

This thesis does not reflect a strict objective worldview nor is driven by hypothesis testing or intend to test and verify established theory, hence the positivistic and realistic attitude towards knowledge conflicts the research aim of this thesis. Moreover, this research does not attempt to understand or investigate subjective meanings or social phenomena between social actors. The interpretivistic perspective is therefore excluded based on, though acknowledging that expectations of the future in this context are constructed by humans, how different perspectives between individuals affect these expectations is not the purpose of this study. Nonetheless, there are some features of this study that are characterised by both objectivity and a

singular reality and others that are subjective and allows for multiple realities to be understood. Therefore, as pragmatism argues, both observable phenomena and subjective meanings can provide acceptable knowledge. The knowledge is generated through a focus on practical applied research, which integrates different perspectives to help interpret data based on secondary sources and existing theories. This relates to the view of paradigms as a continuum rather than opposite positions, with the assumption that the integration of qualitative and quantitative traditions within the same study can be seen as complementary to each other. This assumption is supported by Greene and Caracelli (2003), who contend that a mixed method approach should be applied if it generates the best supportive evidence to draw conclusions and make decisions.

2.1.2 Research Approach

The nature of the research question is best pursued applying a case study strategy, as it provides tools for studying contemporary complex phenomena within its real life context using multiple sources of evidence (Saunders et al., 2009). According to Yin (2013) there are four different case strategies based upon two discrete dimensions: single versus multiple case and holistic versus embedded case. The case strategy employed in this study involves a single holistic case study. This implies the use of a single case (Volvo) with the valuation and strategy for the organisation as a whole, opposed to a strategy that employs multiple cases which examines sub-units within the organisation (multiple embedded case study).

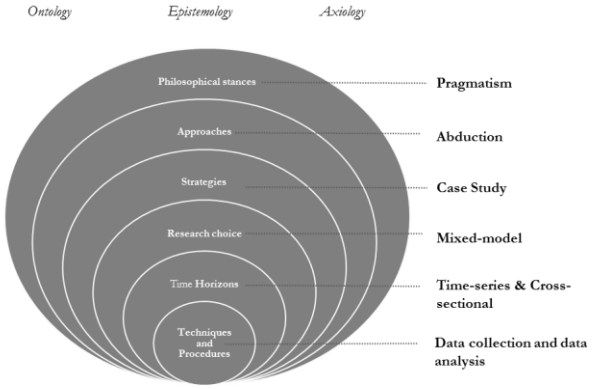
Given the "why", "what" and "how" aspects of the research question this strategy fit best with the methodology, as proposed by Yin (2013). Moreover, the case study strategy is also chosen based on its ability to gain a rich understanding of the context of the research and the process being enacted (Morris and Wood, 1991). It follows that the focus of the thesis is of exploratory nature that utilise existing theory in a contemporary specific context. The study involves flexibility and allows for change of direction as results of the data and analyses appears. This is in line with what Yin (2013) presents as an application of the case study model, namely to explore those situations in which the intervention being evaluated has no clear set of outcomes.

Moreover, this strategy provides the possibility to triangulate multiple sources of data, including combining quantitative and qualitative work (mixed methods). Tashakkory and Teddlie (1998) argue that mixed methods are useful if it provides better opportunities to answer the research question and better evaluate the extent to which the research findings can be trusted and inferences made from them. More specifically, this thesis will apply a mixed-model research, meaning the combination of quantitative and qualitative data collection and analysis procedures, as well as combining quantitative and qualitative approaches at other phases of the research (Saunders et al., 2009). This is well in line with the preceding discussion on the 'what' and 'how' of the knowledge generated and considered in this thesis, as well as the subjectivistic world view.

Generally, research adheres to either qualitative or a quantitative method. The former is often characterised by interpretivism and adopts an inductive process were the research attempts to develop theory through empirical observations. The latter is typically used when the research is characterised by a positivistic paradigm and the objective stance to knowledge, where a deductive process is applied through hypotheses testing (Saunders et al., 2009). Given the nature of the research question, the difficulties of defining the research with discrete measures, and the integration of qualitative and quantitative segments characterised by both deduction and induction argues for a third process. According to Dubios and Gadde (2002) the abductive process allows for a continuous interplay between theory and empirical observations and is considered fruitful if the research objective is of exploratory characteristic. The abductive approach is the most suitable approach as the authors do not challenge existing theories or methods nor aim to generate new theory, but rather utilise established theories to analyse case specific data from which a most likely result is derived.

Designing the most appropriate research approached was previously described as a process of going through different layers. Therefore, to sum up this section, figure 3 illustrates an overview of the applied research design.

Figure 3. Research design



Source: Adopted from Saunders, Lewis & Thornhill (2009)

2.1.3 Collection of data and Criticism of the data sources

The data collected in this thesis is both of quantitative and qualitative nature, is exclusively gathered from publicly available information in the form of secondary sources. The quantitative data has been primarily collected from sources that provide financial information services, such as, Bloomberg, Thomson One database and MarketLine. These are widely used and accepted financial data providers, and access to these databases is provided by Copenhagen Business School, which gives the authors no reason to question the credibility and reliably of these data sources. For consistency, all the market data of the publicly traded peers have been collected from the same database (Bloomberg).

The exception to this is the case company, which is not publicly traded and therefore, all data is collected from Volvo Cars AB's annual reports and company announcements. Important to note is that information in annual reports have been used and interpreted with caution, as information regarding future expectations and evaluation of business performance is possibly biased. Further, quantitative data has also been gathered from other secondary sources, such as industry associations, market research companies, national statistical bureaus, and international databases such as the World Bank. In addition to this, qualitative data is gathered from written documents such as journals, newspaper articles, and organisations' communications or websites.

An overall concern of the secondary data collected is that it was not primarily made for the purpose of this thesis. Therefore, interpretations of the same data can vary and different conclusion can be reached. However, the gathering and integration of qualitative and quantitative from multiple sources applied in this case study facilitates reaching a holistic understanding of the phenomenon that is examined. The theoretical base of this thesis built on academic literature. A variety of literature, in the form of books (within the scope of the subject) is include to provide different perspectives from different authors to obtain as broad a theoretical basis as possible.

2.1.4 Validity and Credibility

An evident issue of this study is that, especially when it comes to the credibility, some aspects of this study cannot be tested because the study is not primarily built on statistical inference but rather analytical inference. Instead, the credibility of this study is characterised by what Strauss and Corbin (1990) calls logical coherence, which has to do with the adequacy of the research process. As such, details and information are provided consistently so that readers can assess the adequacy of the research procedure and its outcomes. As Dubios and Gadde (2002) puts it, logical coherence as a foundation for analytical generalisation is an important criterion for quality in case research. Further, it is acknowledged that interpretations will play a role in analysing data and results in order to make context-specific conclusions, which might reduce the validity. For this reason, the theoretical frameworks applied in this study are well-established frameworks both among academics and practitioners. Moreover, according to Yin (2013) the validity is increased by the triangulation of data sources and the comparison of this data enhances data quality based on the idea of convergence and the confirmation of findings. Conclusively, however apparent, there is limited generalisability to this study. Yet, some findings described in this study will be comparable to the findings of other researchers within similar situations and contexts.

2.1.5 Limitations of the Research Design

The case study as a strategy has not always been considered as a proper scientific research method, where the main argument has been its limitations in providing a basis for scientific generalisation (Yin, 2013). For example, the limitations of employing a single case strategy is the lack of possibility to establish

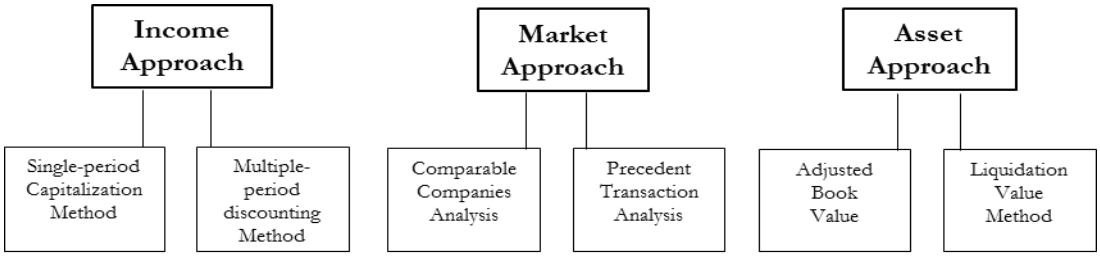
whether the findings of the case are generalizable, contrasted to using multiples cases which can illustrate whether the findings of the first case occur in other cases. On the other hand, the purpose of this thesis is to gain insights and understandings of a particular situation or phenomenon, not to build theory or rigorously test existing theories.

The case itself plays a supportive role and facilitates the understanding of the particular situation. As the process of valuation is focused at valuing one specific project or company at the time, undertaking a strict quantitative or qualitative approach would not be valuable given the intentions for this study. As Dubious and Gadde (2002) so agreeably summarise it; learning is the essence of all research. The knowledge in this study is generated through combination of theoretical frameworks with a matching case, and the continuous interplay between search and discovery. Despite the strategy's academic shortcomings, the authors believe that a case study will yield the most valuable in-depth insights to the theories and frameworks related to the subject.

2.2 Theoretical Framework

In general, there are three approaches to valuation: the income approach, market approach, and asset approach. Figure 4 show how a broad categorising of the valuation methods within these three approaches[1]. The first translates to a discounted cash flow valuation (DCF), the second a relative valuation, and the third uses the current value of a company's tangible net assets as the key determinant of fair market value (Damodaran A. , Investment valuation: Tools and techniques for determining the value of any asset, 2012).

Figure 4. Business valuation approaches



Source: Adopted from Evans & Mellen (2010). Own depiction

The estimated value of Volvo Cars AB will be based on an enterprise valuation model. The approach is based on the thoughts of the two Nobel laureates, Franco Modigliani and Merton Miller, namely that the value of a company's economic assets must equal the value of the claims against those assets (Modigliani & Miller, 1958). Therefore, enterprise value (EV) include both the estimated market value of equity and the

[1] Important to note that this is not meant to be an exhaustive list. Within the three approaches there are others methods as well. For example, under the Income Approach the contingent claim valuation or 'real options exist, which uses option pricing models to measure the value of an asset that share option characteristics.

estimated market value of net interest bearing debt (NIBD), which is equivalent to the market value of its operations.

To derive this value, this thesis focus on the primary valuation methodologies used by both academics and practitioners, to determine valuation for private companies on a stand-alone basis and within the context of M&A transactions, IPOs, and investment decisions (Damodaran, 2012; Koller, Goedhart, & Wessels 2005; Evans & Mellen, 2010; Petersen & Plenborg, 2012; Pearl & Rosenbaum, 2013). These methodologies are represented by the discounted cash flow (DCF) analysis and comparable companies analysis. In addition, due to the benefits and the increased popularity of the economic value added (EVA) approach, which is a cash flow approach that yields identical results as the DCF, this will be included (Koller et al., 2005). The cash flow approach is a widely adopted by practitioners and recommended by the finance literature as it is considered an objective outcome (rather than accrual-based performance measures) that cannot be manipulated (Petersen & Plenborg, 2012). As a way of testing the validity and accuracy of these value estimates**,** the market-based valuation is applied. This method is a relative valuation models, where the value is based on various pricing multiplies derived from the market of similar companies.

To accurately measure value and assess how the company creates value, financial statement and strategic analysis methods will be applied. This includes analysing both the company's performance and the competitive environment in which the company operates. A strategic analysis supports the financial statement analysis in the sense that the process goes beyond the results of company and highlights the causes of its success. As such, this analysis supports the valuation substantially. The achievement of a company depend on numerous external and internal factors that must be asses as part of the valuation process (Evans & Mellen, 2010). To assess the competitive environment and the company's strategic position and ability to compete in the market, this thesis utilises Porter's Five Forces, PEST, VRIO, and SWOT. These frameworks are well recognised and established frameworks, both among academics and practitioners (Petersen & Plenborg; Evans & Mellen, 2010; Grant, 2013). The former two is used to analyse the external environment, whereas VRIO is used to analyse internal factors, and SWOT can be viewed as a combination of the two that presents the factors that influence the performance of a company.

PART I: THE CASE COMPANY

This part will create a picture of what the company is and what it aims to be. The first section is devoted to the history of Volvo followed by organisation, strategy, products, sales and finally governance. This will lead to a comprehensive understanding of the company which will make the basis for determining comparable companies as well as the company's strategic and economic outlook.

3 Volvo Cars AB

3.1 History

Volvo was founded by Assar Gabrielsson and Gustaf Larson in the mid 1920's based on the idea that no one was making a car that was strong or safe enough for Swedish roads. As a result of the partnership, the first Volvo automobile rolled out of the Gothenburg manufacturing plant in 1927, the same plant where several of today's models are produced. The founders also stated the famous quote "cars are driven by people", which since then has been central to how Volvo conduct business. This has led to a clear focus on safety and sustainability and the company's research and development (R&D) department have brought a range of important innovations to the market and thereafter waived the patent rights for the world to benefit. The most notable safety innovations that Volvo has managed this way is the three-point seat belt in 1959, the rear-facing child safety seat and the child booster cushion in 1976. In terms of sustainability, Volvo invented the lambdasonde in 1976, a probe that manufacturers install as part of the exhaustion system which reduce harmful emissions by up to 90%. Via these types of innovations Volvo has been able to build a reputation of being one of the safest and most environmentally friendly auto manufacturers in the world (Volvo, 2017a).

In 1999 Volvo Group sold Volvo to Ford Motor Company (Ford) for $6.45bn, starting a new more troublesome period in the automobile manufacturers history and after 11 years of American ownership the company got acquired by the Chinese auto manufacturer Geely for $1.8bn, resulting in a 72% loss on the deal for Ford (BBC News, 1999; Yan & Leung, 2010). However, under Chinese ownership, Volvo has seen tremendous growth and gone from 373.500 vehicles sold in 2010 to 534,332 in 2016 (Volvo Cars, 2015; Volvo Cars, 2010)

3.2 Organisation

Volvo Car AB, the Swedish holding company, is owned by Shanghai Geely Zhaoyuan International Investment Company Ltd., which in turn is ultimately owned by Zhejiang Geely Holding Group Ltd and is controlled by the Chinese citizen Li Shufu. It is operated as an independent entity with headquarters in Gothenburg, Sweden. Volvo Car AB, referred to as Volvo or the company, does not conduct any form of direct business other than being the holding company of the Volvo Car Corporation, sales companies, industrial entities and other subsidiaries. The company has a global presence with sales in over 100 countries

and industrial facilities in Sweden, Belgium, Malaysia and China and are currently building a new plant in South Carolina. In 2015, the group made a common control transaction where Volvo acquired several Chinese industrial entities from the Chinese parent company with the motivation to decrease the groups legislative complexity and to ensure growth in the Chinese market (Volvo Cars, 2015). The groups operations are organised according to standard corporate functions with a member of the executive management team responsible for each function, such as IT, marketing, and design. The sales organisation is managed according to the geographical regions Asia-Pacific, EMEA and Americas (Volvo Cars, 2015).

3.3 Strategy

Volvo's vision is to become "The world's most progressive and desired premium car brand" and in order to achieve the vision the company have formulated the mission; "our global success will be driven by making life less complicated for people, while strengthening our commitment to safety, quality and the environment". The vision and mission are clearly formulated to leverage the company's history whist emphasising the transition into becoming a premium car manufacturer. This pivot was initiated when Geely purchased Volvo in 2010 by clearly formulating two phases of a strategic transformation. The aim of the initial phase was to build a strong foundation by 2015, and phase two was formulated to give guidance on how to capitalise and execute going forward (Volvo Cars, 2015).

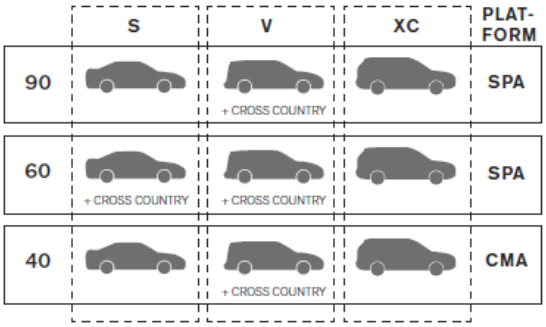
The central part of phase one include to create a more flexible manufacturing architecture by developing new platforms and engines making the company independent of outside technologies as well as changing the company structure so that Volvo can fully operate and function as a stand-alone organisation. The company has also aimed to increase the customer focus by developing new ways to market through a digital sales platform as well as introducing new product designs more appealing to the premium segment. In addition to the previously expressed focus areas, the company has had a focus on globalisation of the organisation, establishing production facilities on all major markets, as well as technological innovation (Volvo Cars, 2015).

The company initiated phase two in 2016, introducing a bigger focus on capitalising on the foundation that was set up in phase one by increasing the focus on margin management. This included the continuous preparation for the future in terms of increasing the economies of scale through the creation of smarter modular products that can be used in more models as well as innovating around electrification, autonomous drive and connectivity. Additionally, the company will continue to leverage the three home markets by increasing their commercial, industrial and R&D presence through further expansion of the organisation (Volvo Cars, 2015).

3.4 Products

Volvo product portfolio consist of premium vehicle models of a wide range; sport utility vehicles (SUV), estate, and sedan. Figure 5 displays a complete view of the product portfolio, clustered by a model range (40, 60, 90) and the three body types S (Sedan), V (Estate), and XC (SUV). The 40-model range is a smaller car (compact car); the 60-range is a mid-size car; and 90-range full size car. For each model the company offers variants such as R-design, Inscription, Cross Country, and Long Wheelbase all of which differ in terms of driving experience and exterior styling. The fleet consist of both petrol and diesel driven engines. In addition, the XC90 and V60 are also models that are offered within the plug-in hybrid range (combination of an electric motor and a petrol- or diesel engine). The core design of the products is characterised by attention to premium factors through Scandinavian design philosophy and living, focusing on functionality and high quality materials.

Figure 5. Volvo cars product portfolio



Source: Volvo Cars Annual Report 2015

The new XC90 and S90 were the first products launched with the new product development platforms, Scalable Product Architecture (SPA) and Compact Modular Architecture (CMA). The new platforms allow for a wide range of flexibility, stretching from design and proportions to technological features such as drivability, safety, connectivity, and interior space. According to the company, the new platforms pave the way for a new design philosophy with certain signature design elements, such as lights and interior. Since its launch, the all-new XC90 was credited one of the most prestigious design awards in the world, Red Dot Design 'Best of the Best' Product Design Award (Red Dot, 2015). The platforms are said to be one of the cornerstones in the company's product strategy and is set out to renew Volvo's entire fleet of vehicles by 2019. The renewal plan also includes discontinuing models, where the V70 and XC70 were phased out during 2016 while the S90/S90L and V90/V90 Cross Country were introduced to the market.

Table 1. Retail sales by model (units)

Model	Full Year 2016	Full Year 2015
XC60	161.092	159.617
V40/V40 Cross Country	101.380	106.631
XC90 (All-new)	91.522	40.621
S60/S60L/S60 Cross Country	61.941	64.078
V60/V60 Cross Country	60.637	61.341
XC70	23.714	30.175
V70	14.888	27.841
V90/V90 Cross Country	7.674	—
S90/S90L	7.383	—
S80/S80L	3.172	10.330
XC90 (Classic)	927	2.481
Other	2	12
Total	**534.332**	**503.127**

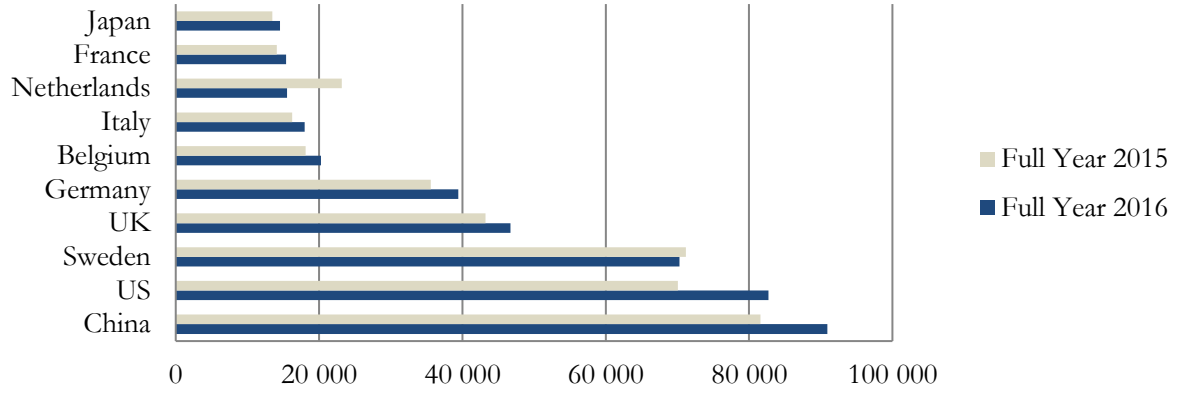
Source: Volvo Financial Report 2016, own depiction

As seen in table 1, Volvo reported a retail sales record of 534.332 (503.127) units sold in 2016, an increase of 6.2% and the third consecutive year of record sales for the company years. In terms of sales by model the XC60 remained the most popular model during 2016 with 161.092 units sold. The second best-selling car line was the V40/V40 Cross Country, and together with the all-new XC90 mainly the three models drive the sales increase.

3.5 Sales

The company has a global presence with sales in over 100 countries, with three home markets: Sweden, the US, and China. Moreover, the company segments the sales into two additional categories labelled as "Western Europe (excl. Sweden)" and "Other markets". Western Europe consist of key markets, such as UK, Italy, Belgium, Netherlands, France, and Spain while Other Markets include for example, Russia, Japan, Canada, and Poland.

Figure 6. Top 10 retail sales by market (units)



Source: Volvo Financial Report 2016, own depiction

Figure 6 depicts the sales segmented by the different markets. In 2016, Western Europe accounted for roughly 40 per cent of total sales while the other markets accounted for a fairly even share. This sales distribution has been steady over the last couple of years. Table 2 shows that the increase of sales during 2016 was mainly supported by a strong growth in two of Volvo's home markets, the US and China, growing 18,1% and 11,5% respectively. Western Europe region grew by 4,1%, Sweden decreased by 1,3% and Other Markets increased 2,5%.

Table 2. Retail sales by region

Retail Sales (units)	Full Year 2016	Full Year 2015	Change	Retail Sales by market (2016)
Western Europe (excl. Sweden)	206.144	198.049	4,1%	39%
China	90.930	81.588	11,5%	17%
U.S.	82.726	70.047	18,1%	15%
Sweden	70.268	71.200	-1,3%	13%
Other Markets	84.264	82.243	2,5%	16%
Total	**534.332**	**503.127**	**6,2%**	**100,0%**

Source: Volvo Financial Report 2016, own depiction

Western Europe. Over the last couple of years, Western European passenger sales have continued to grow at steady pace mainly driven by positive economic development in major markets. Key markets, such as UK, Germany, Belgium and Italy, showed strong new-car sales. The XC60 was the best-selling model further supported by the all-new XC90.

China. Car sales increased substantially during 2016, mainly attributed to the government's purchase tax cut on tax on small-engine/cars and a continued strong demand for SUV's and compact crossovers. The XC60 was the best-selling model with sales, followed by the S60L. In addition, the XC90 contributed to the strong volume growth. For the full year, the region grew by 11,5%.

US. Demand for SUV and compact crossover remained strong. For the full year, the company sold 82.726, a substantial growth of 18,1% from precedent year. The growth mainly attributed to the all-new XC90.

Sweden. Due to the discontinuation of models, total sales for the region took the year took a step backwards and decreased 1,3%. Despite this, Volvo holds a strong position on the Swedish passenger car market. The XC60 was the best-selling model followed by the V90/ XC90. The company managed to claim the throne once again of the best-selling model in Sweden after the launch of V90/S90, a placing the company lost to Volkswagen (VW) Golf for the first time since 1962 (DI, 2017).

Other Markets. Demand remained strong in several Other European and Japan while Russia displayed a weaker trend. The XC60 and the V40/ V40 Cross Country were the most popular models, while the XC90 showed a supporting volume with 18.270 units sold. Overall the market grew by 2,5%.

3.6 Governance

Volvo Cars is a privately-owned company and therefore not obliged to follow a corporate governance code as publicly listed companies do. However, the company has repeatedly stated that it intends to report information as if it were publicly traded and have chosen to follow "relevant" parts of the Swedish code of corporate governance (the code) on top of the regulations set by the Swedish companies act and Swedish annual accounts act. Therefore, the code will be applied as means for comparison, whilst acknowledging that some parts of the code is irrelevant for private companies. In 2016 the company raised approximately 7,6 billion SEK in debt and issued preferred shares for 5 billion SEK to three Swedish institutional investors (AMF, Folksam and AP1), thus increasing the number of both shareholders and stakeholders.

In line with the code, the highest decision making body is the shareholders meeting who, amongst other tasks, elect a nomination committee who in turn nominate members to the board of directors (BoD). The company's board of directors consists of 13 members including three union representatives, the CEO Håkan Samuelsson and four members that are both independent of the majority shareholder and executive management (Volvo Cars, 2015). In recent years several new members have been appointed to the BoD, most notably former SKF CEO, Tom Johnstone and IT entrepreneur Betsy Atkins. The code stipulates a majority of the directors to be independent, but since it is a privately owned company and the majority owner has full control over the shareholders meeting, this is one of the examples why some parts of the code is abundant in the case of Volvo. The BoD has created special committees for auditing, people and compensation as well as for product strategy and investment. The reason for creating special committees is to increase the BoD's knowledge base for decision-making within some key organisational issues (Volvo Cars, 2015).

The overall assessment is that the company is managed on a very professional level. Further, the fact that Volvo aim to report as if they were listed is expected to decrease the difficulties of accessing information that is vital for valuation purposes.

PART II: DEFINING THE INDUSTRY AND PEERS

This part will narrow down the broad term 'automotive industry' and based on that distinction present Volvo's peers. Firstly, the section defines the relevant industry for the purpose of this analysis and secondly defines the segments within the industry. Finally, it provides a holistic description for determining comparable companies ("comps"). The comps will be determined by shared key parameters. The most similar companies will then form the peer group that will be applied for benchmarking and valuation purposes.

4 The Automotive Industry: Cars

The automotive industry is generally defined to comprise all companies that manufacture trucks, busses, motorcycles, commercial cars and passenger cars (Encyclopedia of Global Industries, 2011). Volvo solely produce and market cars, hence the focus throughout this study will be on car manufacturers – also referred to as auto manufactures (AMSs). In line with market researchers and data, this thesis defines the car markets by the initial retail sale/registration of new passenger cars, opposed to the manufacturing of cars (also defined as automobile market). The markets include sedans, compact cars, SUVs, estates, and other related vehicles comprising no more than eight seats in addition to the driver's seat and used for the purpose of transporting passengers (MarketLine 2016a; OICA, 2017a). Moreover, the market value is calculated at retail selling price and the market volume is given in terms of units sold.

4.1 Segments

AMs target different market segments by both offering different models based on buyer characteristics and the overall quality and price of that product line. One example of model based segmentation is seen in the previous section on Volvo's product portfolio, which offers a whole range of cars from compact vehicles to larger estate type vehicles and SUV's, targeting buyers with different needs. This type of segmentation is very typical for the automobile industry and most manufacturers offer similar type product ranges. As a means of differentiation, manufacturers tend to position themselves in different price segments, thus creating what this thesis will denominate as a value, premium and luxury segment. According this definition, products in the value segment are characterized by a low price and quality, the premium segment higher price and quality and luxury type cars by luxury features and very high price.

It is not uncommon for participants to own brands that target different segments. Volkswagen is an example of a company that competes in multiple segments with different brands, with Škoda and Seat in the value segment, Audi and VW in the premium segment and Bentley, Porsche and Lamborghini in the luxury segment (Volkswagen, 2015). The equation is naturally more complex than functional forms of value such as quality and cost value in terms of price. Experiential and symbolic type values such as emotional attachment to brands, image, prestige and exclusivity play a crucial role in the value proposition (Smith & Colgate, 2007). These values are very important in positioning a brand within a given price segment due it

its effect on customer perception of what the product is, and therefore the price that the company can charge.

5 Peer Group

A peer group must be created in order to analyse a private company and establish a valuation using comparable companies. Pearl and Rosenbaum (2013) presents a framework for finding comps. This framework is in line with what Koller et al. (2005) describes as "best practices" for finding comps and to apply multiples properly. The starting point is gathering a broad overview of the public vehicles manufacturing companies in the automobile industry. The group is then narrowed down to those that share similar core characteristics, following the framework as displayed in Table 3. After identifying all potential comps, a screening based on the business profile and strategic outlook will be performed. Following, an additional screening on the companies' financial profiles will be performed.

Table 3. Peer group framework

Business Profile	Financial Profile
◆ Sector	◆ Size
◆ Products & Services	◆ Profitability
◆ Customers and End Markets	◆ Growth Profile
◆ Distribution Channels	◆ Return on Investment
◆ Geography	◆ Credit Profile

Source: Adopted from Pearl & Rosenbaum (2013).

The selection of best comps is dependent on gaining a sound understanding of the target company, a process which is especially challenging for private companies as it is often difficult to find basic company data. Despite Volvo being a private company, the company has provided financial and other information over the last couple of years at a sufficient level for this analysis.

Part I: Business Profile Analysis

The business profile serves as the initial screening stage, applied on public companies in the same sector. The early universe of companies is collected using financial information services, advised peers and by browsing through similar car manufacturers' financial reports, searching what they define as competitors including Volvo's. In addition, SIC codes[2] are used to screen for companies that operate in the same sector. Table 4 show the comparables identified through the process described above.

Products & Services. The companies included in the initial peer group are all identified as automobile manufacturers but the majority of the companies also offer related products and services such as

[2] Standard Industrial Classification (SIC) is a system established by the U.S. government for classifying the major business operations of a company with a numeric code. Source: Pearl & Rosenbaum (2013).

motorcycles, trucks and financial services. The extent of which these related products and services contribute to revenues and therefore differ from Volvo's pure-play business model vary amongst the identified companies. As seen in table 4, Daimler, Peugeot and Honda are the companies in the group with the least proportion of revenues from automobiles suggesting that there might be substantial differences in business opportunities and value drivers as compared to Volvo. Further, the AMs are categorised according to targeted segment. This entails that the premium manufacturers are expected to use higher quality inputs and sell at a higher price. However, the production process is arguably similar and the purpose of the vehicle the same.

Table 4. Initial peer group

Company	SIC code	Sub-sector	Products			Services	Geography
			Automobiles	Motorcycles	Trucks & Other*	Financial	
Volvo Cars AB	*3711*	*Automobiles*	*100%*	-	-	-	*Europe*
Premium Segment							
Daimler AG	3711	Automobiles	64%	-	24%	12%	Europe
Bayerische Motoren Werke AG	3711	Automobiles	74%	2%	-	24%	Europe
Audi AG	3711	Automobiles	99%	1%	-	-	Europe
Value Segment							
Ford Motor Company	3711	Automobiles	93%	-	-	7%	North America
General Motors Company	3711	Automobiles	94%	-	-	6%	North America
Fiat Chrysler Automobiles	3711	Automobiles	91%	-	9%	-	North America
Peugeot S.A	3711	Automobiles	67%	-	30%	3%	Europe
Renault SA	3711	Automobiles	96%	-		4%	Europe
Volkswagen AG	3711	Automobiles	74%	-	14%	13%	Europe
KIA Motors Corporation	3711	Automobiles	n.a	n.a	n.a	n.a	Asia-Pacific & North America
Toyota Motor Corporation	3711	Automobiles	91%	-	2%	7%	Asia-Pacific & North America
Mazda Motor Corporation	3711	Automobiles	n.a	n.a	n.a	n.a	Asia-Pacific & North America
Honda Motor Co., Ltd	3711	Automobiles	73%	12%	2%	13%	Asia-Pacific
Hyundai Motor Company	3711	Automobiles	78%	-	7%	15%	Asia-Pacific
Nissan Motor Co., Ltd.	3711	Automobiles	n.a	n.a	n.a	n.a	Asia-Pacific

*Other include commercial vehicles, components, automotive equipment and other activities

Source: Own construction using data from Thomson Reuters, Bloomberg and company filings

Customers and End Markets. The degree to which the companies in the initial peer group target different customers and end markets is important for valuation purposes as it affects the fundamental economic drivers, future outlook and profitability. Table 4 reveals that most players operate in multiple business areas, which makes this analysis vital in the ability to only include companies that sufficiently reflect Volvo's business. The most common additional business for the peer group companies to engage in is financial services. However, this business almost exclusively targets the customers of other business areas by offering financing opportunities for customers to the automotive business (BMW, 2017).

However, when considering trucks the end customer is arguably different as they are bought by companies for business purposes, which likely create differences in value drivers and future prospects as market forces differ. The same applies for companies with large parts of its revenue being generated from automotive parts, for example as Peugeot with its customers mainly being other AMs (PSA Group, 2015). Therefore, the appropriateness of using Daimler and Peugeot decreases. Since Volvo is actively targeting the premium

segment it would increase the appropriateness of including the premium AMs in the final peer group. However, as outlined in the segmentation section, most AMs operate several brands targeting different segments. Further, it is not possible to conclude that the customers are widely different as the product ranges are very wide. As such, the dimension should be seen as continuous rather than binary. With this in mind, the players in the lower parts of the value segment, such as Honda, are considered less appropriate comparable company.

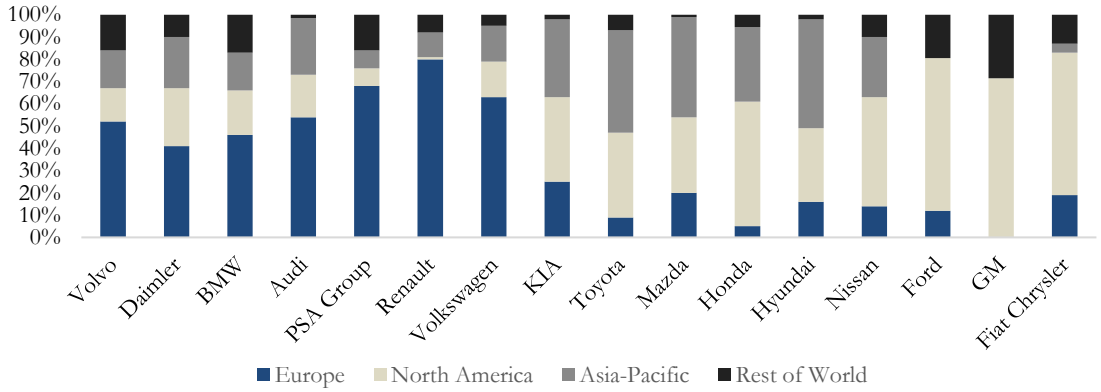
Distribution Channels. Considering the geographical dispersion (defined as where they are based and majority sales), there are geographical regulatory differences regarding the avenues through which a company can sell its products to the end user. In North America, though the law varies by state, a majority of the states prohibits direct sales to customers (NADA, 2017). Whilst German and Swedish regulation allows for company-owned stores and Volvo has for example, experimented with factory-direct sales over the internet in Belgium. However, in virtually every other country in the world direct sales are the exception; in Russia, France, China, and the UK car companies have chosen the independent franchise system. As a result, across the group displayed in table 4, the companies use similar distribution networks, that is the existing AM/dealer franchise system. As such, it is concluded that the companies share key drivers of operating strategy and performance.

Geography. As illustrated in table 4, the companies are dispersed geographically and could therefore potentially differ substantially in terms of fundamental business drivers and characteristics. The differences arise from local demographics, economic drivers, regulatory regimes, consumer buying patterns and preferences, and cultural norms. Consequently, Pearl and Rosenbaum (2013) mentions aspects that are affected, such as, growth rates, macroeconomic environment, competitive dynamics, paths-to-market, and potential opportunities and risks. Other factors that contribute to these differences include local capital markets conditions as well as political risk, and as a result there are often valuation disparities for similar companies in different global regions (Pearl & Rosenbaum, 2013). In such instance, it is suggested that when determining comparable companies, it is useful to group companies in a separate category from geographic-based companies even if their basic business models are similar. As such, the companies are classified as European, North American or Asian-Pacific.

Figure 7 show the classification of revenues for each company segmented according to region and benchmarked against Volvo's geographical revenue segmentation. Through this separation, a clear characteristic is that companies tend to realise the largest proportion of their revenue in their respective home market. As argued by Hedley (2007), consumer behaviour in the western countries are very similar, whereas there are major differences as compared to the eastern societies. Further, as shown in the section 6.1.1, economic prospects follow the same pattern. Considering that Volvo has the majority of its revenues from Europe it increases the similarities to its European and American peers whereas wider differences are

expected relative to the Asian-Pacific players. With regards to this, Asian-Pacific companies that stand out are Toyota, Mazda and Hyundai. Hyundai doe not only generate the majority of its sales in the Asia-Pacific region, but over 40% of total sales is generated in South Korea (Hyundai, 2016).

Figure 7. Geographic segmentation of revenues



Source: Own construction using data from Thomson Reuters, Bloomberg and company filings

Additional Factors. In addition to the business profile, cross-ownership is highly common in the automobile industry. This needs to be accounted for as companies that in realty operate as subsidiaries likely reap economic benefits that is not possible to account for by adjusting accounting statements. This is the case for Audi who is owned to 99,5% by Volkswagen, KIA who is owned to 33% by Hyundai and Nissan who is owned to 43,4% by Renault (Volkswagen 2015; Hyundai 2016; Renault 2015).

Business Profile Conclusion. Based on the analysis it is deemed that sufficient information has been gathered to exclude certain companies from the peer group due to differences in business profiles that makes them unlikely to adequately reflect Volvo's profitability, opportunities and future prospects. These companies are Peugeot, Honda, Hyundai, Audi, KIA and Nissan. The companies that will be subject to the financial analysis before setting the final peer group are Daimler, Volkswagen, BMW, Renault, GM, Ford, Fiat Chrysler, Toyota and Mazda.

Part II: Financial Analysis

The next step is examining key financial characteristics in order identify the best comparable companies and focus primarily on the last twelve months (LTM) financial data. The analysis includes calculation of key financial statistics, ratios, and other metrics in accordance with the financial profile framework and is illustrated in table 5. All companies accounting statements are adjusted in accordance with the framework outlined in section 8.2.

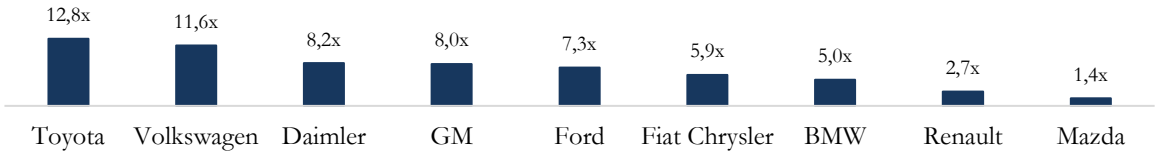
Table 5. Financial characteristics framework

Size	Profitability	Growth Profile	Return on Investment	Credit Profile
Enterprise Value	Gross Profit	Historical growth rate	ROIC	Leverage ratios
EBITDA	EBITDA margin	Estimated growth rate	ROE	Coverage ratios
EBIT	EBIT margin		ROA	Credit ratings
Net income	Net Income margin			
Revenues				

Source: (Pearl & Rosenbaum, 2013)

Size is typically measured in terms of firm value measures or financial statistics such as sales, EBITDA, EBIT or net income. Companies of similar size in a given sector are more likely to have similar multiples than companies with significant size discrepancies (Pearl & Rosenbaum, 2013). This reflects the fact that companies of similar size are also likely to be similar in other aspects, for example economies of scale, purchasing power, growth prospects, which would decrease the differences in valuation. In this case, revenues are deemed as the most suitable proxy for size as the industry is highly driven by economies of scale which suggest that there are substantial benefits to increasing unit sales and thereby revenues. Figure 8 show the comparable companies size relative to Volvo and reveal that Volvo is smaller than all the identified companies.

Figure 8. Size relative to Volvo



Source: Own construction using company filings

It also reveals that Toyota, Volkswagen, and Daimler is 12,8x, 11,6x, and 8x the size of Volvo respectively. This, combined with the business profile analysis, leads to the conclusion that their value is driven by a number of factors not comparable to Volvo, and is therefore excluded from the peer group. It is also worth noting, the only company in the sample of equal size is Mazda, all others are substantially bigger which will negatively affect the accuracy of the valuation.

Profitability measures a company's ability to convert sales into profit[3]. As a general rule, companies within the same sector with higher profit margins translate into higher valuations, all else being equal (Pearl & Rosenbaum, 2013). This highlights the important of determining a company's relative profitability versus its peer. As seen in table 6, Volvo's margins are roughly in line with the peer group average. However, there is some variation in the sample where BMW and Renault are the top performers and Fiat Chrysler and

[3] All profitability measures equal the respective earnings metric as a proportion of sales.

Mazda the worst. All other things equal, this would imply a higher valuation of BMW and Renault, and a lower valuation of Fiat Chrysler and Mazda relative to Volvo. However, profitability margins are relatively centred around the mean which suggest that all companies, from a profitability perspective, to a sufficient level reflect Volvo's profitability prospects.

Table 6. Peer group profitability and growth measures

Company	Return	LTM Profitability Margins				Growth Rates			
		Gross			Net	Sales CAGR		EBITDA CAGR	
	ROIC (%)	Profit (%)	EBITDA (%)	EBIT (%)	Income (%)	Hist. 2-year	Est. 2-year	Hist. 2-year	Est. 2-year
Volvo		24%	12%	6%	4%	15%	-	34%	-
Europe									
BMW	5%	23%	16%	10%	7%	8%	3%	2%	1%
Renault	7%	21%	15%	10%	7%	12%	7%	15%	-8%
North-America									
GM	10%	23%	14%	8%	6%	13%	-1%	28%	-13%
Ford	6%	11%	12%	6%	5%	12%	-1%	22%	-14%
Fiat Chrysler	12%	15%	11%	6%	2%	9%	4%	24%	8%
Asia-Pacific									
Mazda	13%	24%	8%	5%	3%	13%	6%	13%	-2%
Mean	**9%**	**20%**	**13%**	**7%**	**5%**	**11%**	**3%**	**17%**	**-5%**
Median	**8%**	**22%**	**13%**	**7%**	**5%**	**12%**	**4%**	**18%**	**-5%**

Source: Own construction using data from Bloomberg

Growth profile refers to a company's historical and estimated future financial performance, which is an important driver of valuation since investors reward high growth companies with higher trading multiples than slower growing peers (Pearl & Rosenbaum, 2013). The growth profile is determined by assessing a company's historical and estimated future growth rates for various financial statistics, such as sales and EBITDA at selected intervals. Table 6 show both the historical and expected two-year growth for the comparable companies. The estimated two-year EBITDA growth ranges between -9% to 8% where Ford and GM are expected to perform the worst, whereas Fiat-Chrysler is at the top. Since Volvo is expected to see strong growth in the coming years, GM and Ford's multiples will be a poor reflection of Volvo's future growth opportunities whereas Fiat-Chrysler is a better match.

Return on investment measures a company's ability to generate returns to its capital providers. There are various measures of return as presented in table 6, for the purpose of this analysis return on invested capital (ROIC[4]) will be used as it measures how good the company is at utilising its invested capital and is thus independent of capital structure. A ROIC break-down is performed in section 7.3.1 and based on those results, it is evident that Volvo outperforms the peer group companies. This primarily driven by a superior turnover rate of invested capital. Mazda and Fiat Chrysler have increased their ROIC the most during the observation period and are the comps that come closest to Volvo's level. However, no major conclusion

[4] $ROIC = \frac{NOPLAT}{(Invested\ Capital_t + Invested\ Capital_{t-1})/_2}$

will be made on ROIC but all other things equal, it would imply that Volvo should have a high valuation relative to the peer group.

Credit profile refers to a company's creditworthiness as a borrower, typically measured by metrics relating to a company's overall debt level (leverage) as well as its ability to make interest payments (coverage). These measures reflect key company and sector specific benefits and risks (Pearl & Rosenbaum, 2013). Leverage and coverage ratios are depicted in table 7 and reveal that even though Volvo has negative NIBD, the company has below average coverage ratios.

Table 7. Credit profile

Company	LTM Leverage Ratios			LTM Coverage Ratios		
	NIBD / Tot. Cap.	Total Debt / EBITDA	NIBD / EBITDA	EBITDA / Int. Exp.	EBITDA - Cpx / Int.	EBIT / Int. Exp.
BMW	56%	6,9x	5,8x	45,1x	27,3x	29,8x
Reanult	52%	6,1x	4,1x	20,2x	12,1x	12,8x
GM	42%	4,9x	3,0x	40,4x	23,7x	22,2x
Ford	49%	9,2x	5,4x	20,3x	12,5x	10,6x
Fiat Chrysler	45%	2,8x	1,4x	10,0x	2,8x	5,1x
Mazda	12%	2,7x	0,6x	24,3x	16,0x	16,3x
Mean	**42%**	**5,4x**	**3,4x**	**26,7x**	**15,7x**	**16,1x**
Median	**47%**	**5,5x**	**3,5x**	**22,3x**	**14,2x**	**14,6x**

Source: Own construction using data from Bloomberg

As shown in the table, Mazda is a clear outlier in terms of leverage whereas the other comparable companies are fairly concentrated around the 50% mark. While BMW is the most levered company, it demonstrates strong coverage ratios. Fiat Chrysler is an outlier who, with below average leverage ratios, has the most problem covering its interest payments which becomes especially evident when accounting for the required capex investments. When looking at Volvo's credit profile, it very much resembles Mazda, with both low leverage ratios and low coverage, which increases the reliability of using Mazda as a comparable company.

Financial analysis conclusion. Based on the business profile analysis and the relative size, Toyota, Volkswagen and Daimler have been deemed to not sufficiently reflect Volvo in order to be included as peer companies. Even though the following parts of the financial analysis did not find it relevant to exclude any of the remaining companies a few key discrepancies were revealed, namely, Volvo is the smallest company in the group, and the company's coverage ratios are amongst the worst in the group despite being the least levered. On the positive side, the company has average profitability, superior ROIC and the peer group is expected to grow modestly whereas Volvo has good growth prospects (Further discussed in section 8).

PART III: FUNDAMENTAL ANALYSIS

Part III will be present both in an external- and internal analysis in order to determine how Volvo generates value and its ability to generate value in the future. The chapter starts with a strategic analysis and then proceeds to financial analysis of Volvo and its peers.

6 Strategic Analysis

In order to measure value and how value is generated, an assessment of the competitive environment in which the company operates is necessary (Evans & Mellen, 2010). This includes analysing both the external and internal condition that influence, and will influence, the performance of the company. In the valuation process, the inclusion of such analysis provides a dynamic assessment of the company's performance – not just the results, but also the causes of these results. Though history can provide a lot of valuable insights, the strategic analysis is forward-looking. The strategic (or competitive) analysis begins at the macroenvironmental level. The macro analysis is complemented by an analysis of the key markets that are important to Volvo (and the industry as a whole). The strategic analysis proceeds by investigating the factors that influence the industry's profitability. This strategic analysis will be applied through Porter's Five Forces, which one of the best-known frameworks (or methodologies) for industry analysis. Since Volvo aim to compete in the premium segment that part of the industry will be emphasised. The strategic analysis continues with a review of the company's resources and competences through the Resource-Based View (RBV) and the Value, Rarity, Imitability, and Organisation (VRIO) framework. Finally, the last aspect of the strategic analysis is the identification of key issues (strategic drivers) based on the external and internal analysis, which is reflected in the Strengths, Weaknesses, Opportunities, Threats (SWOT) framework.

6.1 External Analysis

6.1.1 PEST

The PEST analysis consists of four elements: political, economic, social, technological and explores the outlook for conditions in which all companies will operate (Grant, 2013). Though the macroenvironmental factors are beyond the control of the company, it is necessary to assess their effect on the company's performance. Volvo is a global organisation with manufacturing, assembly and supportive functions on several continents. Therefore, numerous factors will influence industry and affect the company's profitability and risk.

Political Factors

Operating as a global organisation, with large costs and revenues stemming from operations on multiple continents, Volvo is highly subject to the global political environment, especially regarding attitudes towards commerce and trade. The role of governments is highly significant in the automobile industry, with energy and environmental policies playing a role in forming the industry in the coming years.

In recent years there has been a protectionist wave swooping over the developed economies; the United Kingdom's decision to leave the European Union (BREXIT; EU), the election of Trump and a wide-ranging shift to the right in European politics (Shuster, 2016). The U.S withdrawal from the transpacific trade partnership is one result of this shift and also raises concerns about the future of the transatlantic trade and investment partnership as well as the North American free trade agreement (The White House, 2017). Furthermore, Trump has repeatedly threatened to impose tariffs and raising import taxes (Martin, 2017). Given that the U.S is an important market for Volvo, and increasingly so with the investment in the South Carolina manufacturing plant, such initiatives will eventually lead to a pressure on Volvo's ability to generate profits in the country.

The negative effect will be inevitable since Volvo will not be able to produce all models at the South Carolina plant but will remain reliant on imports as a big proportion of their U.S. sales (Bloomberg, 2017a). This type of protectionist threats and actions are not limited to the U.S., some of Volvo's key markets in Western Europe see right wing parties increasing in popularity, which possibly impose a similar threat to free-trade as Donald Trump. Additionally, the Chinese government's limits on new vehicle registration, Co2 emission regulation and the favouring of alternative transports also acts as a limitation to growth and profitability (Bloomberg, 2013). This kind of government support and intervention is promoting the adaption of alternative fuelled vehicles – through infrastructure investments supporting electrified vehicles and purchase incentives – are among other the most important governmental actions affecting the consumer's purchase decision away from fossil fuelled automobiles.

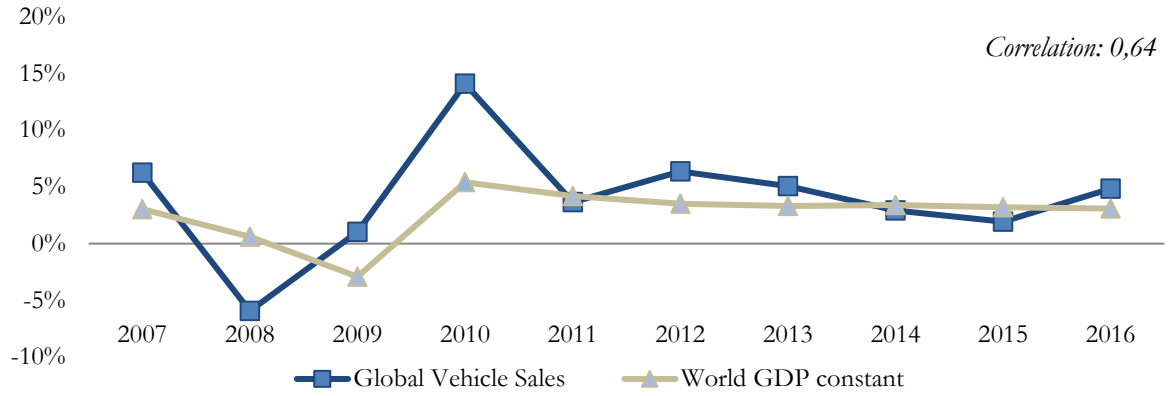
Economic Factors

The automobile industry is truly a global industry, with passenger cars and the car culture spread over the entire globe. In 2016, the global new vehicles market reached a volume over 62 million car purchased/registered (OICA, 2017a). The volume of passenger cars sold experienced a strong comeback since the 2008-2009 economic crisis, mainly attributed to the increased demand from the Asian-Pacific region and North America whilst the European market displayed a weaker recovery. Given the vast variances between different economies and countries, the future is not the same for every country or type of car. Therefore, the industry is broken down geographically as follows: North America, Europe, Asia-Pacific, and Rest of the World. The automobile industry's growth is tightly linked to macroeconomic factors; expressed as either the general economic environment or more specific as gross domestic product (GDP) growth. Other factors that affect the industry are interest rates, price of commodities and raw materials and exchange rates (FX) – factors that will be elaborated upon.

The relationship between world GDP and the automotive demand (defined as world vehicle sales – passenger cars and light trucks) is displayed in figure 10. As seen in the figure, the automotive industry tends to move with the overall business cycle with a correlation between global GDP and global vehicles of 0,64

between 2007 and 2016. Moreover, examining the key markets of Volvo, a similar correlation is found between domestic vehicle sales and domestic GDP growth; Europe (0,83), North-America (0,92), China (0,69), Asia-Pacific (0,51), Sweden (0,83) (appendix 1)[5].

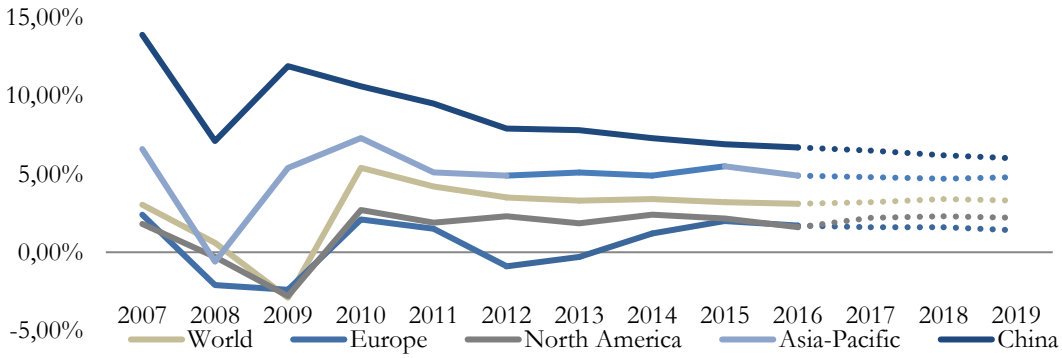
Figure 10. World GDP growth and global vehicle sales



Source: Bloomberg / IMF (2017a). Compiled by the authors

During the financial crisis of 2008, world-wide GDP experienced a downfall. This was reflected in the fall of vehicle sales and demand as consumers likely postponed the purchase of a new car. The setbacks of economies affected the global automobile manufacturing industry, but were primarily felt in North-America where the two largest manufacturers (GM and Chrysler) were threatened. The pent-up demand for new cars, following the comeback of the economy, is clearly shown in figure 10. The rise accelerated the recovery of new car sales substantially and led to a 14% increase in 2010.

Figure 11. Historical and expected GDP growth



Source: Bloomberg /IMF (2017a) Compiled by the authors

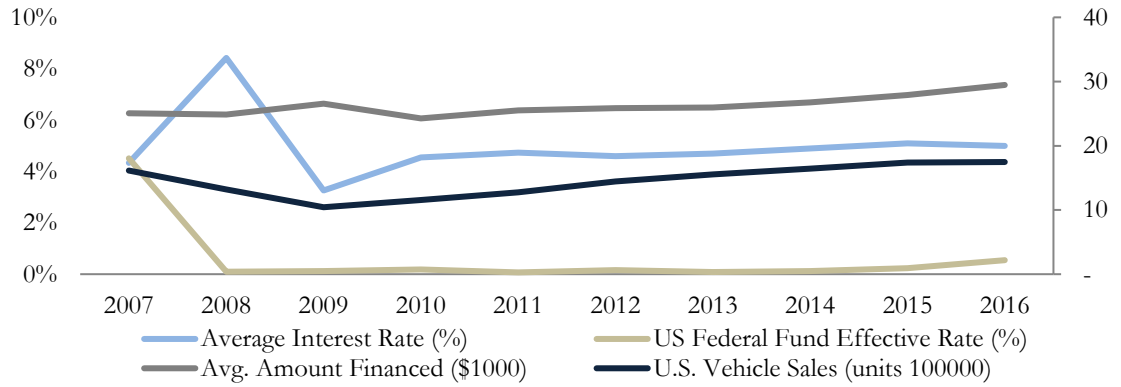
[5] Correlation coefficient = $\frac{1}{n-1}\sum\frac{(x-\bar{x})}{s_x}\frac{(y-\bar{y})}{s_y}$

The Asian-Pacific region was less affected by the crisis compared to the developed markets and recovered faster in the years that followed the crisis, as shown in figure 11. As a result from a significantly higher economic growth over the entire decade, China is the largest automobile producing country in the world (OICA, 2017b). The development of the Chinese market has been a critically important market for global car manufacturers in order offset falling sales in Europe (Business Insider, 2014).

The outlook of the industry is dependent on numerous different markets with different underlying growth, fundamental drivers and challenges. Looking at global figures, the economy ended 2016 with a growth rate of 3,1%. According to IMF (2017), from 2017 through 2019 global growth is expected to be within the interval of 3,3% and 3,4%. The Asia-Pacific region fronted by China is expected to be the primary driver of global economic growth with an expected GDP growth of 6% in 2019. The North American economy is expected to somewhat stabilise and grow in the interval of 2,2% and 2,3% while the European will continue facing challenges, especially with regards to the uncertain effects of the upcoming BREXIT, and has a projected modest growth interval between 1,4% and 1,6%. However, considering political factors, it is important to point out that the projections of economic activity are likely subject to a wide dispersion of possible outcomes, given the uncertainty surrounding the policy stance of the Trump administration and its global ramification.

Interest rates are a high determinant of credit availability, when interest rates are low credit availability is high (Guttentag, 1960). This will stimulate large debt financed purchases, hence increase the demand for new cars. For example, there is a long tradition in the U.S of financing new car with loans. The motivation of low interest rates on financing car sales can be portrayed by examining the interest rate that is offered by financing companies in the US for a new car loan (captive rates) and the relationship with general interest rates.

Figure 12. Relationship between interest rate (L) and car sales (R)

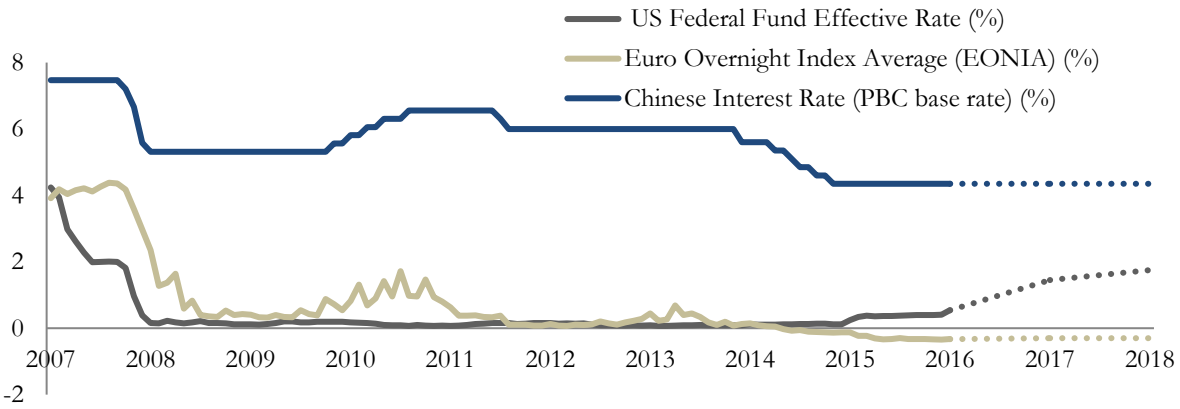


Source: Constructed by authors using data from Federal Reserve. (2017a; 2017b)

As seen in figure 12, when borrowing rates are high consumers tend to shy away from financing the car purchase with loans as the price of a car bought on credit increases. When captive rates on car loans rose as a result of the financial crisis in 2008, credit became substantially more expensive and car sales suffered. On the other hand, low interest rates boost captive financing and non-captive providers as consumers take advantage of favourable financing deals.

The situation in the U.S. is not singular, with extremely low interest rates (even negative) in western Europe and the U.S., the availability of credit is very high on a number of Volvo's key markets which likely boosts sales (Constâncio, 2016; Federal Reserve, 2017a). According to the car-financing association AKA (2016) about 75% of new cars are financed in Germany. The number is similar in the U.K. with over 80% of sales financed; similar to France, Italy, and Spain (Bloomberg, 2017c). In retrospect, the recovery in developed economies has been driven by fundamental factors such as low interest rates through quantitative easing (QE). However, as economies is reaching the points where central banks are now trying to hike rates, finance companies may assume more risk to keep originations growing, putting pressure on earnings of automakers.

Figure 13. Historical and expected interest rates

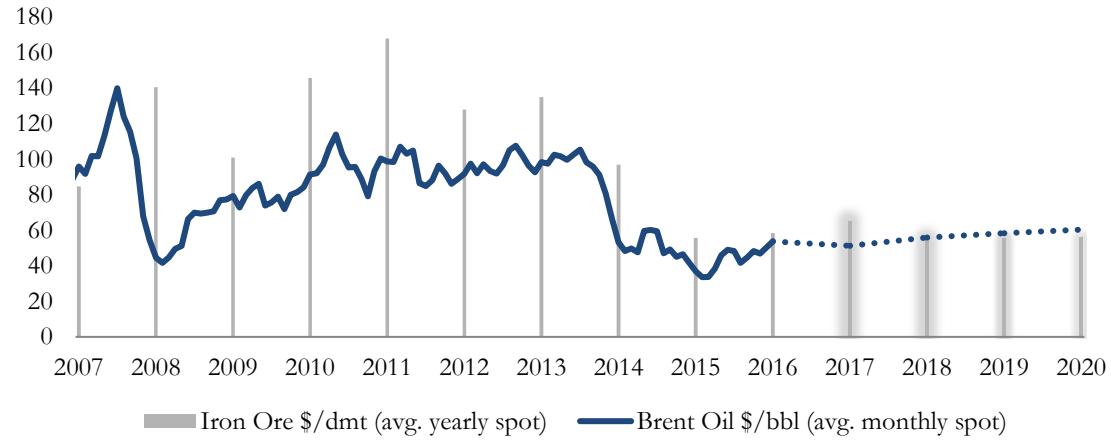


Source: World Bank (2017) / OECD (2017) / Bloomberg..Compiled by the authors

The historical interest rates and future expected interest rates can be seen in figure 13. The hiking trend is expected to continue in the U.S., whereas in the Euro zone the European Central Bank's (ECB) Euro Overnight Index Average (EONIA) is expected to remain at remarkably low levels. In China, the People's Bank of China's base rate is expected to remain at current levels.

Commodities prices and exchange rates are additional economic factors that influence the industry's profitability. Materials make up 47% of the cost components and examining the vehicle composition as percent of curb weight for a medium-sized car, steel, aluminium and iron make up roughly 63% of the weight (the remaining 37% consist of other material, plastics, and glass) (Just Auto, 2017). Hence any fluctuations in raw materials prices has a direct impact on profitability, as these are costs that cannot be transferred to customers. As seen in figure 14**,** current commodity prices are at a relatively low level.

Figure 14. Historical commodities prices & forecast



Source: World Bank (2017) / Bloomberg. Compiled by the authors

Yet, as global demand for car rises, so will the demand for raw materials used in the production of cars. Since automakers are sensitive for movements in the cost of material, changes in commodity prices are often managed through forward contracts or long term contracts with suppliers. As a result, the actual impact of rising commodity prices on production costs is determined by the relative buyer/supplier power relationship (discussed in section 6.1.3).

The price of crude oil is another factor that affects the performance of the automotive industry. The price of oil plays an important role for the automotive industry as fluctuations in gasoline price affect the purchasing power of consumers. The opportunity costs for consumers are decreasing as the supply of alternatives to non-renewable fuel driven cars are increasing, which put pressure on traditional car manufacturers. Oil prices have recently increased and are expected to continue on this trend, which according to IMF (2017a) reflects an agreement among major producers to trim supply. The price of iron has also strengthened due to strong infrastructure and real estate investment in China as well as expectations of fiscal easing in the U.S. (IMF, 2017b).

As the globalisation of the automobile industry continues, the currency exposure for industry participants increase. As highlighted by Goedhart, Koller and Rehm (2015), FX risk is a company specific issue and based on in which currencies the individual company has its cash flow streams. Further, it is assumed to be a short term issue as relative purchasing-power-parity is expected to hold over the long run (Rogoff, 1996). Thus, no general conclusions on the implications of FX risk can be made on an industry level. However, in the short-term it does have implications on company level and is something that all companies actively hedge to some extent through financial instruments such as futures, swaps or options (Goedhart, Koller, & Rehm, 2015).

Social and Cultural Factors

Mobility is central to the way people live their lives. With 70% of the world's population expected to live in cities by 2050, social mobility has a big impact on the future of the automobile industry. Overcrowding will become ha harsh reality for AMs, which calls for supporting alternative means of transportation (Deloitte, 2014a). Hence alternative ownership models and increased attractiveness of substitutes will have to be carefully managed to ensure future success. Furthermore, customer demographics play a critical role as the demand for premium products are not only tied to the economic environment (disposable income), but also the preferences of the consumers. Trends and changing consumer preference puts pressure on the industry and auto manufacturers to have a wide product portfolio that quickly can respond to changing demands. In addition, consumer preferences are influenced by geographical location and different cultures which forces auto manufacturers to further adapt their product offerings.

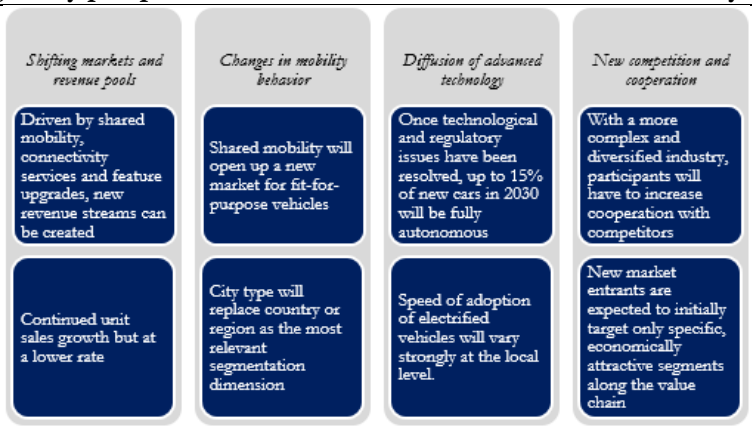
To use Volvo as an example, in Asia long and more exclusive models being more popular whereas Europeans and Americans prefer more conventional type cars (Volvo Cars, 2015). A particular recent trend is consumers increased demand for larger cars, which contradicts the strict environmental regulation that is being imposed on the automobile industry (Volvo Cars, 2015). This will challenge the industry going forward as the development of engines will be heavily influenced by environmental regulations.

Technological Factors

Most industry analysts and participants have acknowledged four major technology-driven trends that will shape the competitive landscape going forward, diverse mobility, autonomous driving, electrification and connectivity (McKinsey & Company, 2016). Manufacturers that invests in more advanced technology are seeing strong volume growth and market research show that buyers will pay a premium for autonomous driving features, unlike improved emissions (Bloomberg, 2017b). Figure 15 show the four technological trends as identified by McKinsey & Company (2016). Based on these trends, the consulting firm drafted eight key perspectives on the future of the automotive industry.

These trends have not passed by auto manufacturers. Companies have shaped their strategies after "consensus" trends, where R&D efforts are focus on connectivity, autonomous cars and electrification. The consumer demand of these four technology trends will mainly be driven by the mega cities around the world, where car ownership is becoming more and more disadvantageous due to factors such as regulation and space. Volvo's 100 % ownership of the Swedish car sharing company Sunfleet, Audi's Unite, BMW's ReachNow, and Toyota's GetAround exemplifies the adaptations to these trends. These are examples of car sharing companies that major industry participants have invested in to get a piece of the growing car sharing market, which according to McKinsey & Company (2016) will have a negative impact on revenues in the long run.

Figure 15. The eight key perspectives on the future of the automotive industry



Source: (McKinsey & Company, 2016)

As the industry becomes increasingly technologically complex with connectivity and autonomous drive, the value chain is likely to change with both new suppliers capturing value and competitors capturing market share. As a response, McKinsey & Company (2016) see a more consolidated market or new forms of strategic partnerships among incumbent players, thus creating a much more complex value chain than the current.

Further, AMs are expected to increase their presence and make use of the opportunities online to a greater extent going forward. This comes as a response to customers using a greater variety of information sources and sales channels before making the buy decision in addition to demanding a more individualised experience. This is especially evident in the premium segment where AMs are expected to increase their presence in every step of the sales process (Lankers, 2014)

6.1.2 Key Markets Analysis

North America

The North American markets are peaking at historical levels and experienced a very strong growth after the economic crisis in 2008. In aggregate, the market had total revenues of €249[6] billion and over 9 million cars sold in 2016 representing a 4-year CAGR of 8,1% and 5,6% respectively (MarketLine, 2016a). The market is dominated by the US in terms of both units sold and value (89,5% in 2015), hence the performance of the North American market as a whole is essentially dictated by the progress in the U.S. Though new vehicle sales in the U.S. have increased in seven consecutive years, automakers now fear that this growth might be stagnating (Bloomberg, 2017b). Market researchers forecast the North American market to have a volume (units sold) of 9,5 million units sold in 2020 and a corresponding market value of €290 billion representing a four-year CAGR of 1,5% and 4% respectively from 2016 (MarketLine, 2016a). Despite a projected lower growth over the coming four years, the North American market continues to be a stimulus

[6] Fixed exchange rates are used in calculations in order to remove the impact of exchange rate fluctuations from the year-on-year growth rates (MarketLine, 2016).

for global demand for new cars as the American consumer appears to buy cars regardless of how the economy is doing (MarketLine, 2016b). One of the drivers for the large numbers of buyers are low taxes on new cars and no VAT tax. The current relative low costs of a new car and its further running costs, contributes to less price-sensitive buyers as compared to other regions (MarketLine, 2016b).
In terms of market shares by value in 2015, four major players dominate the market: General Motors (17.4%), Ford (14,1%), Toyota (12,7%) Fiat Chrysler Automobiles (11,8%), while "Other" accounted for 44%. Ford F-Series (full-size pickup truck) was the best-selling model in 2015 followed by the Chevrolet Silverado (full-size pickup truck) and Toyota Camry (sedan) (MarketLine, 2016b). The bestselling model, as mentioned above, represents a shift in the U.S. auto industry sales mix – namely increasing large vehicles sales. As total demand is expected to somewhat flatten, the key driver that will enable wider profit margins is to offset lost car sales by selling more of large-type passengers cars (pick-up trucks, SUVs and crossovers). Currently the product category counts for 38% of the market with growing numbers (Bloomberg, 2017b).

Europe

The European (incl. Sweden) new cars market has experienced weak growth since the financial downturn. The region has been restrained by significant local economies that are struggling to grow, such as Spain and Italy, and this is reflected in the growth of the new cars market. In terms of units sold, the market reached close to 16 million units sold corresponding to a market value of €394,3 million. This represents a compound annual rate in units sold of -1% and a respective 1,4% in value between 2011-2015 (MarketLine , 2016c). Geographically, measured in terms of new cars market value 2015, the market is concentrated to Germany who accounts for 23.7% followed by the UK (19,1%), France (12,1%), Italy (8,8%), and Spain (6,7%). In the rest of Europe (29,1%), Russia is the major contributor with 2,85% of the market value (MarketLine , 2016c). Looking at the historical segmentation, the ratios in 2016 is a valid representation of how the breakdown has been in the European region. The contribution of key markets, as mentioned above, have been fairly stable over a 10-year period (see appendix 2). Thus, the outlook of the entire market very much depends on the development in these economies.

Market researchers project a steady growth in the European market, mainly attributed to developments in Germany, Spain, and the U.K., which compensates for the poor outlook of the French market (MarketLine , 2016c). MarketLine (2016c) project expected growth is also supported from an ease of rivalry due to a larger revenue pool (expanding automotive market) and continuously low fuel prices. Market researchers project a CAGR of 4,4% for the period 2016-2020 which is expected to drive the European new cars market to a value of €483 billion by the end of the period (MarketLine , 2016c).

In terms of market share, Volkswagen, Renault, and PSA Group are the largest local auto manufacturers, still ahead of foreign manufacturers Ford, GM and Toyota. Volkswagen Golf (compact car) was the bestselling model in the market 2015, followed by Volkswagen Polo (compact car), Renault Clio (compact

car), and Ford Fiesta (compact car). Similar to the trend in the U.S., the SUV market in Europe is continuing to gain popularity and reached a market share of 25% of total sales in 2016 as consumers embrace this body-style globally (Bloomberg, 2017c). In addition, as illustrated from General Motors recent withdrawal from the European market, consumers are shifting from "value/volume" cars to "premium" and "budget" cars. This trend is seen in the value segment market share falling to 59% from 74% in 2010 (Bloomberg, 2017c). The Volkswagen emission scandal hurt the diesel market share and automakers are increasing hybrid and electric-vehicle offerings, as a result of overall industry trend but also the increased demand from consumers.

Asia-Pacific

The Asian-Pacific (including China) new cars market has demonstrated an extremely strong growth the last couple of years. The market has grown 10 consecutive years as a result of economic progress, from 15 million new cars in 2007 to nearly 33 million in 2015, representing an eight-year CAGR of 8,7%. The region accounts for around 50% of the global market volume and the new cars market reached a market value of €609.5 billion in 2015, where China accounts for roughly 60% of the value (MarketLine, 2016d). However, the Asia-Pacific market is expected to grow at a more modest growth over the coming years; attributed to Chinese sales-tax increase in 2017 (from 5% to 7,5% for small cars) as well as South Korea ending a consumption-tax cut for cars in 2016 (Bloomberg, 2016a). In Japan, the yen continues to struggle and the auto industry may undergo further consolidation as sales decline on the home market for Japanese AMs. Further, surging development costs to meet the demands of the evolving industry calls for a need for collaboration between the automakers (Bloomberg, 2016a).

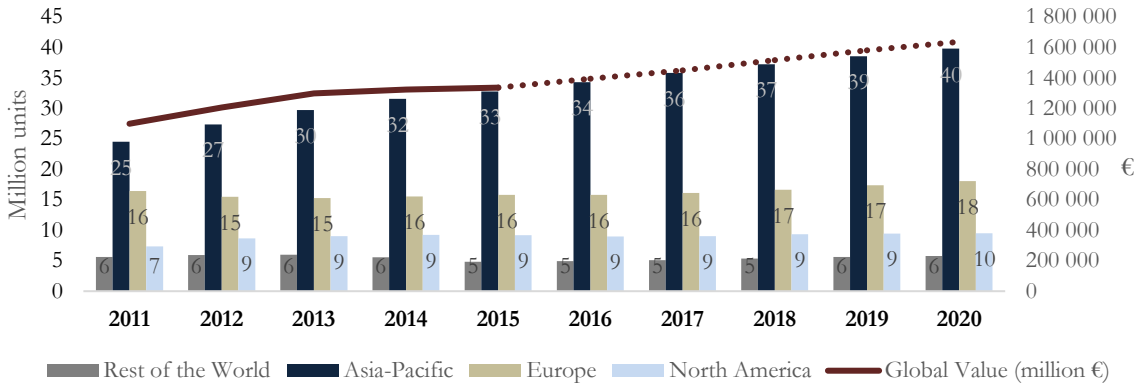
The rise of SUV sales has not passed by the region where it has grown rapidly and accounts for 35% of total passenger cars in China. The growing Chinese middle class and corresponding disposable income indicates a positive trend when it comes to larger, more expensive vehicles, and premium car sales in general (IMF, 2017b.; Hirsh et. al., 2016). Though SUV sales in 2017 are likely to outperform other segments, the strong growth is expected to weaken. Market researchers expect the progression of the market to be mainly be driven by regional growth in India and South Korea. In addition to China, other Asian-Pacific also countries offer growth opportunities going forward given the relatively low level of 'motorisation' (Hirsh et. al., 2016). According to MarketLine (2016d), the region is estimated to reach a volume of 39,8 million new cars in 2020 and a corresponding market value of €751,9 billion, representing a four-year CAGR of 3,8% and 3,6% respectively.

Summary: Global Perspective

The auto-market is facing challenges and uncertainties in future earnings as the industry is disrupted by technology, increasing R&D costs and political risks regarding BREXIT and elections. Moreover, to meet government regulatory demands, companies have to develop more fuel-efficient models. In addition,

it is interestingly to note that auto manufacturers tend to generate most of their revenues from their home market, creating what could be labelled as a "home-bias" of consumers.

Figure 16. Historical and expected new cars sales



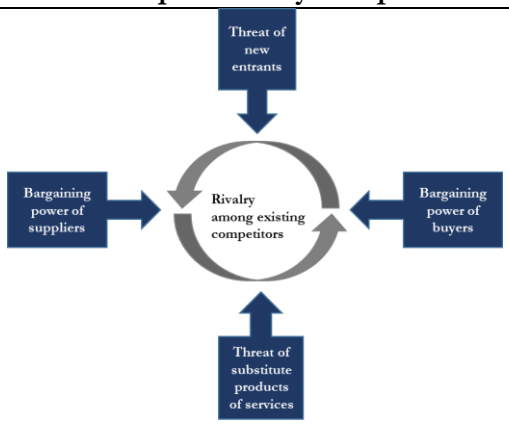
Source: Constructed by the authors using data from MarketLine (2016a) and OICA (2017a)

Sales are expected to be continuously supported by the low interest rate climate that supply consumers with favourable financing deals, though at a more modest pace. Worldwide, crossovers and SUVs are attracting buyers away from traditional cars, as safer technology-packed vehicles that still offer fuel efficiency is becoming increasingly more attractive for consumers. This trend is also current in historically car-focused regions such as China and Europe, where the rising SUV sales in China is putting the country closer to the top (Bloomberg, 2016b). The increased demand of SUV's presents automakers with market-share opportunities and the demand is expected to support the decreasing sales by boosting earnings through wider margins (Bloomberg, 2016b). Figure 16 show the historical development and the expected future outlook for the global car sales market. According to MarketLine (2016a) researcher's expectations, the number of units sold is expected to grow from around 64 million in 2016 to above 73 million units by the end of 2020 corresponding to a four-year CAGR of 3,4%. In terms of value, the global new cars market is estimated to reach a value of 1.6 billion € by the end of 2020, representing a four-year CAGR of 4,1%.

6.1.3 Porter's Five Forces

In 1980, Michael Porter published the article "Competitive Strategy: Techniques for Analysing Industries and Competitors" in which he argued that the competitive degree of an industry shapes the strategy of its participants. The competitive degree can be analysed using what Porter (1980) defines as the "five forces", as illustrated in figure 17. The forces that influence the profitability and the strategy of markets participants are identified as threat of new entrant, bargaining power of suppliers, bargaining power of buyers and threat of substitutes. According to Porter (1980), the long-term profitability of an industry is determined by the collective strengths of the five forces, where the prospects of realising superior performance decrease with intensity of the forces.

Figure 17. Porter's five forces that shape industry competition



Source: own depiction from Porter (2008)

Threat of New Entrants

Classic economics theory suggest that when an industry is profitable, new firms will try to enter the market in order to capture a piece of the profit from the incumbent firms. This will continue until the market is in a competitive equilibria and profits near zero (Hendrikse, 2003). Therefore, the magnitude of the threat of new entrants on industry profitability depend on entry barriers and on the reaction from incumbent firms that the entrant can expect (Porter, 2008). According to Porter (2008), the threat from new entrants diversifying from other markets could potentially have a material impact on profitability as they can leverage already existing assets, capabilities and cash flows, forcing incumbent firms to heavy investments or lower prices. Additionally, Porter (1980) identifies seven major sources of barriers to entry; supply-side economies of scale; demand-side benefits of scale; capital requirements; restrictive government policy; customer switching costs; incumbency advantages independent of size; and unequal access to distribution channels. For this analysis, the first four sources are identified as major sources of entry barriers in the automobile industry and will be further elaborated upon.

Supply-side economies of scale have historically played a major role in the automobile industry, starting with Henry Ford's innovation of the assembly line and they arise when more cost can be spread over more units or when more units can leverage innovations. The importance of economies of scale in the industry has even been used as an example by Porter (1979 p. 139) which states that "*in the auto industry economies of scale increased enormously with post-World War II automation and vertical integration – virtually stopping successful new entry*". Scale economies are present in a vast number of activities in the value chain; mass production, bulk orders in procurement, design and R&D. With regard to the latter, this is especially present for R&D since the automobile industry is one of the most R&D intense industries in the world (PwC Strategy&, 2016).

Demand-side benefits of scale are referred to as network effects and arises when the willingness to pay increases with the number of other buyers. Network effects are present since many companies have a

rich history that has enabled strong branding and brand image. Brand equity plays an important role in the industry as it often functions as a key differentiator. According to Smith and Colgate (2007) the role of prestige and image is especially important for premium and luxury type products. In addition, demand-side benefits of scale are likely to play a larger role in the future due to the development and implementation of connectivity based technologies, where benefits stem from the number of vehicles connected to the system

Capital requirements create a substantial entry barrier because the industry is both highly labour and capital intensive. Initial investments such as developing the products, setting up production facilities ready for mass production and creating brand equity through marketing requires heavy investment. For instance, the new Audi plant in Mexico required an investment in excess of €1 billion for the annual production of 150.000 cars (Audi, 2016). In addition, maintenance, labour costs, R&D expenditures and distribution on a global scale makes the industry capital intense. These kind of capital requirements represent upfront sunk investments and often such activities are difficult to finance on capital markets, which enhances the barriers to enter (Porter, 1980). In addition, the regulatory pressure is likely to increase, especially with regards to Co2 emission (McKinsey & Company, 2016). This puts a tremendous pressure on R&D as it diverges with the consumer behaviour of demanding larger-type vehicles. This does not only put pressure on the AMs own R&D activities, but also the need to have a reliable and innovative supply-chain.

Government policy was discussed in the previous PEST analysis where environmental legislature and protectionism were highlighted as affecting the industry greatly. For example, foreign firms have to invest in a joint venture with a Chinese firm to establish production within the Chinese borders. This hurdle has created the opportunity for numerous domestic Chinese manufacturers to enter the industry. Moreover, through technological shifts (a factor not a force), companies such as Tesla has managed to exploit the shift towards electrification by launching electrified vehicles before all the major AM's (Stringham, Miller, & Clark, 2015). Proving that technological shifts opens the possibility of a shift in the industry structure provides possibilities for new competitors to enter the market. Examples of potential new entrants are tech giants Apple with its project Titan and Google with Waymo (Maisto, 2016; Waymo, 2017).

In conclusion, the threat of new entrants is expected to increase significantly, but it does so from seemingly low levels, the threat is deemed moderate.

Bargaining power of suppliers

Porter (2008) highlights relative industry concentration, switching costs, product differentiation, substitutes and prospects for forward integration as the major factors that determine relative bargaining power of suppliers. If suppliers possess substantial bargaining power, they pose a threat to industry profitability by being able to raise prices or lowering quality.

The AM part of the industry value chain is relatively concentrated in comparison to the supply side. The components manufactured are to a large extent standardised and only used in the automotive industry, where AMs incorporate standardized inputs into more complex systems. Historically, the bargaining power of suppliers has been low due to the afore mentioned aspects; AMs can replace suppliers' products if they do not match required standards. In addition, suppliers are affected by the overall economy given the close ties between automotive production and economic environment, suppliers are likely to suffer during economic downturns as AMs can push losses down the value chain. Looking at the U.S. automotive parts industry, the limited profitability (bargaining power) of suppliers becomes apparent since the industry has been in a considerable consolidation wave post financial crisis (International Trade Administration, 2013).

In recent years, there has been a shift in the responsibility as AMs have started to demand increased R&D efforts, as well as more complex and refined products from its suppliers in attempts to push costs and risk down the supply chain (International Trade Administration, 2016). As automakers plan operations on a global scale, this has increased the switching costs (for both parties) as suppliers have to make asset specific investments in terms of placing production in near proximity of the AMs to ensure just-in-time production and to decrease operational risk. The International Trade Administration (ITA) of the Department of Commerce in the U.S. stress the link between AM revenue and supplier profitability. As such, this creates co-dependency which require strong cooperation and communication between the parties. The changing structure of the industry has led to supplies becoming global firms that are expected to have a substantial responsibility in supplying automakers with the necessary inputs. As the automobile industry becomes more technologically complex there will be a shift in bargaining power. AMs will become more dependent on high-cost and low-weight technologically advanced and less standardised components. Agreeing with the McKinsey & Company's automotive report (2016), there is a likely future where technology-type supplier relationships are characteristically more like strategic partnerships than supplier-buyer ones.

In conclusion, it is assumed that suppliers are likely to capture a bigger proportion of industry profitability going forward as a result of increased bargaining power.

Bargaining power of buyers

The power of buyers follows similar logic as suppliers. Porter (2008) identify relative amount of buyers, volume of purchases, product differentiation, switching costs and potential for backward integration as the main factors that determine relative bargaining power. Furthermore, price sensitivity is to be accounted for to assess the likelihood of buyers leveraging their power to pressure prices. There are two layers of buyers in the industry, with dealerships acting as intermediaries between the AMs and the end-user, where the end-user is either a household or a corporation where households are assumed to be the dominant one. The analysis will therefore be conducted upon the relative bargaining power of both dealerships and households.

As described previously, several countries prohibit direct sales from AMs to customers which has created another step in the value chain, dealerships. The products that AMs sell are relatively standardised given that the purpose of the vehicle is the same, transportation of passengers. In addition, given the trend of more individualised sales processes and increased online possibilities, AMs dependency on dealerships are likely to increase as they are the ultimate point of contact with the brand. However, dealers are totally dependent on the AMs as they provide the product and dealers only act as a sales function. This is seemingly the dominant factor as Marketline (2016a) argue for weak bargaining power with the support that auto dealers on average only are able to add a 2% mark-up to the AM invoice price. Thus it is expected that the bargaining power of dealers will increase somewhat from historically low levels.

For households, the relative amount of buyers is arguably very high, the volume of purchase low and the potential of backwards integration non-existent. This implies a relatively low bargaining power of buyers. However, no obvious lock-in effect through asset specific investments or the like has been identified, making the cost of switching car brand very low which is beneficial to the buyers. The low frequency of purchase also suggests relatively low price sensitivity but as the purchase accounts for a big proportion of disposable income, and sometimes financed through loan deals, combined with the increased availability of substitutes (discussed in a later section), customers are arguably relatively price sensitive. This is seen as being even more important for the premium and luxury players as the customers might as well buy a car in a lower segment if the price is deemed too high.

In conclusion, the bargaining power of buyers is seen as relatively high as there are very low switching costs combined with high price sensitivity despite a relatively large amount of buyers and low volume of each purchase.

Threat of Substitutes

A substitute is defined as something that performs the same or a similar task as an industry's product but by different means (Porter, 2008). According to the definition of a substitute, any means of transporting people from point A to point B is considered as one. The threat of substitutes is considered high if it offers an attractive price-performance trade-off and if the switching costs is low. If so, substitutes are considered to impose a ceiling on the prices that can be charged (Porter, 2008).

Possible substitutes include public transportation (metro, bus and train), alternate means of personal transportation (bikes, motorcycles and airplanes), taxi services and used cars. Several of the previously stated substitutes should be considered complements to each other, rather than individual substitutes. In less densely populated areas, the switching cost in terms of time (delays and more time consuming), convenience and utility space (seating space and having to adapt to scheduled departures) make the price-performance trade-off unattractive and maybe not even a viable option. However, in more densely populated areas, public transportation, taxi services and alternate means for transportation forms a viable substitute to buying a car.

Research show that the use of public transport is one the rise as an effect of continued urbanisation. In Europe, the use of public transportation reached its highest level since 2000 though the principal mode of passenger transport continues to be passenger cars driven by the desire of greater mobility and flexibility (UTIP, 2016; Eurostat, 2016).

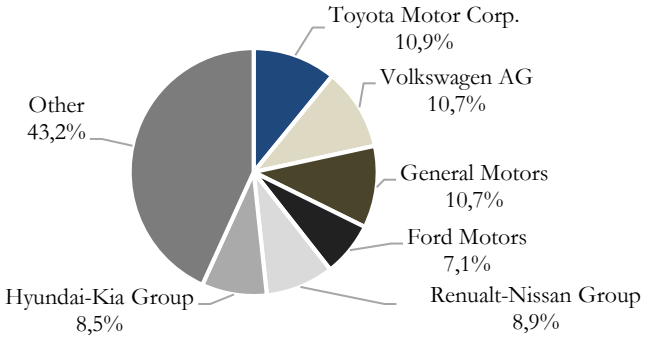
Used cars provide the owner with the exact same functional benefits in terms of time, convenience and utility, decreasing switching costs. The cost of buying a used car comes in the form of higher reparation expenses and the loss of some hedonic values such as image and prestige, and to some degree functional values in form of customisation. Following, the switching costs between a new car and a used one is assumedly very low. Therefore, it is likely that used cars has substantial influence on the price that AMs are able to charge. From a societal standpoint however, governments in several countries actively try to decrease the amount of used cars on the roads for environmental, safety and economic stimulus purposes by implementing scrappage schemes. These policies will likely limit the magnitude of the threat of used cars.

In sum, the threat of substitutes is seen as moderate based on the future car dependency is expected to decrease as viable substitutes gain traction and urbanisation continues.

Industry Rivalry

Rivalry among incumbent firms in the industry is usually expressed in price discounting, new product launches, high importance of marketing efforts and service improvements (Porter, 2008). The degree to which rivalry affect industry profitability depends on, first, intensity and, second, the basis of competition. In turn, the intensity of rivalry is decided by number and relative size of competitors, industry growth and exit barriers. Moreover, price based competition is considered most destructive for industry profitability. This is likely to occur if there is a low degree of product differentiation, low switching costs, high fixed costs are high, and low marginal costs (Porter, 2008).

Figure 18. Global new cars market share (2015)



Source: Own creation using data from Bloomberg

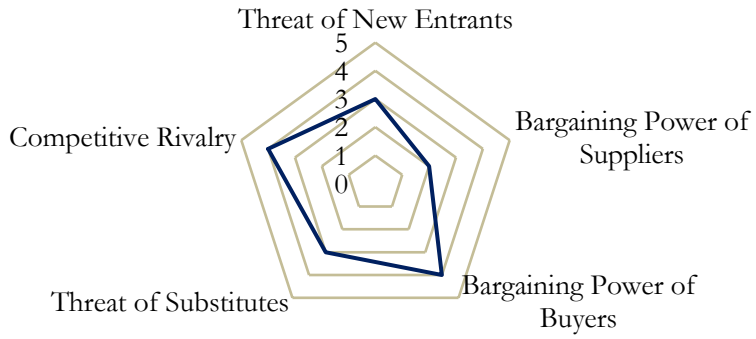
Large-scale multinational companies dominate the automotive industry. Figure 18 show the global new cars market shares in 2015, where the six companies accounted for the majority of new cars. This picture practically resembles an oligopoly, which usually minimises the effects of price-based competition. AMs aim to position themselves in different price segments, such as premium or value brands. As a consequence of changing consumer preferences, companies often offer the "full range" of vehicles types. Moreover, the industry has a low level of functional differentiation, which has led to marketing being a crucial success factor. Considering the fact that there are very low switching costs, this might tempt companies to cut prices or seek alternative strategies that intensify rivalry. In addition, modest growth and substantial exit barriers in terms of sunk costs, specialised equipment and high production capacity intensifies the rivalry. As a result, industry participants now seek growth from strategic partnerships, or external sources of growth through M&A activities. The most recent example is the PSA groups acquisition of Opel/Vauxhall from GM for €2,2 billion (PSA, 2017).

In sum, despite the attempts to decrease the intensity of competition through means such as market segmentation, the conclusive assessment is that the industry has a high rivalry that pressure profitability.

Porter's Five Forces Summary

In conclusion, the automobile industry is highly concentrated. Though there is a wide product range and continuous technological disruption, the market continues to be dominated by a few major companies. This is due to the industry's significant entry barriers, where economies of scale are evident. Access to resources like technology and capital are critical determinants for success within the industry. However, the structure of the industry is evolving and is likely subject to increasing strength from both suppliers, substitutes and new entrants, while already being subject to intense rivalry and strong buyers. This is expected to have a negative impact on industry profitability going forward as the new technology intensive landscape develops. Figure 19 sum up the overall magnitude of respective force in the auto industry on a scale, where 0 represents a non-existent force and 5 a substantial threat to profitability.

Figure 19. Expected impact of the five forces on industry profitability



Source: Own creation

6.2 Internal Analysis

Up until this section, the firm has been viewed as a black box and as a subject to its surroundings. By taking a resource-based approach to the firm, the aim is to identify the key resources and capabilities that Volvo possess and evaluate if the company has the potential of creating a sustainable competitive advantage. Such advantage, according to Grant (2013), translates into the ability to generate above average profits going forward. In order to apply the RBV, one must first define the industry key success factors (KSFs) and the firm's key resources and capabilities related to these KSFs. According to Grant (2003), resources can be divided into tangible, intangible, and human. Capabilities are identified through functional areas such as corporate functions, information management, R&D, design and services; all of which represent the way a firm use bundles of resources for a desired end result (Grant, 2003). While this provides some guidance on how to identify potential sources of key success factors, RBV is often times criticised for being too fuzzy and difficult to apply. Additionally, the perspective has also been criticised for generating assessments of resources and capabilities ex-post and therefore shed little light on future prospects (Kraaijenbrink, Spender, & Groen, 2010).

Despite its weaknesses, when accounting for dynamic capabilities RBV does have explanatory power for future profitability (Kraaijenbrink et al., 2010). In order to assess the potential of identified resources and capabilities, Barney (1991) developed the VRIN framework. According to Barney (1991), the concept of the framework is that in order for a resource or capability to create a sustainable competitive advantage (SCA) it has to be valuable, rare, inimitable and non-substitutable. The author extended the framework in a later paper by including organisation, which highlights the importance of the company being ready to capitalise on its SCAs in order to create value (Barney, 1995).

Identifying Key Resources and Capabilities

As identified in the competitive analysis, brand identity and marketing is crucial for positioning the company on the market. Since it is highly influential on the customer buy decision, brand identity is identified as a KSF. Volvo has a clear brand identity; it promises to deliver superior value in terms of safety, sustainability and quality. For the company to continue providing this to consumers, R&D capabilities within safety and environmental issues are identified as key enablers to success and are thus identified as a potential SCA. In addition, brand management, the way in which the Volvo brand is communicated, is another essential component in brand identity and must also be examined as a potential SCA. Economies of scale is another factor which has been discussed in previous section and is likely to make a KSF, but given Volvo's relative size it is seen as improbable that the company possess an SCA within the underlying resources and capabilities and will thus not be elaborated upon.

6.2.1 VRIO

R&D Capabilities

Volvo has a significant resume of delivering breakthrough innovations targeting safety and environmental issues, most notably the three-point safety belt, rear facing child seats, side collision protection, and the lambda sonde. The company's clear focus on these matters has been consistent throughout its history and facilitated in building one of the safest car manufactures in the world. This is also reflected in its current mission, namely to have no fatal accidents in a Volvo vehicle by 2020 and introducing an electrified car by 2019. In addition to electrified vehicles, Volvo has recently brought its own developed and award winning Drive-E engine family to the market. As of 2015, the company is the only premium manufacturer exclusively offering three and four cylinder engines (Volvo Cars Press Release, 2015). As part of the engine family, the company offers a chargeable hybrid, increasing the environmental focus of the product offering. Moreover, the company's new SPA and CMA platforms are designed to support both the current model fleet and the upcoming electrified versions, making the company prepared for fulfilling their vision of electrified vehicles making up 10% of sales by 2020 (Volvo Cars, 2015).

With regard to the company's mission of zero fatal accidents, the company aims to leverage the current technological development of connectivity and autonomous drive, where fully autonomous vehicles will be important to fulfilling the mission (Volvo Cars, 2015). While fully autonomous cars are in a development phase, semi-autonomous technology is a matter of today. The company's products currently include features such as pilot assist, which makes the car automatically follow the car in front in slow moving queues, stay within the lane markings on highways as well as autonomous emergency breaking when a driver turns in front of an oncoming car (Volvo Cars, 2015). Evidently, these are features that increase road safety. However, even though Volvo claims to be market leading within safety and consistently produce cars that are ranked among the safest in the world, so are many of their main competitors (IIHS, 2016). Given the identified mega trends related to regulatory environment, all players are required to innovate with respect to producing more environmentally friendly vehicles.

Still, there are regulatory policies that prohibit self-driving vehicles. AMs and tech-companies are jointly lobbying for the development of a new regulatory framework regarding self-driving cars, which might take additional time (Self-Driving Coalition for Safer Streets, 2016). Despite the company's rich history and ability to produce ground-breaking innovations regarding safety and the environment, the company that will emerge the winner is impossible to predict as all industry participants invest heavily in becoming number one. Further, as cars are becoming more technologically complex, the potential threat of tech giants such as Google and Apple to enter the market has increased. This development has increased the importance of getting knowledge and technologies from external sources through some form of strategic partnership.

In conclusion, even though Volvo's R&D capabilities are valuable and imperative for delivering what the company promises, it is not considered rare nor in-imitable. Additionally, the increased importance of strategic partnerships makes it substitutable to some extent. With regard to Volvo's organisation, the company increased its global manufacturing footprint and scale. The new SPA and CMA platforms, Drive-E engines and has enable the company to readily be able to capitalise on any new innovations that the R&D comes up with.

Brand Management

In order to assess the company's brand management capabilities, and how these affect the performance of the company, it is imperative to define brand management and the value it brings. In essence, brand management is the analysis and planning on how the brand is perceived in the markets. The ability of creating a strong brand comes from the resources within the company (most distinctively from marketers), which focus on creating, maintain, enhancing, and protecting the brand (Kotler & Keller, 2012). As a result, or capability/performance, the value of brand management is reflected in the company's "brand equity". According to Keller (2008), brand equity is defined as the added value endowed on products and services. This may be reflected in the way consumers think, feel, and act with respect to the brand as well as in the prices and profitability the brand commands. Studies have shown that a strong car brand can create significant value in the automotive industry; the price consumers expect to pay for otherwise identical premium vehicles can vary as much as $4.000 depending on the car's brand (Hirsch, Hedlund, & Schweizer, 2003). The difference is attributed to consumer's perception of the brand, which is evaluated in terms of its earned reputation (accumulated direct and indirect experience) for product excellence relative to the total ownership cost (Hirsch, et al., 2003).

Volvo has throughout the company's history been focused on its traditional values of safety, environmental concern and traditional minimalistic design (classic Scandinavian "understated" design), as reflected in both the company's mission and vision (Volvo Cars, 2015). Despite its relatively small size, the company has been premiered for its successful development of safety features and perceived as producing the safest cars in the world (Consumer Reports, 2014). The company's current brand management strategy was introduced in 2011 under the slogan "*Designed Around You",* as the company began its journey to move upmarket, which continues to build on the human centric foundation that the company was founded on.

Under this parole, the company has introduced the "*Volvo Way to Market*" in which the company aim to change the ways cars are marketed and sold through redefining the concept of customer service and customer relations (Volvo Cars Press Release, 2011). More specifically, by leveraging the Scandinavian heritage in dealerships (waiting areas would for example be fitted with Swedish furnishing), improving the digital platform to engage and serve customers (for example, customers will receive a short video showing what the car will look like when delivered). Further, this included a focus on building a personal relationship

with customers by providing a personal service technician that is available seven days a week during the duration of the car ownership (Volvo Cars Press Release, 2014). The new strategy also included a doubling the amount of money spent on marketing in which the company highlighted the Scandinavian roots, values as well as the 2020 safety visions through different media channels tailored depending on which market (McNamara & Moore-Mangin, 2015; Volvo Cars, 2015; Gurjit, 2016).

Clearly, all of these efforts aim to increase customer's satisfaction and perception of the brand as means to increase sales. The new strategy's success is reflected in the company's fruitful transition into the premium segment, where profitability and sales has increased substantially despite the increase of price for its products. As a result, Volvo has, from a customer-based brand equity perspective, created a positive differential effect on consumers based on the consumer's knowledge of the brand. According to Kotler and Keller (2012) consumers' brand knowledge refers to all the thoughts, feelings, images, experiences, and beliefs associated with the brand. Given the company's rich history of safety engineering and other innovations, customers [likely] react favourably to the product and the way it is marketed (in other words, the identity of the brand) and associate Volvo with solidity, safety and the characteristic Scandinavian minimalistic design.

Consequently, the brand equity is reflected in these perceptions, preferences, and the behaviour related to aspects of the marking of the brand. Research has shown that a strong brand leads to greater revenue (Ailawadi, Lehmann, & Neslin, 2003).Based on the company's rise in sales, especially the two prior years, it is argued that both the company's heritage and current brand management strategy have enabled the establishments of a strong brand[7]. This has facilitated the company to break through the noise in the increasingly competitive and homogeneous industry and move beyond a competition based on price.

Conclusively, though the company have succeeded due to a strong brand a point of differentiation, arguing that these brand management capabilities are rare is farfetched. Yet, these capabilities are embedded in the organisation as it is built over time and the Volvo brand rely on a rich heritage of a clear corporate identity and focus, which is not considered substitutable or imitable.

6.3 Strategic Summary (SWOT)

The strategic summary is illustrated using the SWOT framework, as illustrated in table 8. The external analysis displayed a number of opportunities and threats to Volvo's ability to generate returns in the future. Increased political instability and negative views on free trade is highlighted as the biggest threat amongst the macro-economic factors. In addition, the industry is exiting a high growth period and is expected to see more modest growth the coming years. Substantial geopolitical risk is also identified, which might affect the

[7] There are numerous established models to evaluate the value of a brand (or brand equity). However, this it outside of scope for this thesis. Thus it is acknowledged that conclusions drawn in this sections might be partial.

company adversely as more protectionist agendas are realised. Moreover, the industry is experiencing a technological shift, where a few key technological trends that will re-shape the industry, namely, diverse mobility, autonomous driving, electrification and connectivity. Whether this is interpreted as a threat or opportunity is difficult to conclude. While it is possible to argue that this plays into the hands of Volvo's brand identity, it is totally dependent on Volvo's ability to develop the necessary competitive technology (with regard to both safety and environmental issues).

Table 8. SWOT analysis

Internal	**STRENGTHS** ▪ Brand identity in line with the industry trends ▪ R&D & Brand Management capabilities ▪ Strategic phase and positioning	**WEAKNESSES** ▪ Size o Economies of scale o R&D budget
External	▪ Strong growth in the Asia-Pacific region ▪ Capture a bigger proportion of the market share as the new technological landscape evolves **OPPORTUNITIES**	▪ New powerful entrants ▪ Increasing intensity of the five forces ▪ Modest aggregate growth ▪ Adverse development of macroeconomic factors ▪ Urbanisation **THREATS**

Source: Own construction

The five forces analysis revealed that the industry is likely to experience further pressure on the profit margins as five forces are expected to intensify. Further, economies of scale were identified as a very important factor in order to compete on a large scale. With respect to this, Volvo's relative size indicates significant disadvantages as compared to competitors. This is especially evident in terms of R&D spending, where investments are required to keep up as the technological landscape evolves.

A big question is whether Volvo will be able to compete in the new technology driven landscape. Though the company is identified as having strong R&D capabilities, the company's relatively weak economies of scale raise concern. However, as PwC (PwC Strategy&, 2016) find in their study, a big R&D budget is not a guarantee of generating innovations. One of the company's key strength's has been identified as its marketing capabilities, which will be tremendously important as they establish themselves as a premium AM. In addition, the "Volvo Way to Market" is in line with the consumer related technological trend by

searching new and more innovative ways to reach their customers. Volvo is also in a strategic phase where the company is capitalising on its investments due to the recent launch of several new models. This is expected to continue until the entire product range is renewed by 2019. The company is well positioned to consumer demands; with new SUV type of vehicles launched recently provide the company with promising outlooks.

7 Financial Statement Analysis

In order to understand Volvo's financial position and to forecast cash flows, it is necessary to assess the company's historical development and performance. The availability of data is limited to the last three years (2016-2014). This is due to the fact that Volvo engaged in a what is known as a "common control transaction" and re-adjusted the last three years to *fairly* reflect how to company will look like going forward. In line with the company's reasoning these years are selected for analysis. To compare Volvo's performance to that of its peers, the same years are applied for financial analysis.

The financial analysis focuses on the key drivers of value: profitability, growth and risk. By analysing the past, it is possible to establish whether the company has created value and grown, and how it compares with its competitors. The process of the financial analysis begins with re-organising the financial statements in reflect economic, instead of accounting, performance, which is the primary force behind the value creation in the company. Further, the adjusted financial statements will then be applied in the financial ratio analysis. This analysis will serve as a tool for mapping out Volvo's economic well-being and means to uncover different aspects of its performance and financial position *(Petersen & Plenborg, 2012)*. Conclusively, the financial analysis provides fundamental levels and trends in financials ratios that are used as inputs when forecasting.

7.1 Accounting policies

The financial analysis involves both time-series and cross-sectional analysis. However, associated with such analyses is 'noise' that weakens the representation of firm's underlying performance. One source of noise is the differences of accounting policies across and firms (Petersen & Plenborg, 2012). To ensure that differences in return measure firms are not attributed to changes in accounting policies, but rather to changes in underlying operation, it is necessary that the accounting policies are constant over time and across firms. This is especially important when a valuation is based on multiples, which compares accounting numbers from different companies.

The different geographical location of the companies involved in this study point to accounting differences; some companies are obliged to follow IFRS whereas others apply local versions of generally accepted accounting principles (GAAP). As an example of accounting differences, U.S GAAP allow for the application of last-in, first-out method for estimating inventory whereas it is prohibited by IFRS (Petersen

& Plenborg, 2012). Another key difference is whether development costs are allowed to be capitalised or not, which will be covered extensively in a later section. However, it is acknowledged that international accounting differences are rapidly becoming less of an issue (Koller et al., 2005). In addition, as the historical financial analysis is based on the three previous years and no major changes to accounting policies have been identified, any changes during the period likely have marginal effect. While this is recognised as a limitation to the accuracy of the analysis, the figures obtained are considered sufficient for valuation purposes.

7.2 Reorganising Financial Statements

This section is devoted to reorganising the accounting statements by separating financing and operating activities. Through this process, an analytical balance sheet and income statement is created that better reflect the capital invested in, and cash generated from firm operations. Further, additional adjustments regarding the treatment of R&D expenses and operating leases will be discussed. A balance sheet line item classification list following the outlining below is seen in appendix 3 and corresponding analytical financial statements for both Volvo and the peer group companies are seen in appendices 4 – 10.

7.2.1 Analytical Balance Sheet

The purpose of restating the balance sheet, through the separation of operating items from non-operating (financial) items, is to create a statement that show the assets and liabilities attributable to firm operations. This procedure will create two sides of the analytical balance sheet; one operational and one financial.

In the operating analytical balance sheet, operating working capital is obtained by subtracting operating current liabilities from operating current assets. The operating current liabilities are subtracted because it reduces the investment need and is seen as a free source of funding. Further, by subtracting total operating liabilities from total operating assets, invested capital (IC) is obtained. Invested capital is defined as the amount of capital a firm has invested in operations that requires a return (Petersen & Plenborg, 2012). In the financial analytical balance sheet, net interest-bearing debt (NIBD) is obtained by subtracting interest-bearing assets from interest-bearing debt. In turn, invested capital is obtained by adding total equity to net interest-bearing debt (Petersen & Plenborg, 2012).

Operating Analytical Balance Sheet

- *Operating current assets* are defined as the sum of working cash, inventories, accounts receivable, current tax asset and other current assets. Cash and cash equivalents is separated into two components, working and excess cash. As implied by this definition, only the proportion of total cash defined as working cash is deemed necessary for operations and thus accounted for in operating current assets. Volvo has held a cash and cash equivalents to turnover ratio of between

10-20% for the past five years. Failing to acknowledge the excess proportion will wrongfully depress the company's ROIC. Koller et al. (2005) estimated a minimum cash to sales ratio of non-financial companies in the S&P 500 to 2%, which is deemed a valid proxy.

- *Operating current liabilities* are defined as the sum of trade (accounts) payables, current provisions, current tax liability, advance payments from customers and other current liabilities. *Other current liabilities* are broken down in notes to disclose and account for any hidden financial items.
- *Non-current operating assets* are defined as the sum of property, plant, and equipment (PP&E), intangible assets, investments in joint ventures and associates, deferred tax asset and other non-current assets. Intangible assets comprise capitalised product and development costs, software, trademark and other intangible assets which all are considered instrumental to operations (Volvo Cars, 2015). Investments in associates and joint ventures are seen as part of operations. This as it is an important means for industry participants in order to tap into new sources of growth and technologies such as car sharing and joint R&D efforts. Further, in order to manufacture and sell on the Chinese market, industry participants are mandated by law to collaborate with a Chinese entity. Other non-current assets are broken down by investigating notes, thus separating operational and interest-bearing assets. In line with Petersen and Plenborg (2012), the deferred tax asset is defined as an operating item due to the vast majority of the deferred tax asset consisting of tax loss carry forwards and by not being able to distinguish whether the origin is financial or operational.
- *Non-current operating liabilities* consist of items such as other non-current provisions, other non-current liabilities and the deferred tax liability. The deferred tax liability is considered an operating liability following the same logic as the corresponding asset, thus ensuring consistency. Non-current provisions are recognised on the balance sheet as a response of a past legal or constructive obligation which is found probable to generate a material resource outflow in the future. This is deemed operational as it generally consists of warranty provisions to customers as well as being interest rate free (Petersen & Plenborg, 2012).

Financial Analytical Balance Sheet

- *Total equity* generally consists of share capital and minority interests. Minority interests arise when the parent company own less than 100% of the subsidiary. Petersen and Plenborg (2012) argue that minority interests are to be treated as equity capital as opposed to debt due to the higher required rate of return when valuing companies. They continue by highlighting the fact that in case of default, minority interests are ranked alongside equity holders, thus minority interests will be treated as equity.
- *Interest-Bearing Debt*. The most notable items are usually short and long-term debt. Often times financial items are hidden in other current and non-current liabilities, thus one has to break down those into notes to find items such as hedging instruments, interest payables and derivative

liabilities. Further, items such as retirement benefit plans and provisions for post-employments benefits exist due to that the company bearing the risk associated with future pay-outs. If these plans and benefits were fully funded, the corresponding asset would net them out to zero, but if they exist they are interest bearing and is therefore treated as financial items (Petersen & Plenborg, 2012).

- *Interest-Bearing Assets*. The most notable items are excess cash and cash equivalents, marketable securities and other long-term securities holdings. In addition, financial posts are often times included in other current and non-current assets and are treated as interest-bearing assets.

7.2.2 Analytical Income Statement

The analytical income statement is created by separating operating items from non-recurring and financing obtained to support the core business. The historical measures obtained, EBIT, EBITDA and net operating profit less amortisation and tax (NOPLAT), reflect the firms operating activities. By adjusting for capital expenditures (CAPEX), D&A and change in operating working capital, free cash flow to the firm (FCFF) is obtained.

Non-recurring events often times come in the form of restructuring costs, legal fees, impairment and the sale of investment assets and have to be adjusted for. Following the argumentation in the previous section, income from JV and associates is classified as operational. Further, when calculating the operating tax on the income statement one can either use the effective tax rate or the marginal tax rate. In the case of Volvo and its peers, the taxable income is sufficiently large (in most cases) to cover net financial expenses, thus the marginal tax approach is chosen to calculate operating tax (Petersen & Plenborg, 2012). However, often times, the corporate tax stated on the income statement includes tax shields from net financial expenses, which has to be corrected for in the analytical income statement. The tax shield is estimated by multiplying the net financial expense by the marginal tax rate for each individual company. Since Volvo and its peers all operate on a global scale, the global average tax rate of 23,62%.

7.2.3 Adjustments

When evaluating a company's performance from the outside, there are generally two adjustments that needs to be accounted for; operating lease payments and R&D expenses (Koller et al., 2005).

Operating leases represent the most common form of off-balance sheet debt (Koller et al., 2005). When firms choose to lease instead of borrowing and purchasing the asset, it only records the periodic rent associated with the lease on the income statement instead of recognising debt and assets on the balance sheet and interest payments on the income statement. This will lead to an artificially low operating profit and a corresponding artificially low value of the balance sheet. Therefore, to properly compare a company's

performance across companies and over time, it is critical (for consistency) to convert any operating leases to assets and debt (Koller et al., 2005).

R&D expenses are treated differently by different accounting standards; according to U.S SFAS 2 they are treated as expenses, whereas the development proportion of the expense is allowed to be capitalised according to IFRS. The reasoning behind treating R&D costs as expenses is that the outcome is very uncertain, and implicitly much riskier than investments in fixed assets which is allowed to be capitalised. However, the reason for the expense is no different than CAPEX, namely, to generate future economic benefits. Therefore, treating CAPEX and R&D expenditures differently in an technology intensive industry such as the automobile, will lead to an underestimated value of invested capital and thus overestimated ROIC as well as poor estimations of future growth (Damodaran A. , 2002). Though the reclassification leads to the removal of R&D expense on the income statement and adjusted amortisation added, it should not affect operating taxes since the R&D tax shield is real and directly related to operations. Thus the procedure will have no real effect on free cash flows and no influence in the valuation except in changing the perception of future growth opportunities (Koller et al., 2005). In addition to better metrics for valuation purposes, capitalising R&D expenses for the companies' subject to analysis offers a correction for the inconsistency generated by different accounting standards.

Recognising that these adjustments yield a more accurate measure of value and value creation, the lack of information (as often involved when valuing private companies) restricts the realisation of these adjustments. The fact that Volvo, offers three years of financial data with no information on future lease payments, the process of adjusting operating leases as discussed above is not possible. Hence, by not recognising operating leases in debt, there is no need to adjust free cash flow for operating leases, which results in consistency between free cash flow and the cost of capital. As capitalising intangible assets requires subjective assessments on amortisation periods, the limited availability of financial statements evidently imposes a problem on the assumed amortisation period. The relatively long product-life cycle in the industry would argue for an amortisation period longer than three years, which would clearly yield more valid adjustments. Hence, the results presented are raw results without the capitalising of R&D and operating leases. As a result, return on invested capital (ROIC) will be up-ward biased given that the automobile industry has significant intangible assets. The effect of not capitalising operating leases is the same, though likely to a less extent as the requirements for classification of leases into operating or finance leases are conceptually similar under both account standards (IFRS and U.S. GAAP) (Koller et al., 2005). In summary, in this context, the drawbacks of not adjusting for these items across the whole group of companies are considered superior than converting and adjusting for a few.

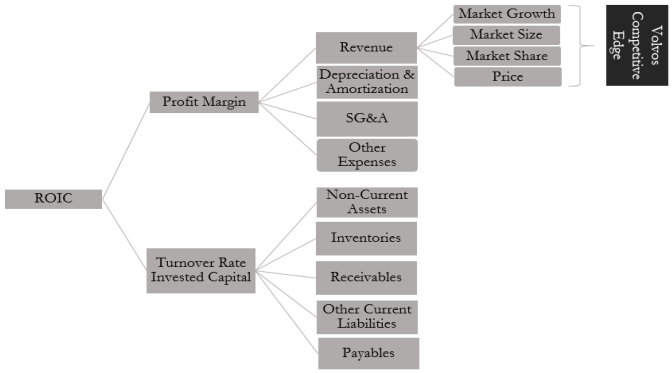
7.3 Financial Ratio Analysis

7.3.1 Profitability & Growth

Measuring a company's profitability is one of the key areas of financial analysis, as historical profitability is an important element in defining the future expectations for a company (Petersen & Plenborg, 2012). Moreover, the financial performance will be benchmarked against peers, which provides a better indication of the historical and relative financial situation of Volvo. The profitability ratios are based on the previous analytical income statement and balance sheet. ROIC will be measured using both average and ending values of invested capital in order to capture any extraordinary events that might have led to an under or overestimation of invested capital during the period. It is important to get true measures of ROIC since it is a very significant measure from a valuation perspective because to, all other things equal, a higher ROIC leads to a higher value of the firm (Petersen & Plenborg, 2012).

The structure for the profitability analysis will follow the DuPont Model, introduced in 1912 by the DuPont corporation and is illustrated in figure 20 (Philipps, 2015).

Figure 20. DuPont model



Source: Adapted from (Petersen & Plenborg, 2012)

The model decomposes ROIC[8] into two components, turnover rate of invested capital[9] and profit margin (also referred to as operating margin). This separation aids finding out whether the profitability is driven by an improved ability to utilise invested capital or a more attractive revenue and expense structure. Both the turnover rate of invested capital and profit margin are positively related to ROIC (Petersen & Plenborg, 2012). This analysis will start by a break-down of the profit margin followed by the turnover rate of invested capital.

[8] $ROIC = \frac{NOPLAT}{Invested\ capital}$

[9] $Invested\ capital\ turnover = \frac{Sales_t}{Invested\ capital_t}$

Calculations of ROIC (after tax) based on both the ending value and average value of invested capital is seen in figure 21. By comparison, the levels of ROIC depending on which measure of invested capital is used one can conclude that there is little difference for the years 2015 and 2016. Thus, ending capital ROIC is considered a good measure for benchmarking Volvo's ability to generate return. With the exception of 2014, Volvo has delivered the highest ROIC amongst the companies in the sample and delivered a ROIC of 25,2% in 2016, as compared to the peer group average of 7,8%. This indicates that Volvo has been relatively successful in generating returns in the near history.

In addition, Volvo show a substantially positive trend, with a ROIC of 5% in 2014 as compared to 25,2% in 2016. In exception for Fiat Chrysler and Mazda who show positive trends, the rest of the peer group show no clear trend in either direction and volatility is low.

Figure 21. Company ROIC

Figure 22a. Average Invested Capital

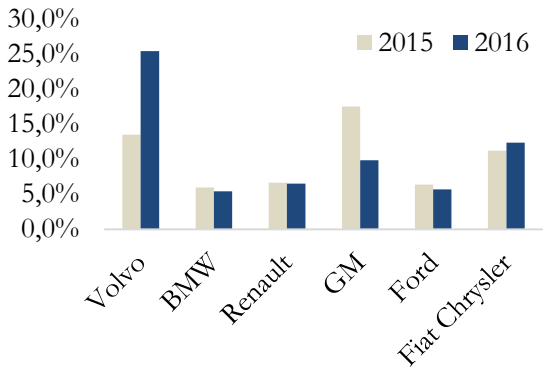
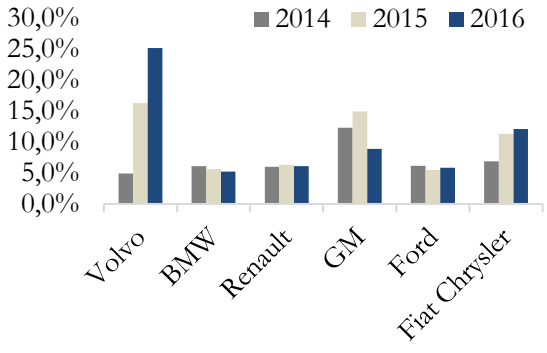


Figure 22b. Ending Invested Capital



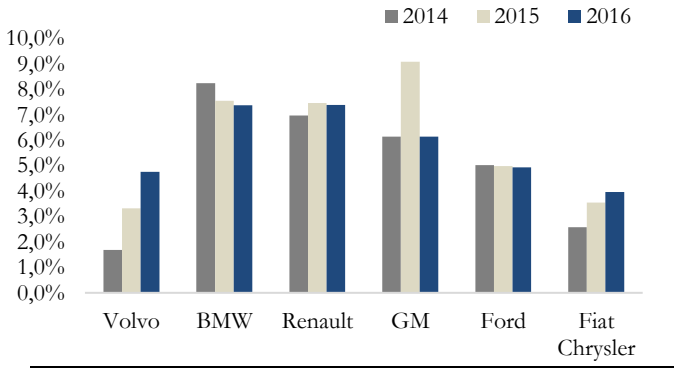
Source: Constructed by the authors

As stated in the adjustments section of the financial statement analysis, by not accounting for operating leases and allowing for R&D to be treated differently depending on accounting standards, the companies following IFRS accounting standards make a better basis for benchmarking against Volvo. In general, goodwill accounts for a very small proportion of invested capital for the peer group companies and thus have a marginal effect on ROIC with one exception, Fiat Chrysler (42%), and therefore any inference based on Fiat Chryslers performance will be made with caution.

Profit Margin

Figure 22 show the profit margins for Volvo and its peers. It reveals that, as expected from the five forces analysis, profit margins are relatively low. Average margins for the peer group companies are 5,7%, 6,4% and 5,9% during the period of analysis. As seen in the figure, Volvo has consistently delivered profit margins lower than those of the peer group, even though the company has improved the most during the period.

Figure 22. After tax profit margin



Source: Constructed by the authors

Despite the time period being too short to draw any substantial conclusion based on time series data, the main components of the profit margin will be indexed to reveal more information on how Volvo has improved its profitability as compared to the comparable companies (Petersen & Plenborg, 2012). The indexed line items are to be interpreted with caution as the comparable companies' record D&A by function and does not disclose the distribution. Thus, the cost figures presented are likely inflated relative to Volvo's, decreasing the reliability of the analysis.

Table 9. Revenue per unit

	2014	2015	2016
Revenue (€ Million)	14.288	17.035	18.761
Unit Sales (000's)	466	503	534
Revenue per unit (€)	**30.670**	**33.858**	**35.111**

Source: Own compilation, Volvo Annual Reports

Volvo's revenues have grown at a CAGR of 14,6% which is to be compared with the peer group average of 11,3% (see appendix 11). This relatively high growth is due to both an increase in units sold and in revenue per unit as displayed by table 9, which is in line with the strategy to become established in the premium segment. During the same period, cost of sales has grown at a lower rate than revenues, which has created a CAGR in gross profit of 25,2% as compared to the peer group of 15,4%. R&D expenses and SG&A have also increased at a lower rate than revenues, thus contributing positively to the profit margin. The only post increasing at a faster pace than revenues is D&A, which is in line with Volvo having made big investments during the period. Compared to its peers, Renault, GM and Fiat Chrysler have been able to increase revenues at a higher rate than cost of sales but GM is the only one that has been able to do so at a comparable level.

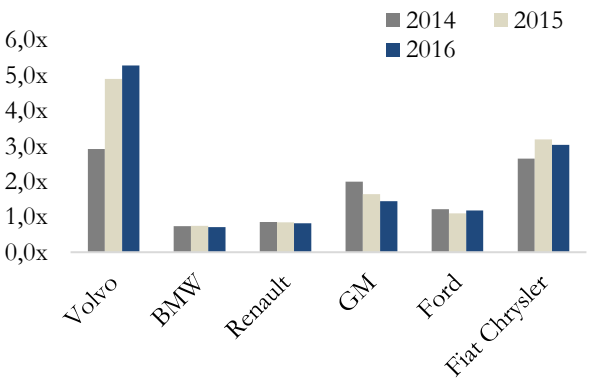
These findings are supported by investigating common size figures and show that Volvo has been able to decrease the cost of sales, SG&A and R&D expense whereas D&A has increased as a percentage of revenue (appendix 11). The decrease in cost of sales is the strongest contributor to the growing profit margin. However, the analysis also shows that there is room for improvement in cost management as SG&A is relatively high compared to the peer group. Noteworthy is that these figures are excluding D&A, whereas for the peers D&A is likely included in SG&A potentially inflating the relation to revenues.

In conclusion, it is unquestionable that Volvo has been successful in creating value the recent years by both increasing revenue and decreasing marginal cost, thus delivering superior growth in all measures of profitability. However, the margins are still relatively low compared to the peer group, which implies that there is room for improvement with regards to the company's cost management.

Invested Capital Turnover Ratio

Turnover rate of invested capital is seen in figure 23 and reveals that Volvo has not only improved its turnover rate of invested capital the most, but that it has by far the highest. It also shows that the four companies with the highest ROIC, Volvo, GM, Fiat Chrysler and Mazda also have the highest turnover rates. Thus, the turnover rate of invested capital is a very important source of superior ROIC in the industry. Whilst the average turnover rate of invested capital has been stable at 1,7x, Volvo has increased from 2,9x to 5,3x over the last three years.

Figure 23. Turnover rate of invested capital



Source: Constructed by the authors

This implies that the number of days that Volvo's invested capital is tied up has decreased from 123 to 68 during the period (Assuming 360 days in a year), as compared to the increase in peer group average from 210 to 214. Thus, Volvo has been able to improve substantially from already low levels.

A common size analysis on the analytical balance sheet items show that most significant current assets are accounts receivable and inventories, whereas the largest non-current assets are PP&E and intangible assets (see appendix 12). With respect to assets, Volvo show a decrease relative to sales but there is no major trend in the data. On the liabilities side, the most significant posts are accounts payable and both other current and non-current liabilities. The decrease is bigger on this side (measuring liabilities as negative values), ultimately leading to operating working capital decreasing from -11,6% to -18,7% of sales. The fact that Volvo's operating working capital is negative has a big part in explaining Volvo's relatively high invested capital turnover ratio due to most competitors showing near zero or substantially positive working capital.

The underlying reason to how Volvo has managed to decrease the invested capital turnover ratio becomes clearer when looking at the days on hand (appendix 12). Volvo has managed to utilise its assets more efficiently every year and show decreasing days at hand across the line, but the biggest improvements are made in operating working capital, as implied by the previous reasoning. Further, Volvo is in the lower segment of days on hand regarding all line items, explaining how they have been able to show a substantially higher invested capital turnover ratio relative to peers.

In conclusion, when looking at invested capital turnover, Volvo is outperforming its peers mainly due to tighter management of current liabilities, driving down operating working capital and thus invested capital.

7.3.2 Liquidity Risk

Liquidity is a crucial subject for any business. Assessing the company's liquidity is important since the lack of it may lead to loss of business opportunities, and in a worst case, suspension of payments (Petersen & Plenborg, 2012). The liquidity risk analysis will consider both the short-term risk (the company's ability to meet all short-term obligations) and the long-term risk (the company's ability to meet all future obligations).

Short-Term

Volvo's short-term liquidity risk is analysed by examining the current ratio[10], liquidity cycle[11], and quick ratio[12]. The concept of the current ratio is to assess whether a company's short-terms assets are readily available to meet the short-term liabilities obligations, where in theory a higher ratio is better. Table 10 show short-term liquidity risk measures. As seen in the table, the current ratio has been steadily improving over the past three years. However, as it often takes time to convert working capital assets into cash to pay current liabilities, quick ratio is used to complement the analysis as it a more conservative metric that excludes the impact of inventory. In other words, the quick ratio only includes the most liquid current assets that can be used to pay down short-term debt (Petersen & Plenborg, 2012). The quick ratio is significantly lower than the current ratio, indicating that Volvo's ability to finance its short-term debt is highly dependent on inventory.

[10] $Current\ Ratio = \frac{Current\ Assets}{Current\ Liabilites}$

[11] $Liquidity\ Cycle = \frac{360}{\frac{Cost\ of\ Sales}{Inventory}} + \frac{360}{\frac{Revenue}{Accounts\ receivable}} - \frac{360}{\frac{Cost\ of\ Sales}{Accounts\ payable}}$

[12] $Quick\ Ratio = \frac{Cash+Marketable\ Securities+Receivables}{Current\ Liabilites}$

Table 10. Short-term liquidity risk

	2014	2015	2016
Current Ratio	0,92	0,95	1,04
Quick Ratio	0,48	0,57	0,68
Liquidity Cycle	17	2,7	-6

Source: Own compilation

To determine whether these ratios are at a satisfying (or adequate) level it is important to consider the industry and the business model of companies. Automakers or manufacturing industry in general, often have large inventories and as a result it is difficult to apply a rule of thumb, say a current ratio greater than 2, which would indicate low short-term liquidity risk (Petersen & Plenborg, 2012). In 2016, the average current ratio of the company's peers was 1,08. Comparing Volvo's ratio to that of its peers indicates that the company has a higher short-term liquidity risk. However, this conclusion does not consider the time it takes to convert operating working assets into cash. Therefore, to avoid being misled by these ratios, a ratio that takes the time perspective into account is important.

The liquidity cycle, or cash conversion cycle (CCC), tells in how many days working capital is converted into cash. Since inventory and receivables consume cash (use of funds) while payables generate cash (source of funds), the fewer the days it takes to convert working capital into cash the better the cash flow (Petersen & Plenborg, 2012). As seen in the table, there is a positive trend in the liquidity cycle that adds to Volvo's liquidity. The trend is a positive indicator of the company's efficiency in managing its working capital assets and implies that the company is improving at converting its working capital into cash flows.

In isolate, current ratios or quick ratio does not reveal the whole picture of the future liquidity risk for the company. It is therefore more interesting to look at the trend in these figures. Volvo's ratios have continuously increased which signal a decreasing short-term liquidity risk. The current ratio is now on a level slightly above one, revealing that the company's current assets cover its current liabilities. However, the decreasing CCC indicates a positive trend in the company's ability to meet short-term liability obligations, in other words greater liquidity. For example, inventory is held up fewer days indicating a demand for the company's products which has a positive effect on cash flows. The overall conclusion is that there is little reason for concern that Volvo being able to cover its short-term liabilities, thus the short-term liquidity risk is deemed low.

Long-Term

The long-term liquidity risk will be measured by two of the most frequently applied ratios: financial leverage[13] and the interest coverage ratio[14] (Petersen & Plenborg, 2012).

In general, a high financial leverage indicates higher long-term liquidity risk. However, as discussed by Petersen and Plenborg (2012), there reason for concern when calculating financial leverage based on book values of equity rather than market values. Table 11 shows the long-term liquidity risk measures for Volvo. The table illustrates a marginally increasing financial leverage ratio during the period, which implies higher long-term liquidity risk. At the same time, the interest coverage ratio has improved dramatically, and as discussed in the financial analysis section, company ROIC has improved substantially.

Table 11. Long-term liquidity risk

	2014	2015	2016
Financial Leverage	2,6	2,8	2,7
Interest Coverage Ratio	3,4	5,5	7,8

Source: Own compilation

This indicates that the book value of equity is underestimating the true value of equity, and thus inflates the financial leverage. To assess whether the company display any long-term liquidity risk concerns, these ratios are compared to industry benchmark. Based on book values, the average financial leverage ratio for peers has been in interval 5,6 to 5,18 over the past three years, which is well above Volvo's, thus the company display no significant concerns. The interest coverage ratio measures the company's ability to meet its net financial expenses; more specifically the ratio expresses how many times operating profit covers net financial expenses. Comparing the interest coverage ratio with the peer group, it is well below average (see peer group analysis). However, the ratio has increased considerably over the last couple of years as EBIT has improved, indicating a decrease in the long-term liquidity risk. In conclusion, the trend for the long-term liquidity risk measures signals no dramatic changes that would affect the long-term liquidity risk. The company demonstrates high solvency, thus the risk is deemed to be at an intermediate to low level and raises no major concerns going forward.

In sum, even though Volvo does not have what can be considered a strong financial position, it is rapidly improving and therefore raises no major concerns regarding the company's ability to facilitate its debt.

[13] $Financial\ Leverage = \frac{Total\ Liabilities}{Equity}$

[14] $Coverage\ Ratio = \frac{Operating\ profit}{Net\ finanical\ expenses}$

PART IV: STAND-ALONE VALUATION: IPO

This part will, first of all, based on the strategic and financial analysis, estimate the future performance of the company. Secondly, it will estimate a cost of capital that best reflects the risk associated with the company's cash flows. Thirdly, the value company's operation will be estimated, on a stand-alone basis. The value will be derived through both a DCF and EVA analysis, as well as a comparable companies analysis.

8 Forecasting

This section will, based on the identified strategic and financial value drivers of Volvo and its sector, build pro forma statements that reflect the company's expected performance. This involves changing the perspective from a historical to a forward-looking view. These projections are based on the linkage between the strategic and financial value drivers as illustrated in figure 24. This linkage suggest that it is the strategic and operating performance of a company that affects the financial value drivers, and as a result, strategic or operational initiatives affect cash flows and the value of the firm (Petersen & Plenborg, 2012).

Figure 24. Linkage between value drivers and firm value

Source: (Peterson & Plenborg, 2012)

The design of the pro forma statements will be based on a sales-drives forecasting approach (top-down), reflecting that different account items such as operating expenses and investments driven by the expected level of activity. An alternative to this approach is a 'line-item' approach where each accounting item is forecasted. However, in accordance with Peterson and Plenborg (2012), this approach lacks the adequate link between the expected level of activity and the related expenses and investments. The forecast focus on the on-going operation of the company and excludes non-operating and non-reoccurring items due to the transitory nature of these items.

The forecasts and the developed pro forma statements for Volvo will be estimated under a "business as usual" scenario. Under this scenario, the industry experiences no major shocks and Volvo continues to grow organically.

8.1 Budget Period

Determining the length and detail of the forecast is imperative. The typical approach is to make a distinction between the *explicit forecasting period,* where financial value drivers are not assumed to be constant, and the *terminal period* (continuing-value), which reflects the 'steady state' environment and assumes that financial value drivers remains constant. As a continuing-value approach assumes a steady-state

performance, therefore the explicit forecast period must be long enough for the company to reach a steady state (Koller et al., 2005). The number of years for the forecasting period is dependent on the growth profile of the company. Koller et al. (2005) recommend using a forecast period of 10 to 15 years for most firms, though high growth companies or cyclical businesses may need an even longer time to reach a relatively mature stage.

In a study by Petersen et al. (2006), the authors asked investors and corporate financial advisors of the forecasting period when valuing private companies with the answer of a range between 2 and 12 years, and an average of 7 years. Several participants pointed out that 'preparing sensible forecasts for longer than ten years is impossible' (Petersen et al., 2006, p. 8). Conclusively, practitioners mentioned adjustments for the type of business and indicated that mature firms require a shorter forecast horizon than firms with high growth as due to the environment of modest growth rates. Though Volvo has grown considerably the last couple of years, this growth is expected to mature within a relatively short time frame as the company operates in a mature industry, where the aggregate market grows slowly and is closely tied to economic growth.

As already discussed, the process of developing a set of projections is invariably easier when valuing a public company as opposed to a private company due to the availability of information. For this reason, it is concluded that a two-stage approach with a forecasting horizon of 10 years is appropriate. Due the uncertainty of forecasting each line item, the ten years are divided into an explicit forecasting period of 5 years with relatively strong growth and a simplified forecast for the remaining years.

Following, the majority of the projections developed in this section will therefore to a large extent rely on the information derived from peers and conversion towards the auto industry in aggregate. As a result, the simplified pro forma statements will emphasis aggregate results, which means, for example, that future ROIC will be matched against Volvo's competitive advantage rather than focus on individual line-items. To ensure the steady-state assumption, each variable in the pro forma statements in the terminal period grows at the same constant rate (more on this rate in section 10.4).

8.2 Pro Forma Income Statement

Revenues

Volvo operates in a mature industry where the aggregate market growth is closely tied to economic growth and other long-term trends. However, the strategic decision some ten years ago to move into the premium car segment has reached the stage where the company is now capitalising on its investments and is showing promising signs in terms of profitability and volume growth. The positive trend is supported by the increasing demand for premium cars and especially SUVs, which to a large extent is a key success factor for the company. This has resulted in a growth stronger than the industry the last two years. Estimated sales are expected to grow based on the following drivers: price, unit growth, and geographical region growth.

The estimates will be closely tied to Volvo's key markets development, both in terms of economic progress but also consumer preference trends. In technical terms, each year's revenue equals the prior year's revenue grown at a projected growth rate, which is determined by the sum of volume growth and price/mix changes.

It is expected that Volvo's underlying volume growth for the next four years represents an annual growth rate of 9,7%, which is stronger than the 4,1% of the overall industry. Whilst the North American and European markets are mature, growth is expected around the global average with annual growth rates close to 4% and 4,4% respectively over the coming four years. The Asian-Pacific market is still characterised as growth markets with continued strong estimated GDP growth. In Sweden, Volvo has a strong presence and future sales are expected to grow in line with previous years' strong growth as the company continue to capitalise on their strong brand equity and the "home bias" briefly mentioned. In aggregate, volumes and revenues are expected to be driven by the global consumer trend of moving into the premium car segment and the SUV's and crossover segment.

The strong growth over the next few years is not considered exceptional given the company's competitive advantage, its relative size (in other words its ability to more easily capture market shares), and its current momentum. Volvo has consistently increased sales, productivity (operational efficiency) and profitability the last couple years. In addition, the company has positioned itself in a capitalisation phase where investments in new plants, products and the ability of launching successful marketing campaigns are expected to bear fruit. Moreover, the company's rich history and reputation as well as current positioning captures the current consumer trends and government regulations (focus on safety and fuel efficient engines) puts the company in the front seat when it comes further advancements.

By 2021 revenues are expected to decrease as interest rates has like reached higher levels, not providing the motivation for large purchases as during the current interest rate environment. The decrease in revenue growth will also be driven by changing consumer behaviour due to urbanisation, such as the increasing need for a development of infrastructure (public transportation) which likely affects affect the automotive industry negatively. Moreover, as discussed in the strategic analysis, barriers to entry is expected to decrease which might fade the company's competitive advantage and by the end on the forecasting period, it is assumed that in five years' time, Volvo is an established premium car manufacturer and grow in line with rest of its competitors. Table 12 depict the revenue assumptions made in this section.

Table 12. Revenue assumptions

Historical Value Drivers				Forecasted Value Drivers									
	2014	*2015*	*2016*	**E2017**	**E2018**	**E2019**	**E2020**	**E2021**	**E2022**	**E2023**	**E2024**	**E2025**	**E2026**
Price per Unit Growth													
Revenue (€ Million)	14.288	17.035	18.761										
Unit Sales (000's)	465,9	503,1	534,3										
Revenue per unit (000's €)	**30,67**	**33,86**	**35,11**	**36,16**	**36,89**	**37,63**	**38,38**	**39,15**	**39,93**	**40,73**	**41,54**	**42,37**	**43,22**
Growth		*10,4%*	*3,7%*	*3%*	*2%*	*2%*	*2%*	*2%*	*2%*	*2%*	*2%*	*2%*	*2%*
Region Growth													
Western Europe		8,7%	4,1%	5,0%	5,0%	5,0%	5,0%	5,0%					
China		0,0%	11,5%	12,0%	12,0%	10,0%	8,0%	9,0%					
Sweden		16,0%	-1,3%	7,0%	7,0%	7,0%	7,0%	7,0%					
U.S.		24,3%	18,1%	15,0%	14,5%	13,7%	14,0%	14,0%					
Other Markets		-2,6%	2,5%	4,0%	4,0%	3,0%	3,0%	3,0%					
Growth		*8,0%*	*6,2%*	*7,8%*	*7,4%*	*7,0%*	*6,9%*	*3,1%*	*2,0%*	*1,0%*	*1,0%*	*1,0%*	*1,0%*
Region Sales (000's units)													
Western Europe	182	198,0	206,1	216,5	227,3	238,6	250,6	263,1					
China	82	81,6	90,9	101,8	114,1	125,5	135,5	147,7					
Sweden	61	71,2	82,7	94,3	107,5	122,6	138,5	153,7					
U.S.	56	70,0	70,3	75,2	80,4	86,1	92,1	98,6					
Other Markets	84	82,2	84,3	87,6	91,1	93,9	96,7	99,6					
Total	**466**	**503,1**	**534,3**	**575,4**	**620,4**	**666,6**	**713,4**	**762,7**	**777,6**	**785,3**	**793,0**	**800,7**	**808,6**
Net Revenue (€ million)	**14.288**	**17.035**	**18.761**	**20.804**	**22.860**	**25.004**	**27.292**	**29.874**	**31.069**	**32.001**	**32.961**	**33.950**	**34.969**
Revenue Growth		**19,2%**	**10,1%**	**10,9%**	**9,9%**	**9,4%**	**9,2%**	**9,5%**	**4,0%**	**3,0%**	**3,0%**	**3,0%**	**3,0%**

Source: Computed by the authors

Operating Expenses

For each operating expense on the income statement, such as cost of sales, SG&A and R&D expenses, forecasts are based on revenue as recommended by both Koller et al., (2005) and Petersen & Plenborg (2015). Table 13 display the breakdown of value drivers, both in the explicit period and the condenses forecasting period.

Volvo's cost of sales has fluctuated between 75% and 80% of revenues the last three years, so has the peers' ratio as well (average 80%). As the demand for new cars continues globally, it is estimated that prices on production inputs (raw materials) to increase slightly. However, this is expected to have no material effect on the gross margin as this relationship have remained fairly constant over time for both Volvo and its peers. Acknowledging that suppliers will eventually influence the gross margins as their bargaining power will increase, a material shift in margins is not expected to take place within the foreseeable future. Hence this ratio is expected to remain at current levels in the explicit period. For the period beyond 2021, it is expected that cost of sales remain as a constant percentage of revenue at 78%, dropping the gross margin to 22%.

Table 13. Pro forma income statement assumptions

Historical Value Drivers	Forecasted Value Drivers										
Financial Drivers	***2016***	**E2017**	**E2018**	**E2019**	**E2020**	**E2021**	**E2022**	**E2023**	**E2024**	**E2025**	**E2026**
Revenue Growth	**10,1%**	**10,9%**	**10,0%**	**9,6%**	**9,2%**	**9,1%**	**4,0%**	**3,0%**	**3,0%**	**3,0%**	**3,0%**
Cost of Sales % of revenue	76,0%	75,0%	75,0%	76,0%	76,0%	77,0%					
Gross Margin	**24,0%**	**25,0%**	**25,0%**	**24,0%**	**24,0%**	**23,0%**	**22,0%**	**22,0%**	**22,0%**	**22,0%**	**22,0%**
SG&A % of revenue	10,0%	10,5%	10,5%	10,0%	10,0%	10,0%					
R&D % of revenue	2,9%	2,9%	2,9%	3,0%	3,0%	3,0%					
Other income/expense (net) % of revenue	0,8%	0,5%	0,5%	0,5%	0,5%	0,5%					
Income from JV & Associates % of revenue	0,2%	0,2%	0,2%	0,2%	0,2%	0,2%					
EBITDA margin	**11,9%**	**12,3%**	**12,3%**	**11,7%**	**11,7%**	**10,7%**	**10,5%**	**10,5%**	**10,5%**	**10,5%**	**10,5%**
D&A % of tangible and intangible assets	14,4%	13,0%	13,0%	13,0%	13,0%	13,0%	12,0%	12,0%	12,0%	12,0%	12,0%
EBIT margin	**6,1%**	**7,3%**	**7,3%**	**6,7%**	**6,7%**	**5,5%**	**5,2%**	**5,2%**	**5,1%**	**5,1%**	**5,1%**
Tax Rate	21,6%	23,6%	23,6%	23,6%	23,6%	23,6%	23,6%	23,6%	23,6%	23,6%	23,6%
NOPLAT	**4,8%**	**5,6%**	**5,6%**	**5,1%**	**5,1%**	**4,2%**	**4,0%**	**4,0%**	**3,9%**	**3,9%**	**3,9%**
Net Financial Expenses Before Tax (% of NIBD)	16,5%	6,5%	6,5%	6,5%	6,5%	6,5%	6,5%	6,5%	6,5%	6,5%	6,5%
Profit Margin	**4%**	**5,1%**	**5,1%**	**4,6%**	**4,6%**	**3,6%**	**3,3%**	**3,3%**	**3,1%**	**3,1%**	**3,1%**

Source: Constructed by the authors

SG&A has historically accounted for roughly 10% of revenues. As the company is expected to grow considerable the nearest years, SG&A costs related to this expansion is expected to slightly increase. As leveraging its brand, especially via strong marketing, is an important part of Volvo's success it is expected that this ratio remains in the interval of 10-11% of revenues, which is somewhat above industry average (8,5%).

In line with the previous reasoning on the treatment of R&D expenses, research costs are the proportion of the R&D costs that are considered operational and will be continued expensed as incurred. Historically these costs have been roughly 3% of revenues and moving forward costs are estimated to remain in this interval. Because of the rapid technological changes and shifts in the automotive industry, it is expected that these costs will gradually increase to meet the demands of the market.

Depreciation & Amortisation

As the company does not disclose any detailed separation of D&A, but rather report the total sum, and its lumpy nature of investments (capital expenditures), D&A is forecasted as a percentage of tangible and intangible assets. This is considered the superior method as it reflects the direct ties between a particular assets and depreciation, opposed to using revenue as forecast driver (Koller et al., 2005). Historically, this ratio has fluctuated between 12% and 14%. It is assumed that the relationship between D&A and tangible and intangible assets continue to remain in this interval in line with recent years and the industrial nature of the business. In time it is estimated that this ratio stabilises at 12%, implying an average D&A period of approximately 8,3 years.

Other Income Statement Items

- *Net Other Operating Income/Expense.* Historically, net other operating income as a percentage of revenues has fluctuated between -1,3% and 0,8%, illustrating no particular trend. It assumed that this ratio remains as at a constant 0,5% level of revenue.

- *Income from Joint Ventures and Associates*.. Historically the income from these sources as a percentage of revenue has been stable at 0,2%. As there are no indications of change, it is assumed to that this ratio remains as a constant 0,2% of revenues.
- *Net financial expense* is estimated as a percentage of NIBD as suggested by Petersen and Plenborg (2012). Since Volvo's historical measures provides no or little guidance as to how this proportion will look going forward, the estimate will be based on the current depository market rate and the company's cost of debt. Due to the fact that NIBD is forecasted, the distribution of interest-bearing assets and interest-bearing debt is not disclosed which ultimately leads to uncertainty in the estimate. However, the market rate on depositions in the company's legal homestay (Sweden) is zero and the cost of debt is 3,5% (See cost of capital). In order to account for the uncertainty, a 3% mark-up on company cost of debt is applied, thus estimating net financial expense as a percentage of NIBD at 6,5%.
- *Tax rate.* Volvo generates revenue from all different regional parts of the world, which exposes to the company to different national tax laws and different marginal tax rates. Considering this, the average global corporate marginal tax rate of 23,62% will be applied for tax allocations (Damodaran, A, 2017a) . Historically the effective tax rate has been close to this tax rate, with the exception of year 2014 (56%). This tax rate is applied on both operating income and net financial expenses.

For the years 2022 to 2026 a more streamlined model is applied, where only core value drivers such as EBITDA margin and EBIT margin are forecasted. It is assumed that Volvo reaches a steady state, with constant growth and margins, in 2024.

- *EBITDA margin* is expected to somewhat as decrease towards the end as operating expenses is likely to increase. First of all, gross margin will likely decrease as the bargaining power between suppliers and the company (and the industry as a whole) will structurally change. As already discussed, the more advanced inputs from suppliers is expected to put pressure on margins. In addition, heavy investments in R&D and marketing to keep up with government regulation, consumer trends and preferences is projected to be necessary, all of which negatively impacts EBITDA. As a result, EBIT margin is expected to decrease as towards the industry average of 5,3% (Damodaran A. , 2017b)

8.3 Pro Forma Balance Sheet

Non-Current Assets

Investments in intangible and tangible assets (CAPEX) is dependent on the capital intensity of the industry and company specific strategies. As mentioned in the strategic analysis, the auto industry relies to a large extent on investments in tangible and intangible asset (very capital intensive). As such, investment in these assets is a necessity for survival. Looking historically, the peer group has on average dedicated 5% of

sales to investments in intangible and tangible assets (important note is that this figure might be supressed due to the different accounting standards). Volvo has previously left a period where the company invested more heavily than ever before, with as much as 37% of revenues in 2014. As a result, investments over the coming few years is expected to somewhat slow down. Generally, companies in the industry gradually invest in intangible and tangible assets and therefore investments are forecasted as a percentage of revenue.

In 2016, intangible and tangible assets accounted to for roughly 40% of revenues. Going forward, it is expected that this relationship decrease slightly to 38% over the next coming five years. Beyond this point it is predicted that this ratio increases due to industry changes, stricter government regulation and consumer demands. In technical terms, CAPEX is calculated as the difference between intangible and tangible assets at the end and at the beginning of the period plus D&A during that period. In this case, there is also non-current operating liabilities, to take this into account CAPEX is adjusted by adding the difference between ending and beginning value as it implies a free source of funding. The investments over the entire period corresponds to an average CAPEX as percentage of revenue of 8,3%, coming down from 12% in 2016. The ratio is somewhat higher than the average of the industry. However, this is considered a necessity for Volvo given their relative size so in order to remain competitive, a higher investment rate is required.

Other Non-Current Assets

- *Other non-current assets* as a percentage of revenue display no trend historically. Therefore, forecast of this ratio is reliant on the most previous year. As such, it is predicted that it remains as a constant 1,5% of revenue.
- *Deferred taxes.* Historically the ratio between deferred tax assets and revenue has been stationary around 2%, looking forward it is assumed that it remains as a constant 2%.
- *Investments in Joint Ventures & Associates* has been fairly stable. Between 2014 and 2015 the ratio between the investments in JV and associates and revenue was 0,4%, whereas in the most recent fiscal year the ratio increased to 1,4%. Given that the auto industry is closely associated to such investments, the ratio is expected to remain at the somewhat higher level (as in 2016).

Working Capital

Over the last couple of years, Volvo's has financed its immediate operations due to large increase in its accounts payables as a result of the increased demand and recent growth of the company. Though negative working capital might indicate issues to make ends meet and having to rely raising new capital to finance operations, this is not considered a concern of Volvo as the company have excess cash (not included in the operating working capital) to cover obligations to vendors. Like many companies in the automotive industry, Volvo's business model when it comes to manufacturing of cars is based on the built to order model (Volvo Cars, 2015). This means that inventories can be held at low levels and the company has relatively few receivables to advance, the company can operate with negative working capital. In other words, collecting

cash up-front but paying suppliers later has been a way of expanding the business. Between 2014 and 2016, net working capital decreased (increased in absolute terms) from -11,6% of revenues to -18,7%, maily driven by an increase in trade payables. Investments in working capital is defined as net working capital and is calculated as the ending value of working capital less the beginning value.

Negative operating working capital is not uncommon; Damodaran (2017c) separate working capital ratios by sector and find an industry average in the U.S. of -2,4%. This is likely the result of the power of these large companies' when demanding longer credit period from their fragmented suppliers. Since the acquisition by Zhejiang Geely Holdings in 2010, the company started searching for ways to manage and optimise its working capital performance. The solution was found in a new supply chain finance (SCF) system implemented by the company (treasurytoday, 2016). Central to this was optimising the liquidity cycle, which has been considerably lower than the average of peers (appendix 13). This demonstrates the company's strength of employing short-term assets and abilities to generate cash for the company. Since revenues are growing and expected to continue doing so, the positive effects of a negative working capital position is expected to endure.

In the explicit forecasting period, working capital is decomposed into operating current assets (including line items) and operating current liabilities (including line items). Each of the line items under respective heading is forecasted as a percentage of revenue, as suggested by Koller et al, (2005) and Petersen & Plenborg (2015). Table 14 display each line item as a percentage of revenue. The ratios between working capital items and revenues have been set to reflect historical values and future expectations. For example, it is expected that the company maintain its inventory holding period. Overall, it is assumed that this way of operating, negative working capital balance, will continue going forward reflecting the company's ability to resist pressure for faster payments from outside suppliers. Over the long run, the working capital is expected to somewhat deteriorate (increase) due to factors identified in the strategic analysis.

NIBD

In 2016 the company held a negative NIBD of €0,942bn which is primarily explained by the company's cash position where cash and cash equivalents amounted to approximately 24% of total assets and 21% of revenues. Given the 2% assumption of operating cash, this yields a substantial excess cash item amounting to €3,637bn on the analytical balance sheet. This more than covers the company's €3,195bn in interest-bearing debt, and by adding the remaining financial assets of €0,5bn, the substantially negative NIBD is obtained (appendix 4). The company does not provide any guidance as to how these excess funds will be utilised going forward, but given the target capital structure derived in a later section on cost of capital. However, as Koller et al (2005) highlight, excess cash and newly issued debt does not impact the value of the firm as the effect of capital structure is captured in company cost of capital and not forecasted

balance sheet items. Thus, to obtain the target capital structure in 2017, Petersen and Plenborg's (2012) method of estimating NIBD as a percentage of invested capital in line with target capital structure is used.

Other Balance Sheet Items

- *Minority interest/Non-controlling interest* is forecasted as a percentage of profits after tax, coherent with what Koller et al. (2005) suggests. Historically, the ratio has fluctuated between -6,3% and 30%, going forward it is assumed that minority interest is forecasted as a constant 25% of profit after tax.
- *Total Non-Current Operating Liabilities* is forecasted as a percentage of revenue. The ratio is forecasted based on the average ratio of the corresponding historical values which have been stable at approximately 6%.

Table 14. Pro forma balance sheet assumptions

Historical Value Drivers		Forecasted Value Drivers									
Investment Drivers	*2016*	E2017	E2018	E2019	E2020	E2021	E2022	E2023	E2024	E2025	Terminal
Tangible assets / revenue	26,5%	25,0%	25,0%	25,0%	25,0%	26,5%	29,0%	29,0%	29,0%	29,0%	29,0%
Intangible assets / of revenue	14,0%	13,0%	13,0%	13,0%	13,0%	13,0%	15,0%	15,0%	16,0%	16,0%	16,0%
Other non-current assets / of revenue	1,1%	1,5%	1,5%	1,5%	1,5%	1,5%					
Deferred Tax Asset / of revenue	2,3%	2,1%	2,2%	2,2%	2,2%	2,2%					
Investment in JV & associates / of revenue	1,4%	1,4%	1,3%	1,4%	1,4%	1,3%					
Total Non-current assets % of revenue	**44,0%**	**43,0%**	**43,0%**	**43,1%**	**43,1%**	**44,5%**	**49,0%**	**49,0%**	**50,0%**	**50,0%**	**50,0%**
Working Cash / revenue	2,00%	2,0%	2,0%	2,0%	2,0%	2,0%					
Inventories / revenue	11,73%	12,0%	12,0%	12,0%	12,0%	12,0%					
Accounts Receivable / revenue	4,82%	5,0%	5,0%	5,0%	6,5%	6,5%					
Current Tax Asset % of revenue	0,16%	0,0%	0,0%	0,0%	0,0%	0,0%					
Other Current Assets % of revenue	3,19%	3,2%	3,2%	3,2%	3,2%	3,2%					
Operating current assets % of revenue	**21,91%**	**22,2%**	**22,2%**	**22,2%**	**23,7%**	**23,7%**	**24,0%**	**24,0%**	**25,0%**	**25,0%**	**25,0%**
Trade Payables % of revenue	16,89%	17,2%	17,2%	17,1%	17,1%	17,0%					
Deferred Revenue % of revenue	0,36%	0,3%	0,3%	0,3%	0,3%	0,3%					
Current Tax Liability % of revenue	0,35%	0,0%	0,0%	0,0%	0,0%	0,0%					
Other Current Liabilities % of revenue	14,48%	14,2%	14,2%	14,2%	14,2%	14,2%					
Current Provisions % of revenues	8,51%	8,5%	8,5%	8,5%	8,5%	8,0%					
Operating current liabilities % of revenue	**40,58%**	**40,2%**	**40,2%**	**40,1%**	**40,1%**	**39,5%**	**39,0%**	**38,0%**	**37,0%**	**37,0%**	**37,0%**
Net working capital % of revenue	**-18,67%**	**-18,0%**	**-18,0%**	**-17,9%**	**-16,4%**	**-15,8%**	**-15,0%**	**-15,0%**	**-13,0%**	**-13,0%**	**-13,0%**
Other Non-Current Provisions % revenue	3,22%										
Other Non-Current Liabilities % of revenue	3,87%										
Deferred Tax Liability % of revenue	0,67%										
Total Non-Current Operating Liabilities	**7,76%**	**6,0%**	**6,0%**	**6,0%**	**6,0%**	**6,0%**	**6,0%**	**6,0%**	**6,0%**	**6,0%**	**6,0%**
Net interest bearing debt % of invested capital	**-26,5%**	**50%**	**50%**	**50%**	**50%**	**50%**	**50%**	**50%**	**50%**	**50%**	**50%**
Minority Interest (non-controlling) % of net profit	20,3%	25,0%	25,0%	25,0%	25,0%	25,0%					

Source: Constructed by the authors

8.4 Terminal Value

First of all, the terminal value is estimated based on the assumption that the firm is considered a going concern at the time of the terminal value. Secondly, in the terminal period it is assumed that the cash flows of the firm grow at a constant rate forever - the steady state growth rate.

Once the steady-state is reached; the terminal value can be estimated using a perpetual growth model. According to Koller et al. (2005) and Damodaran (2012) a fundamental question in the terminal value calculation is whether growth adds value, in other words does ROIC on new investments exceed WACC. Economic theory predicts that in a competitive market, the excess returns Volvo is expected to earn over

the coming years will eventually draw in new competitors and consequently the excess return will disappear. Consequently, finance literature sometimes suggests using the convergence model[15] (setting ROIC equal to the WACC, growth does not contribute to firm value), while others uses Gordon's growth model[16] or the value driver model[17] (theoretically equivalent, both models assume growth affect value in the terminal value) (Koller et al., 2005; Damodaran, 2012; Petersen & Plenborg, 2012).

While the value driver formula relates a company's fundamental drivers of economic value; growth, ROIC, and the cost of capital, the model has its limitations. According to Koller et al. (2005), assuming a constant ROIC (on new investments) and growth rate is overly restrictive. Another concern is also when a company's competitive advantage (excess returns) is expected to fade. More specifically, linking this decline to the length of the forecasting period is hazardous since there is no direct connection between the lengths and the value of a company (Koller et al., 2005). For these reason, the authors argue, the key value driver formula is rarely used in practice. This statement is supported in a study by Petersen et al. (2006) where the authors find that practitioners significantly uses Gordon's growth model more frequently than any other terminal value model[18].

As Damodaran (2012 p. 311) points out "… *excess returns in perpetuity are not feasible, it is difficult in practice to assume that firms will suddenly lose the capacity to earn returns"*. This aspect relates to the issue of a drop in ROIC during the forecasting period. Acknowledging the competitive nature of the industry, Volvo's current and expected competitive advantage is expected to fade. Consequently, it is assumed that the company's ROIC will move towards industry average, which according to Damodaran (2012) will yield more reasonable estimates of value (this was built into the assumptions underlying the pro forma statements). This implies the following assumption: the company's competitive advantage period has not come to an end when the continuing-value period is reached and that growth affect the value of the company in the terminal period. As a result, following the pragmatic approach of the thesis, Gordon's growth model will be used to estimate terminal value.

Using Gordon's growth model requires an estimate of long-term growth in a company. From a theoretical perspective, the long-term growth rate in the industry is a function of both expected inflation and expected real growth in the industry (Petersen, Plenborg, & Schøler, 2006). To elaborate, since the stable growth rate is constant in perpetuity, it puts a strong constraint on how high it can be (Damodaran, 2012). According to Damodaran (2012), in practical terms this means that no firm can grow forever at a rate higher than the

[15] $Convergence\ model: Continuing\ Value_t = \frac{NOPLAT_{t+1}}{WACC}$

[16] $Gordon's\ growth\ model: Continuing\ Value_t = \frac{FCFF_{t+1}}{WACC-g}$

[17] $Value\ driver\ model: Continuing\ Value_t = \frac{NOPLAT_{t+1}+(1-\frac{g}{ROIC})}{WACC-g}$

[18] The result in the study show that 80% of the participants uses Gordon's growth model while 14,3% uses value driver formula and 17,1% applies the convergence model.

growth rate of the economy in which it operates and the constant growth rate cannot be greater than the overall rate of the economy. In view of Volvo's ambitions, as well as its current scale of operations, the growth rate in the global economy serve as cap. Historically, world GDP has grown an average rate close to 3% (nominal) and according to IMF (2017a) it is expected to continue grow close to this. Given that the automotive industry's matureness and close ties to world growth, the average [expected] world GDP growth rate of 3% is considered a valid proxy for the stable growth rate.

8.5 Budget Evaluation

A critical part of the forecasting process is an evaluation of the estimates and the pro forma statements and whether these are achievable, where the key ratio in the assessment is ROIC (Petersen & Plenborg, 2012). Table 15 reflects the assumptions and expectations of Volvo's competitive position and capital efficiency. Overall, the extrapolation is based on the identified strategic factors as well as the company specific financial value driver, which based on this yield the development of important individual line items (as covered in previous sections).

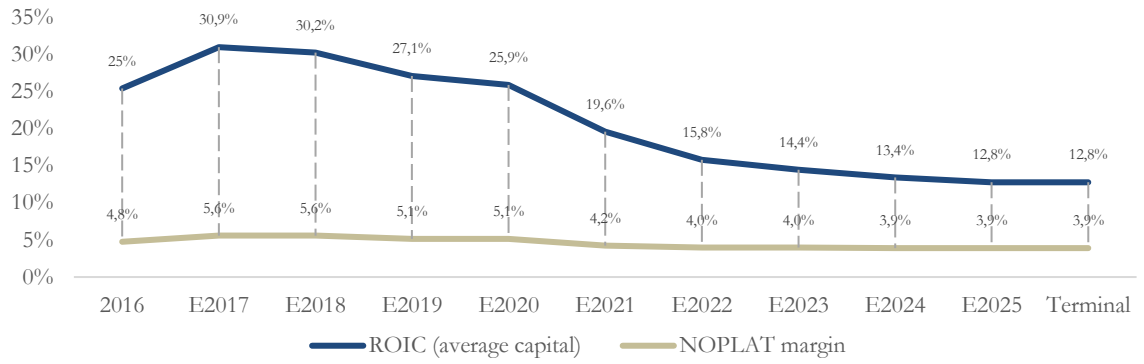
Table 15. Evaluation of the estimate supporting the pro forma statements

Historical Value Drivers	Forecasted Value Drivers											Industry Averages
	2016	**E2017**	**E2018**	**E2019**	**E2020**	**E2021**	**E2022**	**E2023**	**E2024**	**E2025**	**Terminal**	
Revenue growth	10,1%	10,9%	10,0%	9,6%	9,2%	9,1%	4,0%	3,0%	3,0%	3,0%	3,0%	
Revenue CAGR over the entire period											6%	
EBITDA margin	11,9%	12,3%	12,3%	11,7%	11,7%	10,7%	10,5%	10,5%	10,5%	10,5%	10,5%	**9,4%**
EBIT margin	6,1%	7,3%	7,3%	6,7%	6,7%	5,5%	5,2%	5,2%	5,1%	5,1%	5,1%	**5,3%**
Turnover ratio (Invested Capital)	5,3	5,3	5,1	5,0	4,7	4,3	3,6	3,6	3,2	3,2	3,2	**1,41**
ROIC after tax (average capital)	25%	30,9%	30,2%	27,1%	25,9%	19,6%	15,8%	14,4%	13,4%	12,8%	12,8%	**8,0%-10,5%**

Source: Compiled by the authors

The company is expected to maintain a relatively high ROIC, primarily driven by a further strong capital efficiency and increased profitability. Since the transition to a more profitable pricing policy not only increased profitability but also increased sales in terms of number units sold, which likely can be attributed to the successful marketing (the Volvo Way to Market) strong sales is expected to continue. The strong sales development will positively affect NOPLAT, which is estimated to increase in the explicit forecasting period. However, due to the factors identified in the strategic analysis, the company's competitive advantage is expected to fade when competitive pressure increases with a resulting decline in the invested capital turnover ratio. Figure 25 demonstrate NOPLAT and ROIC development during the forecasting period as well as its steady state.

Figure 25. Volvo's forecasted value creation



Source: Compiled by the authors

In the long run, it is expected that because of the competitive nature of the industry, ROIC will regress towards the industry (average) interval, somewhere between 8,5% and 10,5%[19]. Conclusively, taking historic ratios into account as well as estimated future ratios in conjunction with the characteristics of the industry indicates that the assumptions underlying the pro forma appear achievable.

9 Cost of capital

Petersen & Plenborg (2012) highlights the central role of cost of capital in financial analysis and valuation, as it is applied in many different contexts (more on this in later sections). The cost of capital (or "discount rate") is designed to fairly reflect the company's business and financial risk. The cost of capital is calculated as the weighted average cost of capital (WACC[20]). The WACC will be will be used for discounting free cash flow in the DCF valuation and economic profits when calculating economic value added (EVA). WACC represents the weighted average of the required return on invested capital and can be characterised as the opportunity costs investors would expect to earn in alternative investment with similar risk profile (Pearl & Rosenbaum, 2013).

Noteworthy is that, debt and equity providers do not necessarily agree on a common standard for measuring cost of capital, which creates uncertainty in the estimation process (Petersen & Plenborg, 2012). To determine the WACC, three components need to be calculated: the cost of equity, the cost of debt, and the company's target capital structure. As none of these inputs are directly observable, various models, assumptions, and approximations are necessary to estimate each component (Koller et al., 2005).

[19] Koller et al. (2005) presents average ROIC (excl. goodwill) of 10,5% for the 'Automobiles and Components' Industry between 1994 and 2003. Based on 128 firms in the" Auto & Trucks" industry Damodaran (2017) find a global ROIC of 7,45%, which when adjusted for the global tax rate this yield a ROIC of 8%.

[20] $\text{WACC} = \frac{\text{NIBD}}{\text{NIBD+Equity}} \times r_D \times (1 - \text{tax}) + \frac{\text{Equity}}{\text{NIBD+Equity}} \times r_E$

When valuing private companies, additional challenges arise when it comes to the estimation of the cost of capital compared to a public company. For example, there might be cases where information on the cost of debt (r_D) is not available, which calls for alternative estimation approaches. Further, the parameter for the cost of equity (r_E) cannot be estimated in a traditional sense since privately held companies are not traded on a stock exchange as opposed to public company. The next three subsections detail how to estimate each of the three components of WACC respectively.

Note: As of this day, Volvo has three sources of funding: common equity from the majority shareholder, preferred stock and debt. The preferred stock may be repurchased or converted into listed common stock upon the majority shareholder's request (Volvo Cars Media, 2016). Thus it will be treated as common stock.

9.1 Capital structure

According to Koller et al. (2005) the WACC should be computed using a target capital structure (weights), in line with company's long-term strategy, because current weights might not sufficiently reflect the future leverage expected to prevail over the life of the business. Since market values reflect the opportunity costs of investors and lenders, the capital structure must therefore be based on market values (Petersen & Plenborg, 2012). However, since market prices on equity for Volvo is not observable, nor does the company provide guidance on target capital structure, this requires a different estimation procedure. In the absence of the previous mentioned factors, public comparable companies or industry average is considered an appropriate approach (Koller et al., 2005). This based on the assumption that public comparable companies provide a meaningful benchmark because their management are seeking to maximise shareholder value (Pearl & Rosenbaum, 2013).

For public companies, estimating the claims of equity holders is not an issue and simply obtained by multiplying the market price by the number of shares outstanding. However, when an observable market value is not readily available, as in the case of net interest-bearing debt (henceforth referred to as debt), Koller et al. (2005) argue that in most cases book value reasonably approximates the current market value. As such, book value of debt is used as an approximation to its current market value. Moreover, Pearl & Rosenbaum (2013) contend that for private companies, the mean or median for the comparable companies is typically used.

The capital structure for Volvo's comparable companies is presented in table 16. The table shows an average debt to total capitalisation of 49,8% and a corresponding equity to total capitalisation of 50,2%, with a median of 54,9% and 45,2% to each respective metric. Additionally, the table shows an average peer leverage ratio of 1,19 and a median of 1,22. There is a relatively wide dispersion around the mean, with outliers Ford and Mazda with leverage ratio of 2,08 and 0,16 respectively. As a result, the statistical measures

are affected by these values so in order to make an appropriate estimate of the target capital structure calls for a wider industry evaluation.

Table 16. Capital structure of peer group companies

	NIBD/(E+NIBD)	E/(E+NIBD)	NIBD/E
BMW	61,3%	38,7%	1,59
Renault	57,1%	42,9%	1,33
Ford	67,5%	32,5%	2,08
GM	52,6%	47,4%	1,11
Fiat Chrysler	47,0%	53,0%	0,89
Mazda	13,5%	86,5%	0,16
Average	**49,8%**	**50,2%**	**1,19**
Median	**54,9%**	**45,1%**	**1,22**

Source: Own compilation using company filings and market data from Bloomberg

Damodaran (2017b) provide an industry average debt to total capitalisation ratio of 48,37%, yielding a leverage ratio of 0,94. This is well in line with peers' average capital structure, and indicates that book value of debt is a reliable approximation of market value. As a result, the industry average debt to total capitalisation ratio of 49,8% is considered an appropriate estimate of Volvo's capitalisation ratio.

9.2 Cost of equity

The cost of equity is an estimation of the expected return on the company's stock. This is most commonly estimated using CAPM[21], or some variation of the CAPM depending on the risk of the individual company (Koller et al., 2005). The CAPM theory is based on the principle that the expected return of any security is a function of the risk free rate, the systematic risk, measured as the covariance between the security and the movements in the overall market (β) and the market risk premium. Evidently, when valuing a private company challenges arise since the company's shares are not publicly traded and the CAPM cannot be used in a traditional sense. Despite this, Petersen at al. (2006) find that CAPM still is the most commonly used method for estimating the cost of equity for private companies. As such, in line with research approach of this thesis, the CAPM model is will be applied. Before doing so, there are three inputs that need to be estimated: the risk-free rate, the systematic risk component (beta), and the market risk premium.

Risk-Free Rate

The risk-free rate is the return that investors can expect when investing in a "riskless" security (Pearl & Rosenbaum, 2013). Both practitioners and academics have discussed the issue of whether there is an asset that is truly risk-free, reaching the conclusion that long-term U.S. or Western European government bonds are considered as good proxies for a "riskless" security since in practice these are considered default-free (Kollet et al., 2005; Petersen & Plenborg, 2012). Ideally, each cash flow should be discounted using a

[21] CAPM: $r_E = r_f + \beta \times (\text{Market Risk Premium})$

government similar maturity, however, this is disregarded by both academics and practitioners as incorporating this in the valuations is a tedious process (Petersen & Plenborg, 2012; Kollet et al., 2005). Further, since the applied valuation assume infinite cash flows, this implies using a bond with the longest possible maturity. Yet, longer-dated bonds, such as those with 30-year maturity likely suffer from decayed prices and yield premiums due to their illiquidity. In addition, theory suggest zero-coupon bonds as the most valid proxy to eliminate reinvestment risk (Koller et al., 2005).

For valuation purposes, finance literature therefore suggests using a 10-year zero-coupon government bond. As such, this thesis will use the 10-year German government bond as a proxy for the risk-free rate. This will treat issues such as inflation consistently since cash flows and risk free rate will be on a nominal basis and measured in the same currency. The current yield for a 10-year German government bond is quoted at 0,454% (see appendix 14)

Systematic Risk

Beta is a function of the return on an individual stock and the market portfolio and is a measure of the systematic risk. As stated previously, the shares of privately held companies are not traded on a stock exchange, which leads to the inability of estimating company specific beta. Thus, alternate approaches have to be adapted. Petersen and Plenborg (2012) suggest estimating beta using publicly traded comparable companies and Koller, Goedhart, and Wessels (2005) suggest using industry beta as the superior alternative, both approaches will be adapted to increase the accuracy of the beta estimate.

Estimating Beta: Comparable company approach

Damodaran (2009) state the three major components for estimating beta:

i. The market index ii. The time period iii. The return interval

As Damodaran (2009) points out, though there are no indices that truly represent the market portfolio, market weighted indices containing as many securities as possible is an accepted substitute. Further, the market index should reflect the extent to which the marginal investor is diversified to better represent the systematic risk that the investor is exposed to. Considering the fact that Volvo operates globally, the MSCI World Index is arguable the most appropriate index[22]. The choice of index is supported by the suggestions of Koller et. al. (2005). Further, the time period is to be chosen in a way that yields the beta that best represents the future. That means, a longer observation period does not necessarily yield a "better" estimate of future beta (Damodaran, 2009). However, the beta has been derived through regression analysis on both a five and ten-year interval to also cover the global financial crisis.

[22] The MSCI World Index is a broad global equity benchmark that represents large and mid-cap equity performance across 23 developed markets countries (Source: www.msci.com/world)

Damodaran (2009) and Koller et al. (2005) suggest that the return interval should be sufficiently long to not be affected by non-trading days which could affect the beta estimate and suggest monthly data points as the most appropriable interval. Koller et al (2005) state the number observations should exceed 60, which is in line with common statistic methodology, and that monthly returns are the most appropriable to avoid systematic bias. This is ensured when performing both a five and ten-year regression analysis on monthly data points.

The estimated beta coefficients are seen in table 17 and regression output in appendix 15 and show that the estimated company specific betas are much higher on average when using a ten-year period than a five. Further, to limit the probability of operational changes the five-year period is considered the most appropriate, which is supported by Koller et al (2006) who suggest the interval as common practice.

The average levered beta during the five-year period is 1,67 providing with a 95% confidence that the true beta lay between 0,99 to 2,34. In order to derive Volvo's beta from the peer group one must first unlever the betas seen in table 17. This is done by dividing the levered beta with one plus the debt to equity ratio[23]. The key assumptions underlying this equation is that the beta on debt is zero, the capital structure constant and future tax shields unknown (Koller et. al., 2005). The average unlevered beta is 0,97, with Mazda driving up the average with an unlevered beta of 1,9.

Table 17. Comparable companies unlevered beta

(€ millions) Company	Levered Beta	Book Value of NIBD	Market Value of Equity	Debt/ Equity	Unlevered Beta
BMW	1,12	86.121	54.270	1,59	0,43
Renault	2,48	31.543	23.736	1,33	1,07
Ford	2,08	88.221	42.406	2,08	0,68
GM	1,45	62.605	56.506	1,11	0,69
Fiat Chrysler	2,19	17.197	19.388	0,89	1,16
Mazda	2,08	1.214	7.777	0,16	1,80
Average	**1,90**	**47.817**	**34.014**	**1,19**	**0,97**

Source: Own construction

Estimating Beta: Industry approach

Another way to estimate beta is using industry average, which is suggested by Koller et al (2006) as a way to improve the estimate of future beta. Given the rather large group of comparable companies used to derive peer group beta this measure should lay in the proximity of the previously derived beta. In the long run company beta should approach the industry average. Damodaran (2017b) provide an estimate of the

[23] $\beta_{Unlevered} = \frac{\beta_{Levered}}{(1+\frac{D}{E})}$

unlevered industry beta using 128 companies of 0,7. This is considerably lower and provides an unlevered beta range of 0,7-0,97.

Based on the above discussion, Volvo's unlevered beta is estimated 0,83, which is the average of the peer group and industry beta. By re-levering the beta using Volvo's target debt to equity ratio of 0,94, the levered beta is estimated to 1,66.

Market Risk Premium

The market risk premium reflects the excess return of the market portfolio relative to the risk-free rate. Petersen and Plenborg (2012) state three main methods to estimate the premium, construct a sample of investor estimates and take the average, calculate the premium based on historical data or calculate the implicit premium based on current share price. The first approach will be used in this thesis because it allows the potential for leveraging several estimations performed by professionals. Petersen and Plenborg (2012) report a risk premium between 5,3-7,9 % depending on the geographical region where the lower bound represents mature markets and the upper represent "other" which is based on the risk premium used by 224 industry professionals. Damodaran (2017b) provides a global weighted average risk premium of 7,06%. In line with the reasoning throughout this thesis, the global average of 7,06% is considered the most suitable market risk premium.

Adjustments to cost of equity

As highlighted by Petersen et al. (2006), scholars often times suggest adding a premium for lack of marketability (illiquidity) due to the difficulties of turning privately held ownership shares into cash. This does not only comply to private firms but also publicly traded ones with low trading volumes (Mellen and Evans, 2010). The determination of whether a marketability premium is appropriate or not is determined by the identity of the investor. In case of a private buyer, both financial and strategic, this would be appropriate as the owners would not be able to easily convert ownership to cash. On the other hand, in case of a publicly traded buyer or an IPO, a marketability premium is not deemed appropriate. This is based on that even though Volvo is the smallest company in the peer group, analysts deem it likely that the company would make the third largest IPO on the Nordic stock markets after Telia and Dong, and thus, trading volumes are expected to be high (Hägerstrand, 2017).

Thus with no adjustments, using the CAPM and estimated risk free rate of 0,454%, equity beta of 1,66 and a market risk premium of 7,06%, yields a cost of equity of 12,2%.

9.3 Cost of debt

The cost of debt consists of three components: the risk-free rate, the credit spread that debtholders require on top of the risk-free rate for operational and financial risk and the corporate tax[24]. As derived in the previous section, the risk-free rate is set to 0,454% and the global average corporate tax rate is 23,62%.

Volvo has issued three bonds during 2016 and received a BB positive credit rating from S&P and a corresponding Ba2 stable from Moody's which is considered a speculative grade (Volvo, 2017b). In this case, Koller et al. (2005) propose either calculating either using the CAPM model adding a premium of 0,5 percent or the debt rating to estimate the credit spread. The longest-term traded debt matures in 2022 and is thus judged as to short-term to match the duration Volvo's future cash-flow. Thus, the second approach, to use the credit rating, is deemed to provide the most viable estimate of Volvo's cost of debt. Damodaran (2017d) suggest a 3% spread for a BB and Ba2 rated non-financial firm with a market cap exceeding $5 billion. Petersen and Plenborg (2012) suggest a credit spread ranging between 2,6 percent and 11,2 percent. Given the positive outlook from S&P, a credit spread in the lower range is deemed acceptable.

In sum, with a risk-free rate of 0,454%, a 3% credit spread and a 23,62% corporate tax, Volvo's after-tax cost of debt is estimated to 2,64% percent.

9.4 WACC

The WACC is calculated using the target capital structure (debt to total capitalisation ratio of 49,8%), the cost of equity (12,2%,) and finally the cost of debt after-tax cost of debt (2,64%). Based on the estimated components and parameters, the WACC is estimated to 7,44%.

10 Estimating Enterprise Value

The value derived in this chapter represent both the intrinsic value as well as the market value. It is not uncommon that the methods assign different value to the business, and as such, this yields a valuation range. This range represents the fair market value of the company and thus the company's IPO value range.

10.1 Discounted Cash Flow Analysis

DCF is as present value approach and an absolute valuation model, where the value of the company is based on the present value of expected future FCFF (Petersen & Plenborg, 2012). A company's projected FCFF is derived from a variety of assumptions and judgments about its expected future financial performance (as covered in previous sections). The method uses on the concept of time value of money, with the underlying principle of the model is that investors should focus exclusively on future net cash flows because that is the only financial benefit to investors (Evans & Mellen, 2010). The DCF analysis estimate

[24] $\text{Cost of debt} = (r_f + r_{spread}) \times (1 - \text{tax})$

the intrinsic enterprise value of Volvo based on the projections of the cash flows discounted with the cost of capital[25]. Because the present value approach applied yields the enterprise value as opposed to market value of equity, it is necessary to deduct the value of net interest-bearing debt and minority interests from the enterprise value to obtain an estimated market value of equity. The value derived reflects the company's size, quality of management, depth and breadth of products, market share and customer base, financial position, and overall profitability and cash flows as a stand-alone on-going business. In other words, the value estimated represent the company's stand-alone fair value and the minimum acceptance price (in a negotiation) as the owner currently enjoys the benefits this value provides. Table 18 show the discounted cash flows with the resulting enterprise value and equity value.

Table 18. Volvo: discounted cash flow analysis

€ million	*2016*	E2017	E2018	E2019	E2020	E2021	E2022	E2023	E2024	E2025	Teminal Value
NOPLAT	893	1.162	1.278	1.285	1.403	1.258	1.238	1.275	1.283	1.322	1.361
Depreciation & Amortization	1.093	1.028	1.131	1.239	1.352	1.533	1.639	1.689	1.779	1.832	1.887
Changes in Net Working Capital	1.056	243	374	370	0	227	(60)	140	(515)	128	132
Net CAPEX	(2.226)	(1.669)	(2.059)	(2.092)	(2.220)	(2.888)	(3.287)	(2.089)	(2.521)	(2.267)	(2.335)
Free Cash Flow to the Firm	**816**	**764**	**723**	**803**	**536**	**130**	**(470)**	**1.014**	**26**	**1.015**	**1.046**
Present Value Free Cash Flow to the Firm		*711*	*626*	*647*	*402*	*91*	*-305*	*614*	*15*	*532*	**12.362**

Enterprise Value	**15.695**
- NIBD (2016)	(941,7)
- Minority Interest	391,9
Intrinsic Value of Equity	**16.245**

Terminal Value as % of Enterprise Value 78,8%

Source: Constructed by authors

Over the next five years, the company is expected to have relatively strong free cash flows, driven by continued strong revenue growth and ROIC as the company continue to capitalise on heavy investments made in previous years. After this period, though the company is expected to be able to generate positive cash flows, CAPEX requirements is expected to suppress cash flows. As seen in the table, Volvo's EV is estimated to €15.695 million and subtracting NIBD and minority interest, yields an estimated market value of equity of €16.245 million. It is worth mentioning, considering it might seem peculiar at first sight, that the expected market value of equity exceeds the estimated EV, this is explained by the substantial financial assets the company currently possess. As investors pay one-for-one for cash, the net balance between interest bearing debt and cash increases the equity value. Finally, in this analysis the terminal value's proportion of EV is equal to 78,8%.

[25] $\text{Enterprise Value}_0 = \sum_{t=1}^{n} \frac{FCFF_t}{(1+WACC)^t} + \frac{FCFF_{t+1}}{WACC-g} \times \frac{1}{(1+WACC)^n}$

10.2 Economic Value Added (EVA)

Economic value added, when applied correctly, yields the identical result as the DCF analysis. One shortfall of the DCF analysis is that it provides little insight into the company's performance; declining free cash flows can signal either poor performance or investment for the future (Koller et al., 2005). Though the result is identical, it can be interpreted in a different and complementary way. The advantage of the model is its close ties to economic theory and competitive theory as it highlights whether a company is earnings its cost of capital in a given year (or excess of it) (Koller et al., 2005). As such, the model demonstrates economic profit as a useful measure for understanding the company's performance in any single year, whereas free cash flow does not allow such interpretation because free cash flow in any year is determined by discretionary investments in fixed assets and working capital. In the EVA approach, the company's value equals the amount of capital invested plus a premium equal to the to the present value of the economic profit created by the company in a single period[26] (Petersen & Plenborg, 2012). Table 19 present the economic profit calculations and estimation of enterprise value using the EVA model[27].

Table 19. Volvo: Economic value added analysis

€ million	E2017	E2018	E2019	E2020	E2021	E2022	E2023	E2024	E2025	Teminal Value
Beginning Invested Capital	3.556	3.954	4.509	4.991	5.859	6.986	8.694	8.955	10.212	10.518
ROIC (Beginning Capital)	32,7%	32,3%	28,5%	28,1%	21,5%	17,7%	14,7%	14,3%	12,9%	12,9%
WACC	7,44%	7,44%	7,44%	7,44%	7,44%	7,44%	7,44%	7,44%	7,44%	7,44%
Economic Profit	897	984	950	1.032	822	718	629	617	562	579
Present Value Economic Profit	*835*	*852*	*766*	*775*	*574*	*467*	*380*	*348*	*295*	*6.846*

Enterprise Value	**15.695**
- NIBD (2016)	(941,7)
- Minority Interest	391,9
Intrinsic Value of Equity	**16.245**

Future Economic Profit as % of Enterprise Value	43,6%

Source: Created by the authors

The table shows an estimated EV of €15,695 million and an estimated market value of equity of €16,245 million, which equal the estimated values in the DCF. According to Damodaran (2012), companies that earns a high ROIC and excess return in the current period are likely to sustain these excess returns for the next few years - a momentum that is well in line with future estimates. In summary, the company is assumed to have positive outlooks (positive economic profits) due to its strategic position and competitive advantage, though at a decreasing pace as in a competitive market, excess returns will eventually draw in new competitors and it will fade.

[26] Economic Profit = Invested Capital x (ROIC – WACC) ≡ Economic Profit = NOPLAT – (Invested Capital x WACC)

[27] $\text{Enterprise Value} = \text{Invested captal}_{t=0} + \sum_{t=1}^{n} \frac{EVA_t}{(1+WACC)^t} + \frac{EVA_{n+1}}{WACC-g} \times \frac{1}{(1+WACC)^n}$

In this calculation, the terminal value makes up 43,6% of the estimated EV, which is far less than the terminal value in the DCF model. The difference is explained by the fact that the EVA model uses invested capital as a starting point, which only increases if excess returns are realised. Therefore, implied in the forecasts that the company's future performance is expected to generate positive economic profits, in other words, above the required return.

10.3 Market Valuation: Comparable Companies Analysis

Comparable companies analysis is a market valuation method based on multiples, which relies on the relative pricing of peers' earnings. The quality of the analysis rests upon the premise that similar companies provide a highly relevant reference point for valuing a case (target) company due to the fact that the companies share key business and financial characteristics, performance drivers, and risks (Pearl & Rosenbaum, 2013). Moreover, the valuation multiples can be deduced from the discounted cash flows approach, implying that multiples ideally yield value estimates that are equivalent with the DCF. As such, comparable companies analysis can support and evaluate the accuracy of the intrinsic valuation in terms of the plausibility of cash flow forecasts, explain mismatches between a company's performance and that of its competitors, and a strategic discussion of the company's positioning for value creation (Koller et al., 2005). The relative valuation is designed to reflect "current" valuation based on prevailing market conditions and sentiment, at a given point in time (Pearl & Rosenbaum, 2013).

Following the recommendations of Pearl and Rosenbaum (2013) and Petersen and Plenborg (2012), the multiples valuation will be based on enterprise value to EBIT (EV/EBIT), enterprise value to EBITDA (EV/EBITDA), and enterprise value to sales (EV/Sales) multiples for the comparable companies. Pearl and Rosenbaum (2013) argue that EV/EBITDA is the superior ratio to use since it is independent of capital structure and differing taxes, as well as differences in D&A. However, in this case, R&D expense are treated differently depending on accounting standard, which make the EBITDA multiple less attractive as the companies not following IFRS will have a deflated EBITDA. This would support the use of EBIT over EBITDA as it likely decreases the discrepancy inherent with the issue due to it including the effect of amortisation whilst still excluding the effect of capital structure.

Based on this, both EV/EBITDA and EV/EBIT will be used in the valuation. Further, even though sales are no guarantee of neither profitability nor cash flow generation, Pearl & Rosenbaum (2013) argue it provides a "sanity-check" of the derived EV, especially relevant in cases where historical earnings have been volatile (as in the case of Volvo). Finally, research has shown that forward-looking multiples to be more accurate predictors of EV, as they are more consistent with the principles of valuation by being based on future cash flow (Koller et al., 2005). In this case, forward-looking multiples translates to earnings estimates in 2017 and 2018.

Table 20 show the 2017 and 2018 multiples based on consensus estimates of sales, EBIT and EBITDA. Prior to estimating a value range, Pearl and Rosenbaum (2013) suggest an additional screening of the peer group based on trading multiples in order to exclude additional outliers. As seen in the table, Ford is traded on multiples significantly higher than the other peer group companies and is thus excluded. Once Ford is removed, average one year forward-looking EV/EBIT and EV/EBITDA multiples of 13,0x and 7,6x is obtained.

Table 20. Comparable companies analysis

	Enterprise Value /					
Company	2017E Sales	2018E Sales	2017E EBITDA	2018E EBITDA	2017E EBIT	2018E EBIT
Europe						
Bayerische Motoren Werke AG	1,6x	1,5x	10,6x	10,3x	15,7x	15,4x
Renault SA	1,1x	1,0x	9,4x	9,3x	18,4x	17,5x
North-America						
Ford Motor Company	1,4x	1,3x	15,7x	14,9x	31,2x	29,4x
General Motors Co	1,0x	1,0x	9,6x	9,5x	15,9x	16,2x
Fiat Chrysler	0,3x	0,3x	2,9x	2,7x	6,0x	5,5x
Asia-Pacific						
Mazda Motor Corporation	0,4x	0,4x	5,7x	4,6x	9,2x	6,8x
Overall						
Mean	**1,0x**	**0,9x**	**9,0x**	**8,6x**	**16,1x**	**15,1x**
Median	**1,0x**	**1,0x**	**9,5x**	**9,4x**	**15,8x**	**15,8x**
High	**1,6x**	**1,5x**	**15,7x**	**14,9x**	**31,2x**	**29,4x**
Low	**0,3x**	**0,3x**	**2,9x**	**2,7x**	**6,0x**	**5,5x**

Source: Own construction

Table 21 show the estimated value range for Volvo. The shaded areas represent the estimated fair value of Volvo using next year's consensus EV/EBIT and EV/EBITDA multiples for peers. An EV of €19.814 million is obtained through the EV/EBIT valuation and slightly lower EV of €19.451 million is obtained by the EV/EBTIDA multiple. The table also show the implied trading multiples for the next two years' financial performance. The "sanity check" multiple (EV/sales), indicates that the estimated EV is in line with the peers' average respective EV/sales multiple.

The derived value of Volvo, using the market approach is significantly higher than the value derived from the DCF analysis. However, the market approach is designed to reflect *current* valuation (assuming an efficient market) based on prevailing market conditions and sentiment. As such, market trading levels may be subject to period of irrational investor sentiment that skew valuation either too high or too low (Pearl & Rosenbaum, 2013).

Table 21. Multiples valuation of Volvo and implied multiples

	Metric	(Average) Multiple	Implied Enterprise Value	Implied Sales multiple	Implied EBIT multiple	Implied EBITDA multiple
	EBIT					
2017E	1.521	13,0x	**19.814**	1,0x		7,8x
2018E	1.673	12,3x		0,9x	11,8x	7,1x
	EBITDA					
2017E	2.549	7,6x	**19.451**	0,9x	12,8x	
2018E	2.804	7,3x		0,8x	11,6x	6,9x
Equity Value Range	**20.001 - 20.364**					

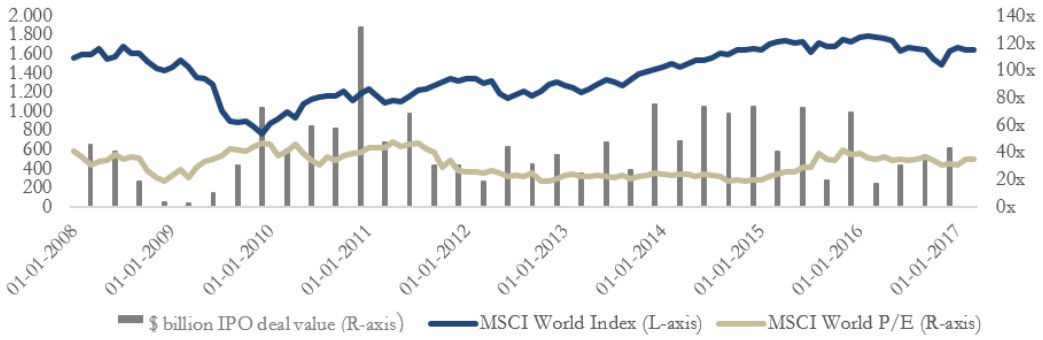
Source: Own construction

Noteworthy is that at the time when this thesis is written, stock markets are trading at historically high levels. This aspect likely explains the high trading multiples and the variation of Volvo's derived value using the different valuation methods.

10.4 Existing Market Conditions: Stock Market

Many major price equity indices are currently at all-time high levels (see appendix 16)[28]. Figure 26 show the historical chart of the MSCI World Price Index, the Price to Earnings (P/E) ratio, and global IPO deal value activity (R-axis).

Figure 26. MSCI World historical price and P/E chart



Source: Datastream and EY (2016). Compiled by the authors

Since the financial crisis in 2008, global equity prices have more than doubled. The price that investors is willing to pay for 1$ of corporate earnings is at a slightly higher level (35,1x) compared to its nine-year average (31,0x). The global economy is expanding positively and company earnings is rising. The P/E ratio has climbed to 35,1, at the same time as prices have increased considerably.

[28] Important to note is that analysing future outlooks for the stock market is outside of scope for this thesis. This paragraph is included to give substance to the discussion related to a possible exit option.

As seen in figure 26, global IPO deal value has increased in four consecutive quarters, leading into 2017. This positive trend implies that the has an appetite for new listings. Going forward, EY (2016) forecasts that this trend continues and project even stronger activity in 2017.

11 Sensitivity Analysis

Since valuation involves subjective assumptions and estimates of parameters as well as key performance drivers, it inevitably inherits uncertainty. This as inputs estimates in reality can undertake other values than the assumed (most likely) value. Therefore, a recommended final step of the valuation is evaluating the sensitivity of the projected financials and how robust the model's result is to alternative assumptions (Koller et al., 2005; Petersen & Plenborg, 2012). As a result, the DCF output is a set of value ranges, rather than a single value. The derivation of a valuation ranges by varying a few key inputs is called sensitivity analysis. The sensitivity analysis performed in thesis is designed to assess the effects of discrete risk (what-if analysis) and continuous risk (simulation).

11.1 What-if Analysis

A what-if analysis is an approach that examines the valuation consequences under discrete scenarios (changes in key value drivers). This risk analysis is performed on key inputs in the DCF, namely, WACC and the steady-state growth rate. The results of the different scenarios analysis are shown in table 22. The table illustrates how adjustments of key inputs, both individually and simultaneously, in the DCF affects the enterprise value. From table 22, it is clear that deviations from the estimated value affects the enterprise value of Volvo.

Table 22. Sensitivity analysis

Enterprise Value (€ millions)								
		WACC						
		5,94%	6,44%	6,94%	7,44%	7,94%	8,44%	8,94%
Growth Rate	1,5%	17.558 *(12%)*	15.546 *(-1%)*	13.916 *(-11%)*	12.571 *(-20%)*	11.443 *(-27%)*	10.486 *(-33%)*	9.665 *(-38%)*
	2,0%	19.340 *(23%)*	16.908 *(8%)*	14.982 *(-5%)*	13.421 *(-14%)*	12.132 *(-23%)*	11.051 *(-30%)*	10.134 *(-35%)*
	2,5%	21.641 *(38%)*	18.617 *(19%)*	16.288 *(4%)*	14.442 *(-8%)*	12.947 *(-18%)*	11.712 *(-25%)*	10.676 *(-32%)*
	3,0%	24.725 *(58%)*	20.822 *(33%)*	17.925 *(14%)*	**15.695**	13.927 *(-11%)*	12.493 *(-20%)*	11.310 *(-28%)*
	3,5%	29.076 *(85%)*	23.778 *(52%)*	20.040 *(28%)*	17.265 *(10%)*	15.128 *(-4%)*	13.433 *(-14%)*	12.060 *(-23%)*
	4,0%	35.673 *(127%)*	27.948 *(78%)*	22.874 *(46%)*	19.292 *(23%)*	16.634 *(6%)*	14.585 *(-7%)*	12.962 *(-17%)*
	4,5%	46.865 *(199%)*	34.272 *(118%)*	26.872 *(71%)*	22.010 *(40%)*	18.578 *(18%)*	16.030 *(2%)*	14.067 *(-10%)*

Source: Own construction

The centre shaded area represents the estimated DCF value of Volvo, whereas the outer shaded areas illustrate the range of values derived from the relative valuation. Next to each respective EV the percentage change from the DCF value is presented. As illustrated in the table, the EV is highly sensitive to changes in both WACC and the stable growth rate. For example, a decrease of 0,5% in WACC and 0,5% increase in the stable growth increases the EV by 28% to €20.040 million. However, based on this representation, the

assumptions and estimates made in the DCF valuation seems somewhat in line with the market valuation. As Pearl and Rosenbaum (2013) points out, even though there might be a difference in the valuation implied by the DCF versus the market valuation method (or any other method for that matter), this does not necessarily mean that the analysis is flawed but rather due to company specific aspects.

11.2 Monte Carlo Simulation

As a way of enhancing the sensitivity analysis, by moving beyond the effects of discrete risk, simulations provide a way of examining the consequence of continuous risk. The simulations will be performed using the Monte Carlo method, as first introduced in finance by David B. Hertz (1964). In general terms, the Monte Carlo method is a computational algorithm that relies on repeated random sampling to obtain a numerical result or to generate draws from a probability distribution. Contrary to a deterministic model (like the DCF analysis), which derives the value based on the most likely estimates, the input variables are entered into the model as a respective statistical probability distribution. Consequently, one of the methods advantage over other models, while it does not provide a single numerical solution to a problem, it does result in a statistical probability distribution of all potential outcomes (Vose, 2000). Put differently, the practical application of allowing key value drivers in the DCF to change simultaneously, as opposed to being fixed, the simulation extends the DCF analysis to handle the input of distribution parameters instead of solely "best-guess" estimates. The first steps of designing the simulating model are determining the *probabilistic variables* and defining the *probability distributions* for these variables.

Unlike the what-if analysis, where the number of variables that are changed have to be few and assigned equal probability, there is no constraint in how many variables that can be included in the simulation. However, as Damodaran (2007) points out, defining probability distributions for each and every input is time consuming and may not provide much value, especially if the inputs only have a marginal impact on value. Additionally, including more inputs might cause issues due to correlation between variables, where the option then becomes either to drop input variables that correlate or build the correlation explicitly (Damodaran A. , 2007). Since this thesis is limited to three years of financial data, historical data and cross sectional data yields insufficient and unreliable distribution guidance (which affect the estimation of correlation). Consequently, this thesis will focus on a few variables that have a significant impact on value; revenue growth, EBITDA margin, intangible and tangible assets as a percentage of revenue (CAPEX) and WACC.

The second step is defining the probability distribution for these variables, which is a demanding and problematic process. According to Damodaran (2007), there are three ways of to go about it: historical data, cross sectional data, and statistical distribution and parameters. Given the issue of insufficient data, as mentioned above, this is become a problematic task. In such instance, the remaining option is picking a statistical distribution that best captures the variability in the input and estimate the parameters for that

distribution. Probability distribution can take two forms, discrete or continuous with the difference of the number of possible values that the variable can take on. Within the DCF framework and the incorporation of Monte Carlo simulation, research and business analysts often mention the uniform or triangular probability distribution (for example, see Titman & Martin, 2011; Togo, 2004; French & Gabrielli, 2004). The two just mentioned distributions are represented in the discrete category, where only a limited set of outcomes is possible (for details on probability distributions see appendix 17).

This thesis will apply the triangular distribution due to its intuitiveness, usefulness and flexibility. There are three parameters that specify a triangular distribution: the minimum possible value, the maximum possible value and the most likely value. The value assigned to each respective input is based on business sense. In addition, unlike the uniform distribution, it does not assign equal likelihoods for all values within the given range nor does it impose symmetrical probabilities around the most likely value (the possibility to skew the distribution). For practical purposes, is therefore assumed that the triangular distribution is a "good-enough" approximation to whatever the real distribution might be, since the most likely value would have been used even in the case of not applying Monte Carlo simulation (French & Gabrielli, 2004).

The assigned probabilistic distribution to each input variable is shown in table 23. As seen in the table, all input variables except for the high growth revenue period is assumed to have a symmetrical shape (skew equal to 0,5, meaning equal possibility on each side of the most likely value). All input values are allowed to vary around the most-likely outcome by plus/minus 2% in absolute terms, with the exception of revenues in the high growth period. This is skewed towards the downside, by allowing values 6% lower and 2% higher than the most likely value. This is done because the high growth estimates represent a scenario where Volvo to a continues to be successful. Before proceeding, the authors acknowledge that this rather simplistic approach to determine how a random variable is distributed according to the probability of it taking a value has its limitations and drawbacks. Yet, exploring and determining the "real" distribution of the variables is a cumbersome task and outside of scope for this thesis. As such, it is important to note Monte Carlo is merely used to challenge the most likely estimates with respect to continuous risk.

Table 23. Triangular distribution assumptions

Intangible's & Tangibles % of Revenue		Revenue High Growth		Revenue Stable Growth		EBITDA		WACC	
Skew	0,500	Skew	0,750	Skew	0,500	Skew	0,500	Skew	0,500
Min.	43%	Min.	104%	Min.	101%	Min.	9%	Min.	5%
Most-likely	47%	Most-likely	110%	Most-likely	103%	Most-likely	11%	Most-likely	7%
Max.	50%	Max.	112%	Max.	105%	Max.	13%	Max.	9%

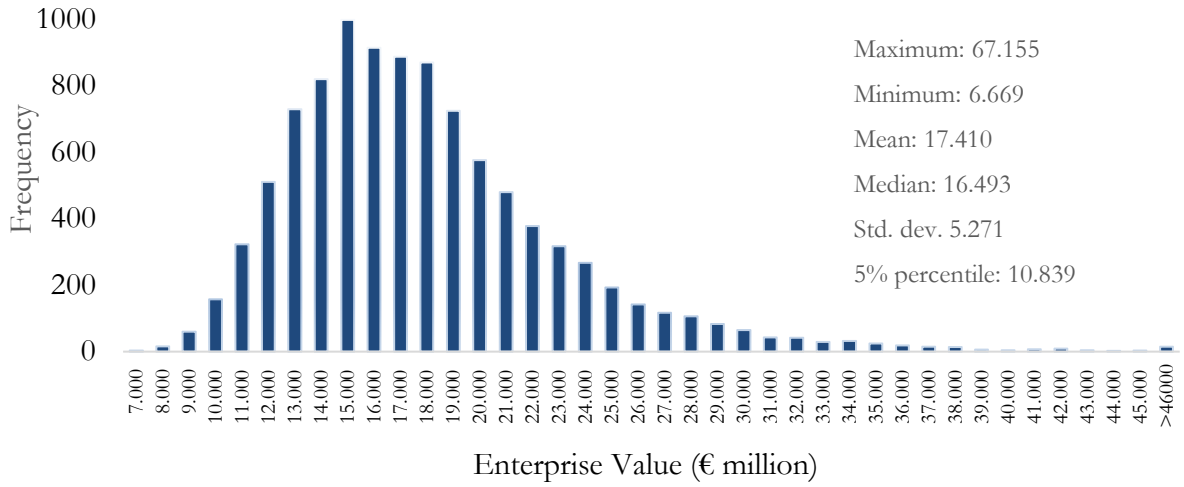
Source: Own construction

For each simulation, a random outcome is drawn from each predefined distribution to generate unique set of cash flows which is used to calculate the enterprise value (identical DCF analysis except variables are

randomly picked from its respective distribution). Figure 27 illustrate the graphical representation of 10.000 unique iterations (number of simulations) with respective descriptive statistics.

The output from the Monte Carlo show that the minimum and maximum value is 6.669 and 67.155 respectively, and have a standard deviation of 5.271. Values are centred between 15.000 and 17.000. Looking at 5th percentile from output reveals a value of 10.389, which according to the simulated model means that there is 95% chance of realising a EV larger than this value. The intrinsic EV of Volvo is in the 42nd percentile, meaning that it is 58% likely to get a higher value. From the results, it can be concluded that there is larger "up-side" than "down-side" of the valuation, meaning it is more likely to estimate a value larger than the fair stand-alone value derived in the deterministic DCF analysis.

Figure 27. Monte Carlo simulation



Source: Own creation

12 Concluding Value I

Based on the strategic and financial value drivers identified in Part III, this part began with the construction of pro forma statements that were best believed to reflect the expected performance of Volvo. Due to the company's competitive advantage it is expected to grow considerably and realise excess returns for next five years. However, as both macroeconomic and competitive forces are expected to put pressure on the overall industry, the period of high returns is expected to fade as the intensity of rivalry increases. The following section estimated the cost of capital, which reflects the risk associated with the company's cash flows. Based on benchmarking peers in various exercises, for example target capital structure and systematic risk, as well as estimating the company's cost of debt, a WACC of 7,44% was estimated. The two sections were then used in conjunction to derive the estimated fair value of Volvo using two different present value approaches. The DCF and EVA analysis indicates an equity value of €16.245 million. Additionally, by using current trading multiples of peers, a market valuation-range of €20.001 – €20.364

million was derived. This implies an IPO value range between €16.245 – €20.364 million. Due to the uncertainty involved in extrapolating the company's future performance and activity, a sensitivity analysis was performed on key inputs in the DCF. This analysis showed a greater chance of realising a higher value than the value derived in the DCF analysis. Conclusively, with regards to stock markets, IPO activity and current market valuation, the present market conditions appears attractive and yield a positive outlook for an IPO exit.

PART V: ALTERNATIVE EXIT STRATEGIES & VALUATION

This part will determine if there is an alternative exit strategy that generates more value than the estimated IPO-value. Firstly, the rationale behind different exit strategies and a description of current market conditions is outlined to source for a potential buyer. Secondly, based on whether an investment case is found, the investment value is derived.

13 Alternative Exit Strategies

For private company owners, there are almost as many exit options (strategies) as there are seller motives. Broadly categorised, the objectives can be both financial and non-financial. To mention a few, seller motives include personal desire to leave (retirement for example), competitive pressure, financial difficulties, or desire for liquidation on the part of the primary shareholder (Evans & Mellen, 2010; PwC, 2013). Table 24 show example of option for ownership transfer.

Table 24. Examples of exit options

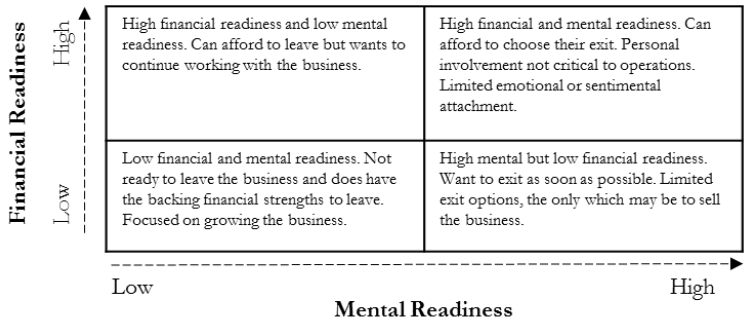
▪ Debt refinancing	▪ Sales to employees (ESOP)
▪ Divestures	▪ Sales to management (MBO)
▪ Initial Public Offering (IPO)	▪ Sales to a third party
▪ Joint Ventures	▪ Spin-offs
▪ (Leveraged) Recapitalisation	▪ Strategic alliances

Source: Evans & Mellen (2010)

The best choice of exit mode for a private company owner is dependent on many factors; whether owners want an ongoing management involvement in the business, existing market conditions and state of the industry, and synergy opportunities with potentially interested parties (Deloitte, 2014b). Underlying the decision is the question of timing; when is the preferred time to pursue a transaction? This consideration has been evident in the case of Volvo. The company's owners explicitly raised concerns of how the market was currently valuing the company in 2015, with the conclusion that exiting at that particular time was not an option.

This chapter will focus on the sales to a third option (in other words, whether such a transaction is an attractive and possible option) because this option is generally the most effective means to immediately realise shareholder wealth (Evans & Mellen, 2010). Important to note in this context is that identifying the "*best*" buyer is also dependent on the goals of the company's owner. Whether Li Shufu is interested in retaining a financial stake after the sale (to realise some upside potential) or completely wants to cash out is obviously unknown.

Figure 28. Exit quadrant chart



Source: Own creation. Adapted from Evans & Mellen (2010)

Evans and Mellen (2010) presents a simplistic model for characterising and assessing the type of exiting owner. Taking into account the development of Volvo since the acquisition from Ford in 2010, and with regards to previous strategic and financial analysis, it is assumed that Li Shufu position is in the upper right corner of figure 28. Given the assumptions on Li Shufu's mental and financial readiness, the sale of the business to a third party is, according to Evans and Mellen (2010), typically what happens. That is, owners are either rich and ready to leave or looking to get out at the highest price. As a result, an analysis on this type of transaction becomes relevant, with the effect that if a transaction would take places this would result in a complete transfer of ownership.

In sales to a third party, there are three broad categories of buyers: strategic (horizontal competitors for example), vertical integrators (either up or down the supply chain) or financial buyers (Private Equity (PE) firms for example). Any type of potential buyer for a business will consider the quantitative and qualitative features of the company, such as a competitive advantage in the marketplace, customer base, and business strategy (PwC, 2013). However, different buyers will weigh the value of these features differently. Therefore, this section will focus on the business from the perspectives of different potential buyers and how these assess the business as a potential acquisition. It will go through the objectives and goal of each type of buyer to understand what drivers the strategy behind the process. The sole purpose of this section is identifying what buyer presents the best match for Volvo's owner and who will more likely place a higher value on the business. Finally, contingent on whether Volvo is considered an attractive investment, for any of the buyers, a deal value will be estimated.

13.1 Potential Buyer: Financial Investor

In general, financial buyers (also known as financial sponsors) are referred to as private equity (PE) firm, venture capital firms, and other investment funds or vehicles (Pearl & Rosenbaum, 2013). This group of investors can be classified as investors interested in the return they can realize through buying a business. By nature, the pursuit of return opportunities translates into investing in undervalued companies, provides financial supports, and exits the investment for a profit in within the next 10 years (PwC, 2013; Barber &

Goold, 2007). In this thesis, if a financial buyer is identified, the transaction will be measured in the form of an LBO valuation. This will be applied as it is an approach that is used by financial sponsors (primarily PE firms) to acquire a range of businesses, including both public and private companies[29] (Pearl & Rosenbaum, 2013). The foundation for an LBO candidate provides a solid foundation of the investment rationale and investment decision for financial buyers. Consequently, it is therefore assumed that the theoretical attractiveness of an LBO candidate is applicable to all potential financial buyers.

Theoretical Investment Rationale

In short, the key feature of a LBO is the use of debt to finance (leverage) a large portion of the purchase price, where the financial sponsor funds the remaining share with an equity contribution. As such, the ability to leverage the relatively small equity investment is imperative for financial buyers to realize satisfactory returns (Pearl & Rosenbaum, 2013). As a result, a requirement of this approach is the company's capacity to carry leverage, which corresponds to certain features of a company to service and repay debt. Pearl & Rosenbaum (2013) presents the key characteristics of a strong LBO candidate as:

- Low CAPEX requirements
- A strong asset base
- Leading and defensible market position
- Growth opportunities
- Efficiency enhancement opportunities
- Proven management team

These characteristics reflect different aspects of an attractive LBO investment. Strong asset base and cash flow generation as well as factors that support cash flow generation (such as low CAPEX requirements, growth in top-line, competitive advantages) represent the company's ability to support larger quantities of debt (service periodic interest rate payment and debt reduction over time). Others, such as proven management team and efficiency enhancement opportunities, refer to the capability to operate under a highly-leveraged capital structure and a strong fundamental business model (if not, sponsors seek to improve operations and thereby generate cost savings) (Pearl & Rosenbaum, 2013). In aggregate, the higher the company "score" in these categories, the greater opportunity to handle leverage and less need to reduce organisational slack, thus increased attractiveness as a LBO candidate.

Moreover, Kaplan and Ströberg (2009) identify three different classes of internal value increasing actions that financial sponsors tend to focus on: financial engineering, governance engineering and operational engineering. In common, these actions share the features of either untapped growth potential or vast organisational inefficiencies that can be solved by bigger incentives, pressure from leverage, active corporate

[29] This is by no means an exclusive valuation method. Financial buyers are involved in a variety of other deal structures as well. Further, the mechanics of the LBO valuation method will be elaborated upon if applied.

governance or by adding industry and operating expertise. Research on what private equity investors look for show that most focus is placed on the company's business model, the competitive position in the market and they see the management team, the investors ability to add value the valuation of the company of approximately equal important (Gompers, Kaplan and Mukharlyamov, 2015). In terms of value creation, Gompers et al., (2015) identify the most important source as increasing revenue, while reducing costs is identified as a secondary source in 36% of the deals before investment.

Volvo – The Case

Based on the investment rationale outlined above, this section will evaluate whether Volvo make an attractive LBO candidate.

Volvo is currently transitioning out of the most investment intense phase in its history, with a CAPEX to NOPLAT ratio averaging at approximately 5:1 over the past three years. Further, the automotive industry is very capital intensive, especially with regards to R&D. Consequently, and as recognised in the forecasts, though CAPEX is expected to some extent level out, continued investments is required to keep up with competitors. However, noteworthy is that, during the same period the top-line grow substantially, profitability increased and positive cash flows were generated. Yet, the growth in operating profit corresponds to a two-year CAGR of 86%, so even though the development is positive, cash-flow volatility is high. Going forward, it is estimated that Volvo's ability to generate positive cash flows increase, with the caveat of the uncertainty regarding heavy investments.

A contributing factor to the volatility of cash flows is the company's relatively small market share. With just over half a million cars sold in 2016 compared to the total sales of 62 million, the company appears insignificant. Yet, the company possess qualities, such as recognized brands, products, and product innovations, that likely both retain and attract new customers. These features are one the company's competitive advantages that potentially increases the stability, or the predictability, of cash flows. However, as financial sponsors are seeking a target with a secure market position, this is arguably an unlikely conclusion in this case. Nevertheless, as a manufacturing company, the book value of PP&E makes about one third of total assets. The feature of a solid asset base benefits investors as it could be pledged as collateral against a loan.

Since the company was acquired by Geely and Li Shufu, a strategic plan has been formed and executed yielding a significant improvement of the company's overall performance. As such, the management team has arguably proven itself competent and very likely capable of handling a high leverage. Further, the company has recently appointed several new members to their board of directors that are external to the majority owner. The newly appointed members bring key expertise in international business operations and

technological development [30]. Thus, the benefits to increased corporate governance and expertise contribution from a financial buyer is limited, if not, redundant.

In terms of efficiency enhancement opportunities and lowering costs, the company is still in an expansionary stage of their strategy, thus stepping in as an owner to decrease organisational slack is arguably the wrong focus and might harm the company's future prospects. With respect to recent and future growth, the transition into the premium segment fit the current consumer trends well. Increasing demand for larger and more secure vehicles, at the same time as environmental issues and concerns is very present, the company's product portfolio display promising signs.

In conclusion, financial buyers value the business based on the current and future expectations of cash flows of the company, as they perceive it at the time of an acquisition. Critical is the ability to heavily leverage the business. With a standard practice of buying businesses, which is then steered through a transition that aim to rapidly improve performance and sold within a short to medium-term period, there is is likely more to wish for. Volvo's volatility in cash flow and uncertain market position, as well as large investment needs, decreases the attractiveness of leveraging the firm even though it operates in an otherwise and mature industry. Additionally, there are limited operational benefits to a transaction. As a result, Volvo is not considered an attractive LBO candidate, thus, a financial buyer is deemed an unlikely exit strategy and will not be developed further.

13.2 Potential Buyer: Strategic Investor

In general, a strategic buyer is interested in good fit with some aspects of the seller's business. This interest can be based on vertical expansion (toward the customer or supplier), horizontal expansion (into new geographic markets or product lines), eliminating competition, or enhancing some of its own key weaknesses (marketing, R&D, to mention a few) (Mercer, 1999). In common for these reasons are that the strategic buyer the acquisition of a target as a way to acquire elements that fit or enhance its existing business (PwC, 2013).

As recognised in the strategic analysis, the threat of new entry is expected to increase as more powerful players enter the supply chain. Seeing that a possible entry strategy is to acquire one of the incumbent players, this makes Volvo a potential target. However, this is not considered likely within in the near future. Additionally, the industry has a history of horizontal integration and an increasing need of market consolidation amongst the incumbent firms (Gao, Kaas, Mohr, & Wee, 2016). Thus, only horizontal buyers will be considered in this analysis.

[30] Most notably Tom Johnstone and Betsy Atkins as mentioned in section 3.6 "Governance".

Theoretical Investment Rationale

The theoretical literature on strategic M&A's is vast and numerous investment rationales explains why deals are made as well as best practice rationales and pitfalls (Grant 2013; Kollet et al., 2005). Mellen and Evans (2010) state a range of common buyer motives, which can broadly be categorised into strategic, financial and management problems. Empirical findings by Bower (2001) support the strategic rationale and argue that acquisitions occur due to five reasons; to deal with overcapacity in mature industries; to grow in geographically fragmented industries; to extend the product offering or enter new markets; to substitute R&D efforts; or to invent a new industry by exploiting eroding industry barriers. Additionally, Grant (2013) discuss the topic of strategic rationalising and generalises the former mentioned motives into more broadly applicable terms:

- Acquisition of resources and capabilities
  - Costly and slow to develop internally
- Cost economies and market power
  - Drop duplicate functions, increase production and increase bargaining power
- Geographic expansion
  - Market entry strategy decreasing the difficulties of being a foreign player
- Diversification efforts
  - Fast way of establishing presence in a new sector

The underlying reasoning of these motives is the potential of creating substantial synergies between the companies. Further, Vild & Zeisberger (2014) argue that "sophisticated" strategic buyers focus the valuation exercise on preparing a DCF analysis, including both the target's stand-alone value and an DCF analysis of the target assuming various synergies. As such, contingent on whether a strategic buyer is identified, the topic of synergistic benefits will be elaborated upon and a DCF analysis is performed.

The Case – Volvo

Having identified Volvo's brand identity, brand management, as well as R&D capabilities as key to Volvo's future success, the company is in possession of key resources and capabilities. As shown in the internal analysis, the future emphasis on safety and environmental issues is playing in Volvo's favour, which likely increase the attractiveness of tying the Volvo brand to a brand portfolio. With respect to brand segments, it is common among industry participants to own brands operating in different segments. Therefore, including Volvo in a portfolio where the brand does not cannibalise on existing brands make the company a good strategic fit. Further, as no information on Volvo's electrification and autonomous drive technology is available to the general public, it is not possible to base the M&A analysis on the basis of intangible assets.

Cost economies and market power is possibly a significant motive as it could increase the value of both the acquirer and Volvo. One of Volvo's key weaknesses has been identified as its relatively small size, and therefore, its limited R&D budget and CAPEX. Though there is not a one-to-one relationship between R&D expenses and innovation, substantial economies of scale are present, as cost could be spread over a larger cost base and technology and other innovations could be used in more vehicles. Economies of scale is identified as many of the overhead functions such as distribution, dealership network, marketing and finance functions could be used across brands and companies.

From a market power perspective, Volvo could also be an attractive target for a medium sized player with its €20 billion in sales. Though the company has a global presence and the main source of growth is expected to come from the Asian-Pacific region, the company has its strongest market position in Western Europe. Thus, a company seeking to increase its market presence in the region, acquiring Volvo could be a way of increasing this presence. Additionally, considering that the Volvo has enhanced its presence in China through an increased manufacturing capacity, this increases the attractiveness to a strategic buyer with less presence in the country as the proximity to the market shortens. However, only horizontal M&A is considered in this case, an acquisition by a strategic buyer would have marginal impact on industry rivalry as Volvo only accounts for a fraction of the total market share.

In sum, the most evident source of synergies is through cost economies, or put differently, synergistic sources that are readily available. Economies of scale can be realised through the reduction of duplicate functions, increased production capacity and increased bargaining power. Further, based on the Volvo's strengths in R&D, this increases the attractiveness of acquiring the company. The attractiveness is also likely enhanced if a buyer is seeking geographical expansion or expansion into other price segments. Conclusively, it is concluded that Volvo make an attractive case for a strategic buyer, thus the next step is identifying a buyer.

Identifying the buyer

Considering that Ford sold Volvo to Geely, and GM recently sold Opel to PSA, North American AMs seems to have a hard time navigating the European market (Volo's main market). GM's recent divesture rationale was changing geopolitical and regulatory climate requires additional investment reduce the attractiveness of a presence. Additionally, the company expressed a need for an increased focus on emerging economies and the North American market. (Bunkley, 2017). As such, a North American acquirer is deemed unlikely.

Based on the previous analysis of Volvo as an investment case, Renault is identified as having the largest potential gain from an M&A with Volvo. The company generated approximately €51 million in sales 2016, roughly 2,7 times the size of Volvo, which make the company one of the smaller global players. Renault is currently operating three brands: Renault, Dacia and the South Korean Renault Samsung Motors. None of

the these can be classified as operating in the premium segment, and therefore, Volvo make a good complement. Further, Renault has expressed both an increased strategic focus on the Chinese market and an aim of becoming the number two company in Europe in terms of sales (Renault, 2015). Thus, an acquisition of Volvo yields positive effects in terms of both market share and market presence, in line with Renault's strategy. This is especially the case in China, where Volvo would add four manufacturing plants to the group in addition to the one that Renault recently set up (Renault, 2015).

Interestingly, this deal was attempted in the opposite direction back in 1993 when Volvo was part of the much larger and diversified enterprise Volvo Group AB[31] that wanted to acquire Renault (Volvo AB, 1997). The merger failed before it was signed mostly due to heavy resistance from Volvo's owners because the French government had the power to stop privatization of the company by limiting the voting rights of any other shareholder to 20%. Additionally, corporate culture was highlighted as another friction between the parties (Dwyer, 1993). Now, 25 years later, Volvo is a privately owned company with a less complex company structure, as it only manufactures automobiles, thus removing some of the friction from the previous deal.

Important to note is that there are much likely other companies that would benefit from an acquiring Volvo. Renault is identified as the most likely due to the company's expressed desired of both increased revenue source (market share) and geographical diversification (market presence) strategy. As a result, the authors argue Renault has the greatest potential of realising the largest synergistic benefits, yielding a higher willingness to pay because of the value generated post-acquisition. The following sections will be devoted to defining, estimating and validating the synergies in this transaction.

14 M&A Valuation

14.1 Sources of synergies

In assessing the potential for, and magnitude of synergies, it is imperative to define what synergistic benefits are. Mellen and Evans (2010) define synergies as the increased performance of two combined entities relative to if they were operating separately. Following the definition of investment value, the value of the transaction to the acquiring party can be formulated as the net present value of the synergistic benefits less the acquisition premium paid. Mellen and Evans (2010) argue that synergistic benefits generally come from five sources: revenue enhancements, cost reductions, process improvements, financial economies and risk reduction. The first three sources refer to operational synergies and will directly affect the free cash flow of the firm through increased margins, either by increasing revenue or decreasing costs. Financial

[31] The company incorporated cars, trucks, buses, construction equipment, marine and industrial engines as well as military and commercial aircraft engines. (Source: Volvo AB, 1997)

economies and risk reduction are financial synergies that either come in the form of decreased cost of capital or improved working capital management (Evans & Mellen, 2010).

14.2 Estimating synergies

Operational Synergies

When estimating operational synergies, Koller et. al. (2005) suggests developing an industry specific business system followed by an analysis of the cost base of the target company. The size of the synergistic benefits should preferably be estimated using expertise from experienced line managers (Koller et. al. 2005). Since this thesis solely rely on publicly available information, this is not possible and creates a significant restraint to the precision of the estimates. However, the authors argue that benchmarking against industry peers to reveal if industry economics support the suggested synergistic benefits will serve as the best approximation. Further, the quality of the estimated benefits depend on the extent to which costs can be assigned to specific functions. In this case, Volvo does not offer such information but merely assign cost according to the income statement items (see appendix 4). Thus, the proportional impact of a specific synergistic benefit on income and balance sheet items will also rely on industry economics.

Mellen and Evans (2010) stress the importance of timing as future synergistic benefits are worth less than current benefits. Cultural differences are identified as a key factor that potentially delay the timing of benefit, whereas a clear power structure can act to ease these difficulties. This is supported by Teerikangas and Very (2006), who find that national cultural differences matter, but that organisational culture is a greater determinant of the success of M&As. However, despite the importance of incorporating cultural aspects when estimating the timing of synergies, the outside perspective of this thesis hinders a useful and trustworthy comparison of organisational culture. Thus, in order to account for the fact that synergies seldom appear instantaneously, as highlighted by scholars, this thesis estimates that it takes two years before the estimated synergies are realised. The synergistic benefits are identified as follows:

R&D: As the R&D intensity is expected to increase this becomes a major source of economies of scale. By being able to spread the cost as well as utilising the benefits of R&D over more vehicles, the R&D budget is expected to increase in absolute terms whilst decreasing per unit under Renault's ownership. This is evident considering that the R&D trend in the industry is homogenous, as described in the strategic analysis. Further, by combining the two entities, the elimination of duplicate functions is estimated to yield additional benefits. Volvo is currently spending a relatively small proportion of revenues on R&D relative to peers and though economies of scale can be realised, industry economics limit it to a modest decrease. The synergistic benefit is estimated to impact both the income statement and balance sheet through both decreased expenses and capitalisation. As a percentage of revenue, expenses are estimated to decrease by 0,2% and intangible assets by 0,5%. In addition, the increased R&D budget in absolute terms is expected to have a positive effect on Volvo's chance of remaining competitive throughout the technological shift. As such, this

affects the expected growth of the company. However, as stated by Mellen and Evans (2010), revenue enhancement synergies should be estimated with caution as they are dependent on a number of factors external to the deal, such as customer and competitor response. The revenue synergistic benefits are thus estimated to increase revenue growth by 0,2%.

Manufacturing and Procurement: Critical to the auto industry is the ability to spread overhead costs, as described in previous sections. Volvo and Renault have both independently embraced this aspect through the development of platforms that can be applied to several models, all in order to realise this benefit. With regard common platforms, the Renault-Nissan alliance claim to benefit a 40% decrease in engineering costs and a 30% reduction in purchasing costs through higher volume purchases (Renault Nissan, 2015). The benefits of combined purchases will likely affect, not just the benefits of using a common platform, but the entire procurement process. This suggest a decrease in both cost of sales and SG&A as material costs will decrease, as well as shared product and process engineering will yield a decrease in overhead costs. There are no expected synergistic benefits through decreasing overcapacity through joint production, since Volvo is currently expanding its manufacturing network in order to facilitate its expansion. Meanwhile Volvo already has a low cost of sales relative to industry peers, industry economics suggest a modest decrease. However, the analysis of Volvo showed that the company has a relatively high SG&A costs, which indicates that Volvo have from relatively high overhead costs. Thus, the benefits are estimated to a 0,5% decrease in both cost of sales and SG&A as a proportion of revenue.

Sales and Marketing: Marketing is identified as a key tool and capability to create differentiation in the marketplace. Given the recent success of the company, of which is likely attributed to the "Volvo Way to Market" to a large extent, and that brand management is identified as one of the company's key strengths, the potential benefit of Renault's contribution in the area is limited. However, marketing skills are arguably transferrable and independent of targeted customer segment, since it is human capital it is expected that duplicate functions can be removed. This is estimated to yield a decrease in SG&A of 0,2% as a percentage of revenues.

Administration: Both firms have corporate functions supporting the core business such as finance, HR, IT and investor relations. Several of these would arguably be redundant under Renault's ownership as only one investor relations and finance department is needed, as well as implementing common HR and IT practices would likely reduce the need for personnel. The cost of these overhead functions is assumed to be captured by a decrease in SG&A. The synergistic benefit is estimated to a 0,2% decrease in SG&A as a percentage of revenue.

A summary of the key profitability measures under Renault's ownership are presented in table 25. The table show that Volvo is expected to deliver profit margins closer to those of the peer group companies in the growth period, but that these are expected to deteriorate as the company matures.

Table 25. M&A: Pro forma profitability measures

Financial Value Drivers Under Renault's Ownership											Average Peer Group
	E2017	E2018	E2019	E2020	E2021	E2022	E2023	E2024	E2025	E2026	*2016*
Gross Profit	25,0%	25,0%	24,5%	24,5%	23,5%	22,5%	22,5%	22,5%	22,5%	22,5%	*19,6%*
EBITDA Margin	12,3%	12,3%	13,4%	13,4%	12,4%	11,7%	11,7%	11,7%	11,7%	11,7%	*13,0%*
EBIT Margin	7,3%	7,3%	8,4%	8,4%	7,2%	6,8%	6,7%	6,6%	6,6%	6,6%	*7,7%*
NOPLAT Margin	5,6%	5,6%	6,4%	6,4%	5,5%	5,2%	5,1%	5,0%	5,0%	5,0%	*5,9%*
ROIC	32,7%	32,8%	36,3%	35,8%	28,5%	23,3%	20,8%	20,0%	17,9%	17,9%	*8,9%*

Source: Own construction

Financial Synergies

Working capital management is not reasoned an area of improvement, since Volvo by far has the lowest working capital compared to the peers, including Renault. Thus, potential synergistic benefits are most likely to come in the form of a reduced cost of capital. Evans and Mellen (2010) highlight that these benefits generally come through risk reduction by a reduced customer concentration and an improved position relative to peers. However, according to Damodaran (2005a), diversification is not a source of synergies as investors can diversify on their own. Instead, Damodaran (2005a) emphasises the possibility of decreasing the cost of debt through an increased debt capacity of the combined entity by having more stable and predictable earnings. The implications of Renault's ownership on cost of capital are as follows:

Cost of Debt: Cost of debt for Volvo as a stand-alone entity was derived using the BB positive and Ba2 stable ratings issued by S&P and Moody's, and Renault is barely reaching an investment grade from the rating institutions with BBB- and Baa3 ratings. Thus, even though more geographically dispersed and potentially more stable earnings would imply a decreased cost of debt, Renault's ability to facilitate debt as implied by the ratings does not differ significantly from Volvo's. Further, since source of financing the acquisition is outside the scope of this thesis, it is not possible to include the effect of potential debt financing in estimating the cost of debt. Consequently, the cost of debt is expected to be unaffected by Renault's ownership and remains at 2,64% after tax.

Cost of Equity: The cost of equity derived in the stand-alone valuation takes both overall industry and peer group beta into account. It is seen as the most appropriate estimate of Volvo's future risk (or required rate of return for equity providers) and is thus independent of ownership. Renault is a large publicly traded company by European standards and is included, amongst other indices, in the Euronext 100 index comprising Europe's 100 largest and most traded stocks (Euronext, 2017). Thus, as in the case of Volvo as a stand-alone entity, a liquidity premium is not necessary as the liquidity risk in the stock is likely low. Therefore, the cost of equity for Volvo of 12,2% remains unchanged and considered appropriate under Renault's ownership as well.

14.3 DCF Analysis

In sum, the WACC derived based on Volvo as a stand-alone entity is deemed to most viable estimation of Volvo's cost of capital and will thus remain unchanged at 7,44%. The DCF valuation seen in table 26 show an investment value of €23.536 million to Renault. The acquisition premium is €7.291 million and consists of the synergistic benefits that Volvo would gain under Renault's leadership. The investment value corresponds to a 46,5% acquisition premium. In addition, an EVA valuation has been performed which supports the value derived in the DCF (Appendix 18).

Table 26. M&A: Discounted cash flow analysis

€ million	*2016*	E2017	E2018	E2019	E2020	E2021	E2022	E2023	E2024	E2025	Teminal Value
NOPLAT	893	1.162	1.278	1.614	1.765	1.654	1.620	1.657	1.679	1.730	1.782
Depreciation & Amortization	1.093	1.028	1.131	1.241	1.357	1.542	1.539	1.608	1.699	1.750	1.803
Changes in Net Working Capital	1.056	299	379	384	15	244	(132)	150	(511)	130	134
Net CAPEX	(2.226)	(1.669)	(2.059)	(2.111)	(2.246)	(2.923)	(2.440)	(2.174)	(2.456)	(2.170)	(2.235)
Free Cash Flow to the Firm	816	820	729	1.128	892	517	587	1.240	411	1.440	1.483
Present Value Free Cash Flow to the Firm		*763*	*631*	*910*	*669*	*361*	*382*	*751*	*232*	*755*	17.532

Enterprise Value	**22.986**
- NIBD (2016)	(942)
- Minority Interest	392
Investment Value	**23.536**
Acquisition Premium	**7.291**

Terminal Value as % of Enterprise Value 76,27%

Source: Own construction

Some authors argue that an additional premium should be added to fully capture the value of control of an enterprise (Mellen & Evans, 2010). However, as Damodaran (2005b) highlight, in order not to double account synergistic benefits, the value of control should only be based on whether there is substantial value to changing company management and that it is not possible to capture that value in the model. In this case, Volvo's management team has proven itself highly competent the last couple of years. Thus it is not deemed appropriate to add an additional premium to the investment value.

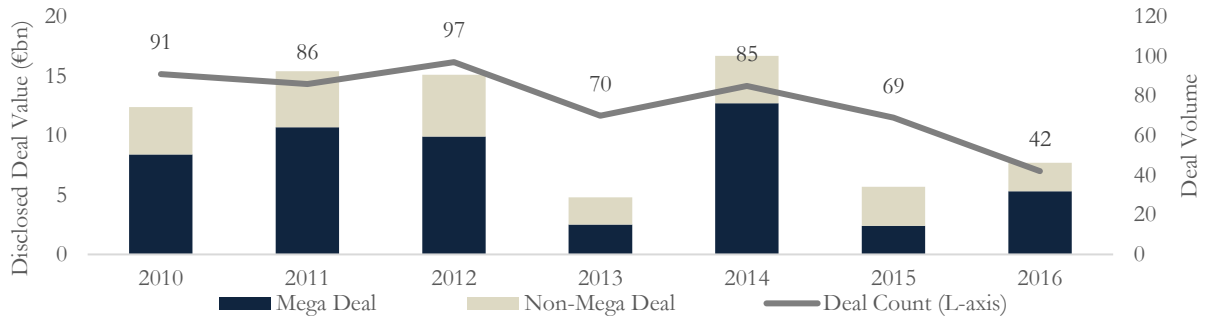
The derived enterprise value translates into an LTM and one-year forward looking EV/sales multiple of 1,2 and 1,1. The respective EV/EBITDA multiple is 10,3 and 9,0.

14.4 Existing Market Conditions: Precedent Transactions

Like the market valuation, precedent transaction analysis applies a multiples-based approach to determine an implied valuation range. The concept of this analysis is that multiples paid for comparable companies in prior M&A transactions (most suitable are those that share similarities in terms of size, type and characteristics of the buyer) are an indicator of a company's value. Transactions that occurred more recently (within two to three years) are considers more valuable as these transactions likely took place under similar market conditions to the contemplated transaction (Pearl & Rosenbaum, 2013).

Figure 29 show the (annual) historical deal activity between 2010 and 2016 for auto manufactures[32]. Recently there has been an increase in deal value from €5,7 billion in 2015 to €7,7 billion in 2016, whereas the number of deals decreased from 69 in 2015 to 42 number of deals in 2016. According to PwC (2016), a number of factors are impacting the number of deals in the automotive industry, including global economic factors, and regional differences within the global industry.

Figure 29. Global auto manufacturers M&A activity



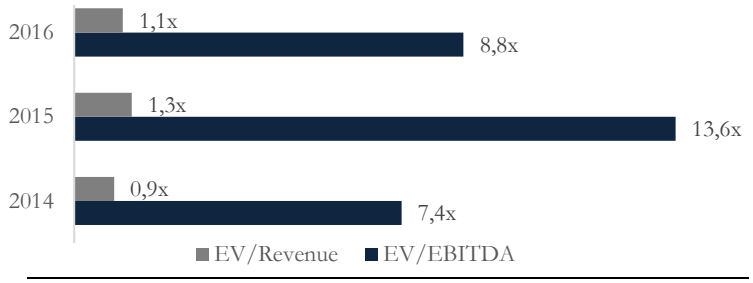
Source: Data from Thomson Reuters. Own depiction

The negative trend in terms of deal count resulted in the lowest deal volume over the period. With respect to value, the figure is primarily driven by the number (or value) of megadeals (>€1 billion). The disclosed deal value increased in 2016 as the year included 2 megadeals: Toyota acquired the remaining stake in Daihatsu and Nissan's investments in Mitsubishi (PwC, 2016b). However, Daihatsu case is not a useful comparable transaction because of the different characteristics of the deal. First of all, this is due to different price segment, operational struggles, and complete focus on the Asian market, and secondly, Daihatsu has struggled with sales and profitability (Bloomberg, 2016c). Further, Nissan's investment in Mitsubishi is not a transaction with complete transfer of ownership. Conclusively, in the first case the transaction multiple is not comparable, whereas the Nissan case does not provide a reliable multiple. Therefore, the median industry transaction multiple is considered the most appropriate.

[32] Data is on based on the SIC code (same as the one used in finding the initial peer group) from Thomson Reuters M&A database. Evidently this dataset does not, for example, explicitly show one AM acquiring another AM, but rather the overall activity of AMs including both horizontal and vertical acquisitions.

In terms of transaction multiples EV/EBITDA and implied EV/revenue have decreased from historically high levels in 2015, as seen in figure 30 (PwC, 2016b)[33]. The decline of transaction multiples is likely attributed to the overall M&A activity of AMs as well as increasing economic uncertainty (political risk for example). Looking at global M&A activity (all industries), the average acquisition premium in 2016 was 23,2%, which compared to average of 24,1% over the period between 2007 and 2016 shows stable developments (see appendix 19). Going forward, M&A activity is expected be positively driven by companies and private equity firms with large cash balances, continued pressure from shareholders and new competitors and the increased pace of innovation (PwC, 2016b). This as companies is moving away from the consolidation wave post the 2008 financial crisis, and instead, in order to keep with industry transformation, seek expansion into new technologies, new services, and new business models.

Figure 30. Transaction multiples (LTM median)



Source: Data from PwC M&A (2016). Own depiction

15 Concluding Value II

This part started with an investment case analysis from the perspective of a financial buyer to determine if Volvo made an attractive investment case or not. As Volvo was identified as an unattractive investment, it was deemed an unlikely exit strategy and thus not elaborated upon further. However, when looking at case from the perspective of a strategic buyer, Volvo appeared a much more attractive investment case. The most likely acquirer was identified as Renault, based on the company's relatively small size, aim of increasing its market presence in Europe and China, and owning a premium a brand, it was identified as having the most to gain from a transaction. After estimating the synergistic benefits that Volvo would experience under Renault's ownership, the investment value was derived to €23.536 million. This corresponds to an acquisition premium of €7.291 million. Comparing the implied EV/sales and EV/EBITDA multiples from the DCF analysis to precedent transaction multiples, the valuation is well in line. This suggests that the estimated acquisition premium is not exaggerated, despite it being much greater than the global industry average.

[33] Disclosed transaction multiples for the entire auto industry including auto manufacturers, component suppliers, aftermarket and other.

PART VI: CONCLUSION

The final part of this thesis will end with a concluding remark on the exit strategy that generates the most value, thus providing an answer to the research question.

16 Conclusion

The origin of this thesis stems from the rumour that has been covered in the media over the past few years, namely, that the privately owned car manufacturer Volvo Cars AB were likely to become a listed company. For a market introduction, a value of the company is necessary. As noted by scholars, though the valuation process is similar to that of a public company, valuing private companies introduces a range of additional issues that finance literature rarely covers. Moreover, interestingly was that business media devoted little to no attention on the possibility of another exit option for the company's owners. Listing a company is by no means an exclusive exit strategy for private company owners, and therefore, it was concluded that it would be interesting to explore alternative options. Thus, this thesis sought to answer a research question that covered both aspects; firstly, value Volvo Cars AB on a stand-alone basis (as in the case of an IPO) and, secondly, to explore whether the company was an attractive investment case to a third party, and if so, a valuation from the perspective of the prospective buyer would be performed.

As the research question entails flexibility and requires subjective judgements, a pragmatic case study strategy was applied. In the quest for finding an answer to this question, numerous well-established theoretical models and primary methodologies related to the subject were applied. Additionally, in line with the research strategy, attention was paid to what practitioners actually do when facing the challenges of valuing private companies.

Imperative in any valuation is gaining a sound understanding of the company and the industry in which it operates. Since the acquisition from Ford in 2010, the company embarked on a strategic journey that would transform the company considerably. The transition from the value segment to the premium segment required significant investment, yet success of this decision is not only reflected in rising sales, but also profitability. Moreover, a strategic analysis illustrated the challenges of navigating the automobile industry. Intense rivalry, government regulations, structural changes, increased threat of new entry, and technological disruption were among other factors identified as the micro-and macroeconomic factors that profoundly influence the industry and its future profitability. Critical to succeed in the industry was, therefore, identified as having differentiated products, a strong brand, and an efficient utilisation of invested capital.

A financial analysis of the company and its peers, revealed Volvo's relative strength of converting invested capital into sales, including premium peers, was the primary driver of its ability to generate superior return. Further, the progress in key value drivers was attributed to one of Volvo's strongest competitive advantages - its brand. With a rich heritage of focus and innovations related to safety and the environment, the company

has not only gained momentum due to current consumer trends but also managed to successfully establish itself on the market, despite its relatively small size. A key enabler for this development was identified as strong brand management competencies.

With the identified strategic and financial value drivers in mind, a forecast of the company's future performance was made. In this part, the company's cost of capital was also estimated to 7,44%. In the explicit forecasting period, Volvo's momentum was expected to continue and excess returns realised, whereas in the long-term excess returns eventually deteriorates as competition increases and the company's competitive advantage fades. This is primarily driven by the fact that is it extremely difficult to predict who will emerge the winner in the technological race that currently is on-going. From these predictions, the equity value was derived to of €16.245 million using a DCF and EVA analysis. To benchmark the intrinsic valuation, a relative valuation was applied. This revealed that current market conditions and sentiments assigned a greater value to value the company, yielding a value range of €20.001 – €20.364. Jointly, these two valuation methodologies form the company's fair IPO value range between €16.245 – €20.364 million.

Inherent in a DCF analysis is uncertainty. As a way of analysing this uncertainty, a risk analysis that considered both discrete and continuous risk was performed. The risk analysis showed that the estimates in the determinant DCF analysis were rather robust to changes in key value drivers. Additionally, the analysis also illustrated that despite the discrepancy between the absolute and relative valuation, the different values were within a close range.

Using the fundamental analysis of Volvo, the successive sections focused on the second objective of this thesis, namely to identify a potential buyer and the value this buyer assign to the business. From the perspective of a financial buyer, using LBO investment rationale, Volvo was not recognized an attractive investment due to, amongst others, further requirements in capital expenditures and weak prospects for efficiency enhancement, yielding unpredictable cash flows and low prospects for operational value creation. On the other hand, the investment case from a strategic buyer's perspective appeared more attractive, primarily due to readily available synergistic benefits. Following, a screening of potential acquirers identified Renault as a potential party. This lead into the subject of synergies, which were both validated and estimated. Using a DCF analysis, with incorporated synergistic benefits, Volvo's investment value to Renault was estimated to €23.536 million. Using similar rationale to that of a relative valuation, a precedent transaction analysis was performed. From this it was concluded that the estimated investment value was well in line what similar buyers have paid over preceding three years. In sum, figure X illustrates the difference between the estimated values.

Figure 1. Value illustration

Fair Market Value versus Investment Value	
Investment Value	€23.536
Acquisition Premium	€7.921
Fair Market Value	€16.245

Source: Adopted from Evans and Bishop (2002)

While it is easy to draw to the conclusion that, since one value is greater than the other this is the optimal way to proceed, this conclusion omits the relevant factor of whether the overall market for selling companies is favourable. The effect of market conditions (or the perception of it) on the willingness of the owners to initiate a potential exit option clearly manifested itself when the rumours of a potential market introduction of Volvo started spreading. At that time, according to Volvo's owner, the market had a different perception of the company and was not accurately recognising its value. Thus, an exit was discarded. However, this concern was raised before the company's strong performance in 2016 was revealed. Based on recent development and future projections, there is arguably a "window of opportunity" in which a higher price for the business may be realised. Additionally, taking into account how the market is currently pricing similar companies, going public has arguably become a more attractive exit scenario.

Nonetheless, a strategic buyer like Renault is likely willing to pay more for the company due to the possibility of realising synergistic benefits – both readily available synergies, such as economies of scale, as well as speculative synergies. Yet, the derivation of the investment value or whether an acquisition makes strategic sense from the respective buyers' perspective is inevitably a subjective assessment. This aspect, however, has direct ties the purpose of this thesis, namely to explore how value is perceived depending on perspective. Thus, it is concluded that, given the demand and the investment case, a strategic buyer will assign a greater value to Volvo and, therefore, this is concluded as the value maximising exit strategy

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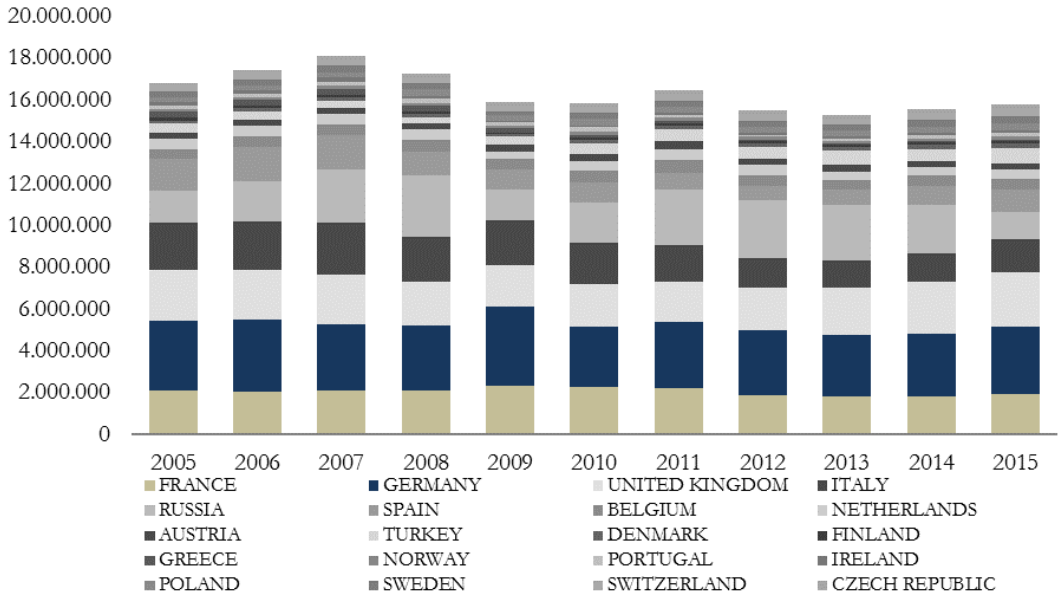
Appendix 1. Correlation: Vehicle sales and key market GDP growth

Regional GDP growth	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Europe	2,40%	-2,10%	-2,40%	2,10%	1,50%	-0,90%	-0,30%	1,20%	2,00%	1,70%
North-America (N-A)	1,80%	-0,30%	-2,80%	2,70%	1,90%	2,30%	1,85%	2,40%	2,15%	1,60%
Asia-Pacific (A-P)	6,60%	-0,60%	5,40%	7,30%	5,10%	4,90%	5,10%	4,90%	5,50%	4,90%
China	13,90%	7,10%	11,90%	10,60%	9,50%	7,90%	7,80%	7,30%	6,90%	6,70%
Sweden	3,30%	-0,60%	-5,20%	5,40%	2,80%	0,10%	1,20%	2,80%	3,80%	3,10%
Vehicle sales year-on-year in %										
Europe	8,07%	-6,00%	-2,86%	-1,03%	4,14%	-4,95%	-1,65%	1,92%	2,75%	4,65%
North-America (N-A)	-2,13%	-15,99%	-20,39%	10,40%	9,10%	12,35%	7,18%	5,97%	6,26%	1,83%
Asia-Pacific (A-P)	9,09%	1,61%	21,80%	25,38%	0,03%	10,08%	7,63%	4,11%	2,33%	8,75%
China	22,29%	6,59%	45,48%	32,45%	2,72%	4,15%	13,94%	6,80%	4,57%	13,74%
Sweden	8,50%	-17,22%	-15,98%	35,74%	5,28%	-8,23%	-3,68%	12,74%	13,54%	7,88%

	Europe	N-A	A-P	China	Sweden
Correlation	0,83	0,92	0,51	0,69	0,87

Source: Bloomberg/IMF (2017). Compiled by the authors

Appendix 2. Historical segmentation of new cars in Europe (units)



Source: OICA (2017a). Compiled by the authors

Appendix 3. Balance sheet line item classification (Volvo as an example)

ASSETS		EQUITY & LIABILITIES	
Non-Current Assets	**Classification**	***Equity***	**Classification**
Intangible Assets	Operational	Equity Attributable to Owners of Parent Company	Financial
PP&E	Operational	Non-Controlling Interest	Financial
Investments in JV and Associates	Operational	***Non-Current Liabilities***	
Other Long-Term Securities Holdings	Financial	Provisions for Post-Employment Benefits	Financial
Deferred Tax Assets	Operational	Deferred Tax Liabilities	Operational
Other Non-current assets		Other Non-Current Provisions	Operational
Receivables from Related Companies	Operational	Liabilities to Credit Institutions	Financial
Restricted Cash	Operational	Liabilities to Parent Company / Bonds 2016	Financial
Endowment Insurance for Pensions	Financial	*Other Non-Current Liabilities*	
Rental Deposition	Operational	Liabilities Related to Repurchase Agreements	Operational
Derivative Assets, non-current	Financial	Deferred Leasing Revenue	Operational
Other non-current assets	Operational	Derivative Liabilities	Financial
Current Assets		Other Liabilities	Operational
Inventories	Operational	***Current Liabilities***	
Accounts Recievable		Current Provisions	Operational
Accounts Receivable from non-group companies	Operational	Liabilities to Credit Institutions	Financial
Accounts receivable from related companies	Operational	Advance Pmnts from Customers	Operational
Other Current Assets		Trade Payables	Operational
VAT Receivables	Operational	Current Tax Liabilities	Operational
Prepaid Expenses and accrued income	Operational	*Other Current Liabilities*	
Other financial Receivables	Financial	Accrued expenses and prepaid income	Operational
Other Receivables	Operational	Liabilities related to repurchase agreements	Operational
Current Tax Assets	Operational	Personnel related liabilities	Operational
Marketable Securities	Financial	VAT liabilities	Operational
Cash and Cash Equivalents		Hedging instruments	Financial
Working Cash (2% of Sales)	Operational	Deferred leasing revenue	Operational
Excess Cash (Everything above 2% of Sales)	Financial	Other liabilities	Operational
		Liabilities to parent company	Financial

Source: Own construction following the outlining in section 7.2

Appendix 4. Volvo analytical financial statements

Consolidated Income Statement			
€ millions	**2014**	**2015**	**2016**
Net Revenues	14.288	17.035	18.761
Cost of Sales	(11.840)	(13.317)	(14.879)
Whereof D&A	*(426)*	*(555)*	*(621)*
Gross Income	2.448	3.718	3.883
R&D Expenses	(747)	(914)	(973)
Whereof D&A	*(288)*	*(376)*	*(421)*
Selling Expenses	(904)	(1.137)	(1.245)
Whereof D&A	*(8)*	*(12)*	*(13)*
Administrative Expenses	(617)	(751)	(672)
Whereof D&A	*(39)*	*(31)*	*(34)*
Other Operating Income	181	208	302
Other Operating Expenses	(159)	(460)	(193)
Whereof D&A	*(3)*	*(3)*	*(4)*
Income from JV and Associates	20	24	43
Operating income (EBIT)	221	687	1.144
Whereof Total D&A	*(765)*	*(976)*	*(1.093)*
Financial Income	36	25	23
Financial Expenses	(137)	(153)	(178)
Whereof Interest Expense	*98*	*126*	*147*
Income Before Tax	120	560	989
Income Tax	(67)	(95)	(214)
Net Income	53	465	775
Effective Tax Rate	*56,0%*	*16,9%*	*21,6%*

Analytical Income Statement			
€ millions	**2014**	**2015**	**2016**
Net Revenues	14.288	17.035	18.761
Cost of Sales	(11.414)	(12.762)	(14.258)
Gross income	2.874	4.273	4.504
Gross Margin	*20,1%*	*25,1%*	*24,0%*
R&D Expenses	(459)	(538)	(553)
Selling Expenses	(896)	(1.125)	(1.232)
Administrative Expenses	(578)	(720)	(638)
Non-Recurring Items	*111*	*3*	-
Other Operating Income	181	208	302
Other Operating Expenses	(157)	(457)	(190)
Income from JV & Associates	20	24	43
EBITDA	1.097	1.666	2.237
EBITDA Margin	*7,7%*	*9,8%*	*11,9%*
Depreciation & Amortisation	(765)	(976)	(1.093)
Operating Income (EBIT)	332	690	1.144
EBIT Margin	*2,3%*	*4,1%*	*6,1%*
Corporate Tax	(67)	(95)	(214)
Tax Shield, net Financial Expenses	(24)	(30)	(37)
NOPLAT	241	565	893
NOPLAT Margin	1,7%	3,3%	4,8%
Depreciation & Amortisation			1.093
Capital Expenditures			(2.226)
- Change in Working Capital			1.056
FCF			816

Analytical Balance Sheet			
	2014	**2015**	**2016**
Working Cash	286	341	375
Inventories	1.840	2.109	2.201
Accounts Receivable	797	920	905
Current Tax Asset	37	32	30
Other Current Assets	482	443	598
Operating Current Assets (OCA)	3.442	3.844	4.110
Trade Payables	1.928	2.729	3.168
Current Provisions	1.089	1.293	1.596
Current Tax Liability	65	46	65
Advance Payments from Customers	39	55	68
Other Current Liabilities	1.979	2.167	2.716
Operating Current Liabilities (OCL)	5.100	6.291	7.613
Operating Working Capital (OCA-OCL)	(1.658)	(2.447)	(3.503)
PP&E	3.953	4.112	4.979
Intangible Assets	2.144	2.371	2.634
Investments in JV & Associates	64	73	259
Deferred Tax Asset	323	399	427
Other Non-Current Assets	1.191	59	215
Total Operating Non-Current Assets	7.674	7.014	8.515
Other Non-Current Provisions	608	614	726
Other Non-Current Liabilities	166	292	604
Deferred Tax Liability	347	184	126
Total Non-Current Operating Liabilities	1.121	1.089	1.456
Invested Capital (Net Operating Assets)	4.894	3.478	3.556
Equity Attributable to Owners of Parent Company	3.406	3.380	4.106
Non-Controlling Interest	152	217	392
Total Equity	3.558	3.597	4.497
Liabilities to Credit Institutions (Non-current)	1.801	1.575	1.444
Liabilities to Parent Company / Bonds 2016	119	-	799
Liabilities to Credit Institutions (Current)	162	649	292
Provisions for Post-Employment Benefits	642	488	659
Other Current Liabilities	294	39	-
Other Non-Current Liabilities	-	12	-
Interest-Bearing Debt	3.018	2.763	3.195
Other Long-Term Securities Holdings	1	2	8
Other Non-Current Assets	20	78	-
Other Current Assets	72	117	-
Marketable Securities	109	365	492
Excess Cash (In Excess of 2% of Sales)	1.480	2.320	3.637
Total Other Financial Assets	1.682	2.882	4.137
Invested Capital (Financing)	4.894	3.478	3.556
NIBD	1.336	(118)	(942)

Appendix 5. BMW analytical financial statements

Reported Income Statement	Fiscal Year Ending dec-31			LTM
	2014A	2015A	2016A	2016A
Sales	**€ 80.401,00**	**€ 92.175,00**	**€ 94.163,00**	**€94.163,0**
Cost of Sales	58.830,0	68.874,0	72.370,0	72.370,0
Gross Profit	**€21.571,0**	**€23.301,0**	**€21.793,0**	**€21.793,0**
R&D Expenses	4.566,0	5.169,0	3.072,0	3072
SG&A	7.892,0	8.633,0	9.158,0	9.158,0
(Income) from Joint Ventures	(655,0)	(518,0)	(441,0)	
Depreciation & Amortization	-	-	-	-
Other Expense - Income	(28,0)	(82,0)	190,0	190,0
EBIT	**€9.796,0**	**€10.099,0**	**€9.814,0**	**€9.814,0**
Financial expenses - income	763,0	452,0	(178,0)	(178,0)
Interest Expense	326,0	423,0	327,0	327,0
Pre-tax Income	**€8.707,0**	**€9.224,0**	**€9.665,0**	**€9.665,0**
Income Taxes	2.890,0	2.828,0	2.755,0	2.755,0
Noncontrolling Interest / Minority Interes	19,0	27,0	47,0	47,0
Preferred Dividends	-	-	-	-
Net Income	**€5.798,0**	**€6.369,0**	**€6.863,0**	**€6.863,0**
Effective Tax Rate	*33,2%*	*30,7%*	*28,5%*	*28,5%*
Adjusted Income Statement				
Reported Gross Profit	€21.571,0	€23.301,0	€21.793,0	€21.793,0
Non-recurring Items in COGS (1)	-	-	-	-
Adj. Gross Profit	**€21.571,0**	**€23.301,0**	**€21.793,0**	**€21.793,0**
% margin	*26,8%*	*25,3%*	*23,1%*	*23,1%*
Reported EBIT	€9.796,0	€10.099,0	€9.814,0	€9.814,0
Non-recurring Items in COGS	-	-	-	-
Other Non-recurring Items net (2)	(20,0)	(101,0)	(69,0)	(69,0)
Adjusted EBIT	**€9.776,0**	**€9.998,0**	**€9.745,0**	**€9.745,0**
% margin	*12,2%*	*10,8%*	*10,3%*	*10,3%*
Depreciation & Amortization	4.323,0	4.686,0	4.998,0	4.998,0
Adjusted EBITDA	**€14.099,0**	**€14.684,0**	**€14.743,0**	**€14.743,0**
% margin	*17,5%*	*15,9%*	*15,7%*	*15,7%*
Reported Net Income	€5.798,0	€6.369,0	€6.863,0	€6.863,0
Non-recurring Items in COGS	-	-	-	-
Other Non-recurring Items	(20,0)	(101,0)	(69,0)	(69,0)
Non-operating Non-rec. Items (3)	150,0	24,0	179,0	179,0
Tax Adjustment	(30,7)	18,2	(26,0)	(26,0)
Adjusted Net Income	**€5.897,3**	**€6.310,2**	**€6.947,0**	**€6.947,0**
% margin	*7,3%*	*6,8%*	*7,4%*	*7,4%*
Adjusted EBIT	€9.776,0	€9.998,0	€9.745,0	€9.745,0
Corporate Tax	2.890,0	2.828,0	2.755,0	€2.755,0
Tax Shield, net Financial Expenses	257,2	206,7	35,2	€35,2
NOPLAT	6.628,8	6.963,3	6.954,8	€6.954,8

Notes BMW

(1) Other Non-Recurring Items: Asset disposal and write-downs

(2) Non-Operating Non Recurring Items: Unrealized Investment

Analytical Balance Sheet	2014A	2015A	2016A
Working Cash	1.608,0	1.843,5	1.883,3
Accounts Receivable	25.739,0	30.929,0	33.053,0
Inventories	11.089,0	11.071,0	11.841,0
Current Tax Asset	1.906,0	2.381,0	1.938,0
Other Current Assets	5.038,0	4.693,0	5.087,0
Operating Current Assets	**€45.380,0**	**€50.917,5**	**€53.802,3**
Accounts Payables	7.709,0	7.773,0	8.512,0
Current Tax Liability	2.519,0	2.521,0	1.881,0
Deferred Revenue	1.894,0	2.399,0	2.599,0
Other Current Liabilities	9.474,0	10.738,0	12.671,0
Operating Current Liabilities	**€21.596,0**	**€23.431,0**	**€25.663,0**
Operating Working Capital	**€23.784,0**	**€27.486,5**	**€28.139,3**
PP&E	47.347,0	52.724,0	55.749,0
Intangible Assets incl. Goodwill	6.499,0	7.372,0	8.157,0
Investments in JV & Associates	1.088,0	2.233,0	2.546,0
Deferred Tax Asset	2.061,0	1.945,0	2.327,0
Other Non-Current Assets	38.532,0	43.433,0	49.627,0
Total Operating Non-Current Asset	**€95.527,0**	**€107.707,0**	**€118.406,0**
Deferred Revenue	3.594,0	3.855,0	4.657,0
Other Non-Current Liabilities	4.844,0	5.204,0	5.609,0
Deferred Tax Liability	1.974,0	2.116,0	2.795,0
Total Non-Current Operating Liabi	**€10.412,0**	**€11.175,0**	**€13.061,0**
Invested Capital (Net Operating As	**€108.899,0**	**€124.018,5**	**€133.484,3**
Shareholders Equity	37.220,0	42.530,0	47.108,0
Non-Controlling Interest	217,0	234,0	255,0
Total Equity	**€37.437,0**	**€42.764,0**	**€47.363,0**
Liabilities to Credit Institutions (Non-curr	41.954,0	47.171,0	53.730,0
Liabilities to Credit Institutions (Current)	35.552,0	39.962,0	40.670,0
Provisions for Post-Employment Benefits	4.709,0	3.121,0	4.717,0
Derivatives & Hedging Current	1.930,0	2.198,0	1.656,0
Derivatives & Hedging Non-Current	1.213,0	2.352,0	1.675,0
Interest-Bearing Debt	**€85.358,0**	**€94.804,0**	**€102.448,0**
Other Long-Term Investments	2.432,0	2.636,0	3.265,0
Derivatives & Hedging Non-Current	-	-	-
Derivatives & Hedging Current	-	-	-
Short Term Investments	5.384,0	6.635,0	7.065,0
Excess Cash (In Excess of 2% of Sales)	6.080,0	4.278,5	5.996,7
Total Other Financial Assets	**€13.896,0**	**€13.549,5**	**€16.326,7**
Invested Capital (Financing)	**€108.899,0**	**€124.018,5**	**€133.484,3**
Consistency Check	-	-	-
NIBD	**71.462,0**	**81.254,5**	**86.121,3**

Source: Bloomberg. Compiled by the authors

Appendix 6. Renault analytical financial statements

Reported Income Statement	Fiscal Year Ending dec-31			LTM
	2014A	2015A	2016A	2016A
Sales	**€ 41.055,00**	**€ 45.327,00**	**€ 51.243,00**	**€51.243,0**
Cost of Sales	33.310,0	36.113,0	40.256,0	40.256,0
Gross Profit	**€7.745,0**	**€9.214,0**	**€10.987,0**	**€10.987,0**
R&D Expenses	1.721,0	2.075,0	2.370,0	
SG&A	4.415,0	4.819,0	5.335,0	5.335,0
(Income) from Joint Ventures	(1.362,0)	(1.371,0)	(1.638,0)	
Depreciation & Amortization	-	-	-	-
Other Expense - Income	360,0	103,0	(1,0)	(1,0)
EBIT	**€2.611,0**	**€3.588,0**	**€4.921,0**	**€4.921,0**
Financial expenses - income	(21,0)	(70,0)	(62,0)	(62,0)
Interest Expense	498,0	387,0	385,0	385,0
Pre-tax Income	**€2.134,0**	**€3.271,0**	**€4.598,0**	**€4.598,0**
Income Taxes	136,0	311,0	1.055,0	1.055,0
Noncontrolling Interest / Minority Interest	108,0	137,0	124,0	124,0
Preferred Dividends	-	-	-	-
Net Income	**€1.890,0**	**€2.823,0**	**€3.419,0**	**€3.419,0**
Effective Tax Rate	*6,4%*	*9,5%*	*22,9%*	*22,9%*
Adjusted Income Statement				
Reported Gross Profit	€7.745,0	€9.214,0	€10.987,0	€10.987,0
Non-recurring Items in COGS (1)	-	-	-	-
Adj. Gross Profit	**€7.745,0**	**€9.214,0**	**€10.987,0**	**€10.987,0**
% margin	*18,9%*	*20,3%*	*21,4%*	*21,4%*
Reported EBIT	€2.611,0	€3.588,0	€4.921,0	€4.921,0
Non-recurring Items in COGS	-	-	-	-
Other Non-recurring Items net (2)	504,0	186,0	-	-
Adjusted EBIT	**€3.115,0**	**€3.774,0**	**€4.921,0**	**€4.921,0**
% margin	*7,6%*	*8,3%*	*9,6%*	*9,6%*
Depreciation & Amortization	2.711,0	2.728,0	2.840,0	2.840,0
Adjusted EBITDA	**€5.826,0**	**€6.502,0**	**€7.761,0**	**€7.761,0**
% margin	*14,2%*	*14,3%*	*15,1%*	*15,1%*
Reported Net Income	€1.890,0	€2.823,0	€3.419,0	€3.419,0
Non-recurring Items in COGS	-	-	-	-
Other Non-recurring Items	504,0	186,0	-	-
Non-operating Non-rec Items (3)	40,0	93,0	-	-
Tax Adjustment	(128,5)	(65,9)	-	-
Adjusted Net Income	**€2.305,5**	**€3.036,1**	**€3.419,0**	**€3.419,0**
% margin	*5,6%*	*6,7%*	*6,7%*	*6,7%*
Adjusted EBIT	€3.115,0	€3.774,0	€4.921,0	€4.921,0
Corporate Tax	136,0	311,0	1.055,0	€1.055,0
Tax Shield, net Financial Expenses	112,7	74,9	76,3	€76,3
NOPLAT	2.866,3	3.388,1	3.789,7	€3.789,7

Notes Renault

(1) None

(2) One-time charges, provisions related to operations in Iran, restructuring charges and workforce adjustment costs, impairment of fixed assets and gains and losses on disposal of property plant and equipment, and gain or loss on sale of business

(3) Unrealised investments and change in fair value of redeemable shares, gains and losses on total or partial disposal of businesses or operating entities, and other gains

Analytical Balance Sheet	2014A	2015A	2016A
Working Cash	821,1	906,5	1.024,9
Accounts Receivable	26.975,0	29.867,0	36.272,0
Inventories	3.391,0	4.128,0	5.821,0
Current Tax Asset	38,0	62,0	44,0
Other Current Assets	2.305,0	2.654,0	3.612,0
Operating Current Assets	**€33.530,1**	**€37.617,5**	**€46.773,9**
Accounts Payables	7.094,0	8.295,0	9.533,0
Current Tax Liability	2.535,0	2.486,0	321,0
Deferred Revenue	754,0	879,0	-
Other Current Liabilities	5.419,0	5.740,0	10.610,0
Operating Current Liabilities	**€15.802,0**	**€17.400,0**	**€20.464,0**
Operating Working Capital	**€17.728,1**	**€20.217,5**	**€26.309,9**
PP&E	10.801,0	11.171,0	12.988,0
Intangible Assets ind. Goodwill	3.443,0	3.570,0	4.899,0
Investments in JV & Associates	16.790,0	19.401,0	19.026,0
Deferred Tax Asset	716,0	881,0	922,0
Other Non-Current Assets	1.082,0	1.086,0	1.392,0
Total Operating Non-Current Assets	**€32.832,0**	**€36.109,0**	**€39.227,0**
Deferred Revenue	819,0	989,0	-
Other Non-Current Liabilities	1.516,0	1.418,0	2.975,0
Deferred Tax Liability	250,0	178,0	124,0
Total Non-Current Operating Liabilities	**€2.585,0**	**€2.585,0**	**€3.099,0**
Invested Capital (Net Operating Assets)	**€47.975,1**	**€53.741,5**	**€62.437,9**
Shareholders Equity	24.476,0	27.992,0	30.743,0
Non-Controlling Interest	422,0	482,0	152,0
Total Equity	**€24.898,0**	**€28.474,0**	**€30.895,0**
Liabilities to Credit Institutions (Non-current)	7.255,0	5.645,0	4.639,0
Liabilities to Credit Institutions (Current)	28.501,0	34.412,0	41.289,0
Provisions for Post-Employment Benefits	1.683,0	1.550,0	1.717,0
Derivatives & Hedging Current	545,0	477,0	-
Derivatives & Hedging Non-Current	282,0	62,0	-
Interest-Bearing Debt	**€38.266,0**	**€42.146,0**	**€47.645,0**
Other Long-Term Investments	1.372,0	1.403,0	1.366,0
Derivatives & Hedging Non-Current	309,0	75,0	-
Derivatives & Hedging Current	767,0	902,0	-
Short Term Investments	1.065,0	1.272,0	1.908,0
Excess Cash (In Excess of 2% of Sales)	11.675,9	13.226,5	12.828,1
Total Other Financial Assets	**€15.188,9**	**€16.878,5**	**€16.102,1**
Invested Capital (Financing)	**€47.975,1**	**€53.741,5**	**€62.437,9**
Consistency Check	-	-	-
NIBD	**23.077,1**	**25.267,5**	**31.542,9**

Source: Bloomberg. Compiled by the authors

Appendix 7. GM analytical financial statements

Reported Income Statement

	Fiscal Year Ending dec-31			LTM
	2014A	2015A	2016A	2016A
Sales	**€ 117.568,70**	**€ 137.349,90**	**€ 150.400,30**	**€150.400,3**
Cost of Sales	98.532,8	108.920,9	115.917,1	115.917,1
Gross Profit	**€19.035,9**	**€28.429,0**	**€34.483,2**	**€34.483,2**
R&D Expenses	5.579,5	6.761,3	7.322,1	7.322,1
SG&A	9.167,0	12.084,7	10.585,3	10.585,3
(Income) from Joint Ventures	(1.578,9)	(1.977,9)	(2.062,8)	
Depreciation & Amortization	-	-	-	-
Other Expense - Income	3.135,8	5.168,3	7.947,6	7.947,6
EBIT	**€2.732,5**	**€6.392,6**	**€10.691,0**	**€10.691,0**
Financial expenses - income	(772,8)	(964,7)	(387,8)	(387,8)
Interest Expense	303,9	399,4	517,1	517,1
Pre-tax Income	**€3.201,4**	**€6.957,9**	**€10.561,7**	**€10.561,7**
Income Taxes	171,9	(1.710,2)	2.184,0	2.184,0
Noncontrolling Interest / Minority Interest	52,0	(64,9)	(143,7)	(143,7)
Preferred Dividends	863,3	-	-	-
Net Income	**€2.114,2**	**€8.733,0**	**€8.521,4**	**€8.521,4**
Effective Tax Rate	*5,4%*	*(24,6%)*	*20,7%*	*20,7%*

Adjusted Income Statement

Reported Gross Profit	€19.035,9	€28.429,0	€34.483,2	€34.483,2
Non-recurring Items in COGS (1)	-	-	-	-
Adj. Gross Profit	**€19.035,9**	**€28.429,0**	**€34.483,2**	**€34.483,2**
% margin	*16,2%*	*20,7%*	*22,9%*	*22,9%*
Reported EBIT	€2.732,5	€6.392,6	€10.691,0	€10.691,0
Non-recurring Items in COGS	-	-	-	-
Other Non-recurring Items net (2)	4.555,5	4.255,8	773,8	773,8
Adjusted EBIT	**€7.288,0**	**€10.648,4**	**€11.464,8**	**€11.464,8**
% margin	*6,2%*	*7,8%*	*7,6%*	*7,6%*
Depreciation & Amortization	5.457,4	7.224,7	9.408,4	9.408,4
Adjusted EBITDA	**€12.745,4**	**€17.873,1**	**€20.873,2**	**€20.873,2**
% margin	*10,8%*	*13,0%*	*13,9%*	*13,9%*
Reported Net Income	€2.114,2	€8.733,0	€8.521,4	€8.521,4
Non-recurring Items in COGS	-	-	-	-
Other Non-recurring Items	4.555,5	4.255,8	773,8	773,8
Non-operating Non-rec Items (3)	(152,3)	(404,8)	-	-
Tax Adjustment	(1.040,0)	(909,6)	(182,8)	(182,8)
Adjusted Net Income	**€5.477,3**	**€11.674,4**	**€9.112,4**	**€9.112,4**
% margin	*4,7%*	*8,5%*	*6,1%*	*6,1%*
Adjusted EBIT	€7.288,0	€10.648,4	€11.464,8	€11.464,8
Corporate Tax	171,9	(1.710,2)	2.184,0	€2.184,0
Tax Shield, net Financial Expenses	(110,8)	(133,5)	30,5	€30,5
NOPLAT	7.226,8	12.492,2	9.250,2	€9.250,2

Notes GM

(1) None

(2) Litigation Expenses, Ignition switch compensation program, Impairment charges intangible assets and other assets, restructuring charges, Venezuela currency devaluation, flood damage (net of insurance recoveries), recall-related charges, other one-time charges

(3) Early Exstinguishment of Debt

Analytical Balance Sheet

	2014A	2015A	2016A
Working Cash	2.351,4	2.747,0	3.008,0
Accounts Receivable	21.162,0	24.284,9	30.058,8
Inventories	11.274,4	12.667,0	13.072,9
Current Tax Asset	8.066,1	-	-
Other Current Assets	5.324,0	5.388,4	5.604,4
Operating Current Assets	**€48.177,8**	**€45.087,3**	**€51.744,1**
Accounts Payables	41.911,6	47.538,2	53.240,7
Current Tax Liability	-	-	-
Deferred Revenue	-	-	-
Other Current Liabilities	-	-	-
Operating Current Liabilities	**€41.911,6**	**€47.538,2**	**€53.240,7**
Operating Working Capital	**€6.266,2**	**(€2.450,9)**	**(€1.496,6)**
PP&E	22.928,1	28.740,1	33.962,3
Intangible Assets ind. Goodwill	5.297,5	5.473,0	5.934,4
Investments in JV & Associates	6.900,8	8.467,7	8.529,4
Deferred Tax Asset	21.003,3	33.922,3	33.272,0
Other Non-Current Assets	8.224,8	21.344,6	36.594,3
Total Operating Non-Current Assets	**€64.354,5**	**€97.947,7**	**€118.292,4**
Deferred Revenue	-	-	-
Other Non-Current Liabilities	11.638,0	11.644,6	12.401,6
Deferred Tax Liability	-	-	-
Total Non-Current Operating Liabilities	**€11.638,0**	**€11.644,6**	**€12.401,6**
Invested Capital (Net Operating Assets)	**€58.982,8**	**€83.852,3**	**€104.394,2**
Shareholders Equity	29.303,3	36.693,4	41.562,5
Non-Controlling Interest	468,6	416,0	226,6
Total Equity	**€29.771,9**	**€37.109,3**	**€41.789,1**
Liabilities to Credit Institutions (Non-current)	26.215,7	40.078,2	52.716,4
Liabilities to Credit Institutions (Current)	12.350,4	18.002,9	27.522,5
Provisions for Post-Employment Benefits	24.807,4	24.476,3	22.522,0
Derivatives & Hedging Current	-	-	-
Derivatives & Hedging Non-Current	-	-	-
Interest-Bearing Debt	**€63.373,6**	**€82.557,5**	**€102.761,0**
Other Long-Term Investments	13.228,1	17.025,6	19.649,2
Derivatives & Hedging Non-Current	-	-	-
Derivatives & Hedging Current	-	-	-
Short Term Investments	7.621,5	7.512,4	11.226,9
Excess Cash (In Excess of 2% of Sales)	13.313,1	11.276,6	9.279,8
Total Other Financial Assets	**€34.162,7**	**€35.814,6**	**€40.155,9**
Invested Capital (Financing)	**€58.982,8**	**€83.852,3**	**€104.394,2**
Consistency Check	*0,0*	*0,0*	*0,0*
NIBD	**29.210,9**	**46.742,9**	**62.605,0**

Source: Bloomberg. Compiled by the authors

Appendix 8. Ford analytical financial statements

Reported Income Statement	Fiscal Year Ending dec-31			LTM
	2014A	2015A	2016A	2016A
Sales	**€108.632,4**	**€134.827,5**	**€137.220,7**	**€137.220,7**
Cost of Sales	€96.302,5	€118.466,1	€122.475,3	122.475,3
Gross Profit	**€12.329,9**	**€16.361,4**	**€14.745,4**	**€14.745,4**
R&D Expenses	5.051,7	6.040,1	6.598,9	6598,9
SG&A	3.877,0	3.427,5	4.425,8	4.425,8
(Income) from Joint Ventures	(961,3)	(1.638,9)	(1.609,0)	
Depreciation & Amortization	2.335,9	-	-	-
Other Expense - Income	815,1	-	-	-
EBIT	**€1.211,5**	**€8.532,7**	**€5.329,7**	**€5.329,7**
Financial expenses - income	(319,7)	(1.406,4)	(1.621,7)	(1.621,7)
Interest Expense	600,9	696,9	808,1	808,1
Pre-tax Income	**€930,3**	**€9.242,2**	**€6.143,3**	**€6.143,3**
Income Taxes	3,0	2.597,2	1.978,8	1.978,8
Noncontrolling Interest / Minority Interest	(0,8)	(1,8)	9,9	9,9
Preferred Dividends	-	-	-	-
Net Income	**€928,1**	**€6.646,8**	**€4.154,6**	**€4.154,6**
Effective Tax Rate	*0,3%*	*28,1%*	*32,2%*	*32,2%*
Adjusted Income Statement				
Reported Gross Profit	€12.329,9	€16.361,4	€14.745,4	€14.745,4
Non-recurring Items in COGS (1)	-	-	-	-
Adj. Gross Profit	**€12.329,9**	**€16.361,4**	**€14.745,4**	**€14.745,4**
% margin	*11,4%*	*12,1%*	*10,7%*	*10,7%*
Reported EBIT	€1.211,5	€8.532,7	€5.329,7	€5.329,7
Non-recurring Items in COGS	-	-	-	-
Other Non-recurring Items net (2)	4.320,4	629,3	3.235,3	3.235,3
Adjusted EBIT	**€5.531,9**	**€9.161,9**	**€8.565,0**	**€8.565,0**
% margin	*5,1%*	*6,8%*	*6,2%*	*6,2%*
Depreciation & Amortization	5.596,9	7.181,4	7.879,8	7.879,8
Adjusted EBITDA	**€11.128,8**	**€16.343,4**	**€16.444,8**	**€16.444,8**
% margin	*10,2%*	*12,1%*	*12,0%*	*12,0%*
Reported Net Income	€928,1	€6.646,8	€4.154,6	€4.154,6
Non-recurring Items in COGS	-	-	-	-
Other Non-recurring Items	4.320,4	629,3	3.235,3	3.235,3
Non-operating Non-rec Items (3)	955,6	(80,3)	(117,6)	(117,6)
Tax Adjustment	(1.246,2)	(129,7)	(736,4)	(736,4)
Adjusted Net Income	**€4.957,9**	**€7.066,1**	**€6.535,9**	**€6.535,9**
% margin	*4,6%*	*5,2%*	*4,8%*	*4,8%*
Adjusted EBIT	€5.531,9	€9.161,9	€8.565,0	€8.565,0
Corporate Tax	3,0	2.597,2	1.978,8	€1.978,8
Tax Shield, net Financial Expenses	66,4	(167,6)	(192,2)	(€192,2)
NOPLAT	5.462,4	6.732,3	6.778,3	€6.778,3

Notes

(1)

(2) Venezuelan accounting change, Personnel and dealer-related items, Re-measurement losses on pensions and restructuring costs

(3) Early Exstinguishment of Debt, Sale of stake in RRPHS and Tesla, and proceeds generated for Daimler

Analytical Balance Sheet	2014A	2015A	2016A
Working Cash	2.172,6	2.696,6	2.744,4
Accounts Receivable	4.784,3	51.701,6	54.392,7
Inventories	6.504,1	7.656,0	8.436,5
Current Tax Asset	1.694,2	-	-
Other Current Assets	1.113,2	2.680,8	3.193,3
Operating Current Assets	**€16.268,5**	**€64.735,0**	**€68.767,0**
Accounts Payables	31.069,4	2.217,9	19.942,2
Current Tax Liability	223,1	-	-
Deferred Revenue	-	-	-
Other Current Liabilities	-	17.567,6	18.314,2
Operating Current Liabilities	**€31.292,6**	**€19.785,6**	**€38.256,4**
Operating Working Capital	**(€15.024,0)**	**€44.949,4**	**€30.510,6**
PP&E	24.624,0	27.759,1	30.408,6
Intangible Assets ind. Goodwill	109,9	114,1	187,7
Investments in JV & Associates	2.774,4	2.967,1	3.132,6
Deferred Tax Asset	11.326,4	10.591,8	9.201,7
Other Non-Current Assets	74.993,4	44.517,8	51.072,3
Total Operating Non-Current Assets	**€113.828,1**	**€85.949,8**	**€94.003,0**
Deferred Revenue	2.219,8	3.023,2	3.495,8
Other Non-Current Liabilities	5.552,1	4.862,9	4.377,5
Deferred Tax Liability	1.831,4	462,0	655,2
Total Non-Current Operating Liabilities	**€9.603,3**	**€8.348,1**	**€8.528,5**
Invested Capital (Net Operating Assets)	**€89.200,7**	**€122.551,1**	**€115.985,1**
Shareholders Equity	20.196,7	26.359,3	27.657,2
Non-Controlling Interest	305,0	100,3	107,1
Total Equity	**€20.501,7**	**€26.459,6**	**€27.764,3**
Liabilities to Credit Institutions (Non-current)	66.114,9	82.715,8	88.462,1
Liabilities to Credit Institutions (Current)	32.373,6	39.550,0	47.093,0
Provisions for Post-Employment Benefits	13.379,3	13.701,5	14.853,5
Derivatives & Hedging Current	727,3	16.438,4	249,4
Derivatives & Hedging Non-Current	-	-	403,0
Interest-Bearing Debt	**€112.595,0**	**€152.405,7**	**€151.061,0**
Other Long-Term Investments	17.783,5	24.933,7	27.333,8
Derivatives & Hedging Non-Current	1.137,2	1.704,4	1.437,4
Derivatives & Hedging Current	-	-	-
Short Term Investments	18.257,9	19.238,0	21.733,2
Excess Cash (In Excess of 2% of Sales)	6.717,4	10.438,0	12.335,7
Total Other Financial Assets	**€43.895,9**	**€56.314,1**	**€62.840,1**
Invested Capital (Financing)	**€89.200,7**	**€122.551,1**	**€115.985,1**
Consistency Check	-	-	-
NIBD	**68.699,1**	**96.091,5**	**88.220,9**

Source: Bloomberg. Compiled by the authors

Appendix 9. Mazda analytical financial statements

Reported Income Statement	Fiscal Year Ending march-31			LTM
	2014A	2015A	2016A	2016LTM
Sales	**€ 20.067,30**	**€ 21.886,00**	**€ 25.722,50**	**€ 26.716,20**
Cost of Sales	14.860,1	16.214,7	19.386,4	20.191,3
Gross Profit	**€5.207,2**	**€5.671,3**	**€6.336,1**	**€6.524,9**
R&D Expenses	740,6	781,8	842,7	1.032,6
SG&A	3.109,0	3.425,9	3.781,2	4.198,2
(Income) from Joint Ventures		-		
Depreciation & Amortization	-	-	-	-
Other Expense - Income	-	-	-	-
EBIT	**€1.357,6**	**€1.463,6**	**€1.712,2**	**€1.294,1**
Financial expenses - income	527,5	(153,3)	340,7	283,1
Interest Expense	104,0	106,7	110,8	84,4
Pre-tax Income	**€726,1**	**€1.510,2**	**€1.260,7**	**€926,6**
Income Taxes	269,0	343,9	224,1	140,1
Noncontrolling Interest / Minority Interest	16,4	20,6	21,8	29,3
Preferred Dividends	-	-	-	-
Net Income	**€440,7**	**€1.145,7**	**€1.014,8**	**€757,2**
Effective Tax Rate	*37,0%*	*22,8%*	*17,8%*	*15,1%*
Adjusted Income Statement				
Reported Gross Profit	€5.207,2	€5.671,3	€6.336,1	€6.524,9
Non-recurring Items in COGS (1)	-	-	-	-
Adj. Gross Profit	**€5.207,2**	**€5.671,3**	**€6.336,1**	**€6.524,9**
% margin	*25,9%*	*25,9%*	*24,6%*	*24,4%*
Reported EBIT	€1.357,6	€1.463,6	€1.712,2	€1.294,1
Non-recurring Items in COGS	-	-	-	-
Other Non-recurring Items net (2)	52,0	58,8	53,1	83,9
Adjusted EBIT	**€1.409,6**	**€1.522,4**	**€1.765,3**	**€1.378,0**
% margin	*7,0%*	*7,0%*	*6,9%*	*5,2%*
Depreciation & Amortization	429,8	496,8	596,3	669,9
Adjusted EBITDA	**€1.839,4**	**€2.019,2**	**€2.361,6**	**€2.047,9**
% margin	*9,2%*	*9,2%*	*9,2%*	*7,7%*
Reported Net Income	€440,7	€1.145,7	€1.014,8	€757,2
Non-recurring Items in COGS	-	-	-	-
Other Non-recurring Items	52,0	58,8	53,1	83,9
Non-operating Non-rec. Items (3)	(0,9)	(0,3)	(1,6)	
Tax Adjustment	(12,1)	(13,8)	(12,2)	(19,8)
Adjusted Net Income	**€479,7**	**€1.190,4**	**€1.054,1**	**€821,3**
% margin	*2,4%*	*5,4%*	*4,1%*	*3,1%*
Adjusted EBIT	€1.409,6	€1.522,4	€1.765,3	€1.378,0
Corporate Tax	269,0	343,9	224,1	€140,1
Tax Shield, net Financial Expenses	149,2	(11,0)	106,6	86,8
NOPLAT	991,4	1.189,5	1.434,6	1.151,1

Notes Mazda

(1)

(2) Other Non-Recurring Items: Asset disposal, Asset write-down and impairment of intangibles

(3) Non-Operating Non Recurring Items: Sale of Investment and other abnormal items

Analytical Balance Sheet	2014A	2015A	2016A
Working Cash	401,3	437,7	514,5
Accounts Receivable	1.265,9	1.666,1	1.548,1
Inventories	2.280,3	2.949,1	2.995,4
Current Tax Asset	386,7	596,5	825,2
Other Current Assets	657,7	889,7	839,4
Operating Current Assets	**€4.992,0**	**€6.539,1**	**€6.722,5**
Accounts Payables	3.705,1	4.618,9	4.520,6
Current Tax Liability	24,5	127,4	248,2
Deferred Revenue	-	-	-
Other Current Liabilities	476,7	625,4	1.059,9
Operating Current Liabilities	**€4.206,3**	**€5.371,8**	**€5.828,7**
Operating Working Capital	**€785,7**	**€1.167,4**	**€893,8**
PP&E	6.100,5	7.325,5	7.320,5
Intangible Assets ind. Goodwill	160,8	228,2	240,1
Investments in JV & Associates	964,4	921,8	944,5
Deferred Tax Asset	381,8	200,4	173,8
Other Non-Current Assets	156,3	205,7	219,6
Total Operating Non-Current Assets	**€7.763,7**	**€8.881,4**	**€8.898,5**
Deferred Revenue	11,2	-	-
Other Non-Current Liabilities	1.396,3	1.293,0	950,3
Deferred Tax Liability	-	-	-
Total Non-Current Operating Liabilities	**€1.407,5**	**€1.293,0**	**€950,3**
Invested Capital (Net Operating Assets)	**€7.142,0**	**€8.755,8**	**€8.842,0**
Shareholders Equity	4.654,7	6.757,7	7.451,1
Non-Controlling Interest	113,5	168,9	177,3
Total Equity	**€4.768,2**	**€6.926,6**	**€7.628,5**
Liabilities to Credit Institutions (Non-current)	3.432,2	3.479,6	2.787,8
Liabilities to Credit Institutions (Current)	1.514,6	1.656,6	2.032,1
Provisions for Post-Employment Benefits	494,2	487,0	672,8
Derivatives & Hedging Current	-	-	-
Derivatives & Hedging Non-Current	-	-	-
Interest-Bearing Debt	**€5.441,0**	**€5.623,2**	**€5.492,8**
Other Long-Term Investments	80,7	118,5	116,5
Derivatives & Hedging Non-Current	-	-	-
Derivatives & Hedging Current	-	-	-
Short Term Investments	1.076,0	1.176,3	1.102,8
Excess Cash (In Excess of 2% of Sales)	1.910,4	2.499,1	3.060,0
Total Other Financial Assets	**€3.067,2**	**€3.793,9**	**€4.279,2**
Invested Capital (Financing)	**€7.142,0**	**€8.755,8**	**€8.842,0**
Consistency Check	-	-	-
NIBD	**2.373,8**	**1.829,3**	**1.213,5**

Source: Bloomberg. Compiled by the authors

Appendix 10. Fiat Chrysler analytical financial statements

Reported Income Statement

	Fiscal Year Ending dec-31			LTM
	2014A	2015A	2016A	2016A
Sales	**€ 93.640,00**	**€ 110.595,00**	**€ 111.018,00**	**€111.018,0**
Cost of Sales	81.592,0	97.620,0	95.295,0	95.295,0
Gross Profit	**€12.048,0**	**€12.975,0**	**€15.723,0**	**€15.723,0**
R&D Expenses	2.334,0	2.864,0	3.274,0	3.274,0
SG&A	6.947,0	7.728,0	7.568,0	7.568,0
(Income) from Joint Ventures	(169,0)	(157,0)	(226,0)	
Depreciation & Amortization	-	-	-	-
Other Expense - Income	(67,0)	(242,0)	(241,0)	(241,0)
EBIT	**€3.003,0**	**€2.782,0**	**€5.348,0**	**€5.348,0**
Financial expenses - income	590,0	800,0	1.021,0	1.021,0
Interest Expense	1.630,0	1.723,0	1.221,0	1.221,0
Pre-tax Income	**€783,0**	**€259,0**	**€3.106,0**	**€3.106,0**
Income Taxes	424,0	166,0	1.292,0	1.292,0
Noncontrolling Interest / Minority Interest	64,0	43,0	11,0	11,0
Discontinued Operations	(273,0)	(284,0)	-	-
Net Income	**€568,0**	**€334,0**	**€1.803,0**	**€1.803,0**
Effective Tax Rate	*54,2%*	*64,1%*	*41,6%*	*41,6%*

Adjusted Income Statement

Reported Gross Profit	€12.048,0	€12.975,0	€15.723,0	€15.723,0
Non-recurring Items in COGS (1)	131,0	1.372,0	590,0	590,0
Adj. Gross Profit	**€12.179,0**	**€14.347,0**	**€16.313,0**	**€16.313,0**
% margin	*13,0%*	*13,0%*	*14,7%*	*14,7%*
Reported EBIT	€3.003,0	€2.782,0	€5.348,0	€5.348,0
Non-recurring Items in COGS	131,0	1.372,0	590,0	590,0
Other Non-recurring Items net (2)	236,0	531,6	288,0	288,0
Adjusted EBIT	**€3.370,0**	**€4.685,6**	**€6.226,0**	**€6.226,0**
% margin	*3,6%*	*4,2%*	*5,6%*	*5,6%*
Depreciation & Amortization	4.607,0	5.414,0	5.956,0	5.956,0
Adjusted EBITDA	**€7.977,0**	**€10.099,6**	**€12.182,0**	**€12.182,0**
% margin	*8,5%*	*9,1%*	*11,0%*	*11,0%*
Reported Net Income	€568,0	€334,0	€1.803,0	€1.803,0
Non-recurring Items in COGS	131,0	1.372,0	590,0	590,0
Other Non-recurring Items	236,0	531,6	288,0	288,0
Non-operating Non-rec Items (3)	249,0	400,0	312,0	312,0
Tax Adjustment	(145,5)	(544,1)	(281,1)	(281,1)
Adjusted Net Income	**€1.038,5**	**€2.093,5**	**€2.711,9**	**€2.711,9**
% margin	*1,1%*	*1,9%*	*2,4%*	*2,4%*
Adjusted EBIT	€3.370,0	€4.685,6	€6.226,0	€6.226,0
Corporate Tax	424,0	166,0	1.292,0	€1.292,0
Tax Shield, net Financial Expenses	524,4	595,9	529,6	€529,6
NOPLAT	2.421,6	3.923,7	4.404,4	€4.404,4

Notes Fiat Chrysler

(1) Non-recurring Items in COGS: Currency devaluation, impairment of assets and write-downs

(2) Other Non-recurring Items: Disposal of assets, restructurng, legal settlement, asset write-down

(3) Non-operating non-recurring items: Sale of investments, unrealized investments, early extinguishment of debt

Analytical Balance Sheet

	2014A	2015A	2016A
Working Cash	1.872,8	2.211,9	2.220,4
Accounts Receivable	7.653,0	4.674,0	5.057,0
Inventories	10.449,0	11.351,0	12.121,0
Current Tax Asset	284,0	307,0	206,0
Other Current Assets	2.937,0	8.229,0	4.442,0
Operating Current Assets	**€23.195,8**	**€26.772,9**	**€24.046,4**
Accounts Payables	19.854,0	21.465,0	22.655,0
Current Tax Liability	296,0	241,0	162,0
Deferred Revenue	-	-	-
Other Current Liabilities	15.525,0	20.530,0	18.715,0
Operating Current Liabilities	**€35.675,0**	**€42.236,0**	**€41.532,0**
Operating Working Capital	**(€12.479,2)**	**(€15.463,1)**	**(€17.485,6)**
PP&E	26.408,0	27.454,0	30.431,0
Intangible Assets ind. Goodwill	22.847,0	24.736,0	26.644,0
Investments in JV & Associates	1.471,0	1.658,0	1.793,0
Deferred Tax Asset	4.186,0	4.056,0	3.699,0
Other Non-Current Assets	1.364,0	1.084,0	1.405,0
Total Operating Non-Current Assets	**€56.276,0**	**€58.988,0**	**€63.972,0**
Deferred Revenue	-	-	-
Other Non-Current Liabilities	8.236,0	8.682,0	9.742,0
Deferred Tax Liability	233,0	156,0	194,0
Total Non-Current Operating Liabilities	**€8.469,0**	**€8.838,0**	**€9.936,0**
Invested Capital (Net Operating Assets)	**€35.327,8**	**€34.686,9**	**€36.550,4**
Shareholders Equity	14.064,0	16.805,0	19.168,0
Non-Controlling Interest	313,0	163,0	185,0
Total Equity	**€14.377,0**	**€16.968,0**	**€19.353,0**
Liabilities to Credit Institutions (Non-current)	26.014,0	20.418,0	16.111,0
Liabilities to Credit Institutions (Current)	7.710,0	7.368,0	7.937,0
Provisions for Post-Employment Benefits	8.904,0	9.406,0	9.052,0
Derivatives & Hedging Current	-	-	-
Derivatives & Hedging Non-Current	-	519,0	422,0
Interest-Bearing Debt	**€42.628,0**	**€37.711,0**	**€33.522,0**
Other Long-Term Investments	700,0	724,0	649,0
Derivatives & Hedging Non-Current	-	-	-
Derivatives & Hedging Current	10,0	818,0	578,0
Short Term Investments	-	-	-
Excess Cash (In Excess of 2% of Sales)	20.967,2	18.450,1	15.097,6
Total Other Financial Assets	**€21.677,2**	**€19.992,1**	**€16.324,6**
Invested Capital (Financing)	**€35.327,8**	**€34.686,9**	**€36.550,4**
Consistency Check	-	-	-
NIBD	**20.950,8**	**17.718,9**	**17.197,4**

Source: Bloomberg. Compiled by the authors

Appendix 11. Profit margin break-down: Common size and indexed values

Profit Margin Break-Down: Common Size of Key Analytical Income Statement Components

	Cost of Sales			Gross Profit			SG&A			R&D Expenses		
	2014	*2015*	*2016*	*2014*	*2015*	*2016*	*2014*	*2015*	*2016*	*2014*	*2015*	*2016*
Volvo	-79,9%	-74,9%	-76%	20,1%	25,1%	24%	-10,3%	-10,8%	-10%	-3,2%	-3,2%	-2,9%
BMW	-73,2%	-74,7%	-76,9%	26,8%	25,3%	23,1%	-9,8%	-9,4%	-9,7%	-5,7%	-5,6%	-3,3%
Renault	-81,1%	-79,7%	-78,6%	18,9%	20,3%	21,4%	-10,8%	-10,6%	-10,4%	-4,2%	-4,6%	-4,6%
GM	-83,8%	-79,3%	-77,1%	16,2%	20,7%	22,9%	-7,8%	-8,8%	-7,0%	-4,7%	-4,9%	-4,9%
Ford	-88,6%	-87,9%	-89,3%	11,4%	12,1%	10,7%	-3,6%	-2,5%	-3,2%	-4,7%	-4,5%	-4,8%
Fiat Chrysler	-87,0%	-87,0%	-85,3%	13,0%	13,0%	14,7%	-7,4%	-7,0%	-6,8%	-2,5%	-2,6%	-2,9%
Mazda	-74,1%	-74,1%	-75,4%	25,9%	25,9%	24,6%	-15,5%	-15,7%	-14,7%	-3,7%	-3,6%	-3,3%
Peer Average	**-81,3%**	**-80,4%**	**-80,4%**	**18,7%**	**19,6%**	**19,6%**	**-9,1%**	**-9,0%**	**-8,7%**	**-4,2%**	**-4,3%**	**-4,0%**

	Other Operating Expenses, Net			EBITDA			D&A			EBIT		
	2014	*2015*	*2016*	*2014*	*2015*	*2016*	*2014*	*2015*	*2016*	*2014*	*2015*	*2016*
Volvo	0,3%	-1,3%	1%	7,67%	9,78%	11,92%	-5,4%	-5,7%	-6%	2,3%	4,1%	6,1%
BMW	0,0%	0,2%	-0,1%	17,5%	15,9%	15,7%	-5,4%	-5,1%	-5,3%	12,2%	10,8%	10,3%
Renault	0,4%	0,2%	0,0%	14,2%	14,3%	15,1%	-6,6%	-6,0%	-5,5%	7,6%	8,3%	9,6%
GM	1,2%	-0,7%	-4,8%	10,8%	13,0%	13,9%	-4,6%	-5,3%	-6,3%	6,2%	7,8%	7,6%
Ford	-1,2%	0,0%	0,0%	10,2%	12,1%	12,0%	-5,2%	-5,3%	-5,7%	5,1%	6,8%	6,2%
Fiat Chrysler	0,3%	0,7%	0,5%	8,5%	9,1%	11,0%	-4,9%	-4,9%	-5,4%	3,6%	4,2%	5,6%
Mazda	0,3%	0,3%	0,2%	9,2%	9,2%	9,2%	-2,1%	-2,3%	-2,3%	7,0%	7,0%	6,9%
Peer Average	**0,2%**	**0,1%**	**-0,7%**	**11,7%**	**12,3%**	**12,8%**	**-4,8%**	**-4,8%**	**-5,1%**	**6,9%**	**7,5%**	**7,7%**

Profit Margin Break-Down: Indexation of Key Analytical Income Statement Components

	Revenue			Gross Profit			EBITDA			EBIT		
Year	*2014*	*2015*	*2016*	*2014*	*2015*	*2016*	*2014*	*2015*	*2016*	*2014*	*2015*	*2016*
Volvo	100	119,2	131,3	100	148,7	156,7	100	152,0	204,0	100	208	345
BMW	100	114,6	117,1	100	108,0	101,0	100	104,1	104,6	100	103	100
Renault	100	110,4	124,8	100	119,0	141,9	100	111,6	133,2	100	121	158
GM	100	116,8	127,9	100	149,3	181,1	100	140,2	163,8	100	146	157
Ford	100	124,1	126,3	100	132,7	119,6	100	146,9	147,8	100	166	155
Fiat Chrysler	100	118,1	118,6	100	117,8	133,9	100	126,6	152,7	100	139	185
Mazda	100	109,1	128,2	100	108,9	121,7	100	109,8	128,4	100	108	125
Average:	**100**	**115,5**	**123,8**	**100**	**122,6**	**133,2**	**100**	**123,2**	**138,4**	**100**	**130,5**	**146,7**
2 Year CAGR Peers			11,3%			15,4%			17,6%			21,1%
2 Year CAGR Volvo			14,6%			25,2%			42,8%			85,6%

	Cost of Sales			SG&A			R&D Expense			D&A		
Year	*2014*	*2015*	*2016*	*2014*	*2015*	*2016*	*2014*	*2015*	*2016*	*2014*	*2015*	*2016*
Volvo	100	111,8	124,9	100	125,3	126,9	100	117	120	100	127,7	143,0
BMW	100	117,1	123,0	100	109,4	116,0	100	113	67	100	108,4	115,6
Renault	100	108,4	120,9	100	109,2	120,8	100	121	138	100	100,6	104,8
GM	100	110,5	117,6	100	131,8	115,5	100	121	131	100	132,4	172,4
Ford	100	123,0	127,2	100	88,4	114,2	100	120	131	100	128,3	140,8
Fiat Chrysler	100	119,6	116,8	100	111,2	108,9	100	123	140	100	117,5	129,3
Mazda	100	109,1	130,5	100	110,2	121,6	100	106	114	100	115,6	138,7
Average:		**114,6**	**122,7**		**110,0**	**116,2**		**117,1**	**120,2**		**117,1**	**133,6**

Source: Compiled by the authors using company filings

Appendix 12. Invested Capital Break-Down: Common size and days on hand

Invested Capital Break-Down: Common Size Operating Working Capital

	Accounts Receivable (CA)			Inventories (CA)			Current Tax Asset (CA)		
	2014	*2015*	*2016*	*2014*	*2015*	*2016*	*2014*	*2015*	*2016*
Volvo	5,6%	5,4%	4,8%	12,9%	12,4%	11,7%	0,3%	0,2%	0,2%
BMW	32,0%	33,6%	35,1%	13,8%	12,0%	12,6%	2,4%	2,6%	2,1%
Renault	65,7%	65,9%	70,8%	8,3%	9,1%	11,4%	0,1%	0,1%	0,1%
GM	18,0%	17,7%	20,0%	9,6%	9,2%	8,7%	6,9%	0,0%	0,0%
Ford	4,4%	38,3%	39,6%	6,0%	5,7%	6,1%	1,6%	0,0%	0,0%
Fiat Chrysler	8,2%	4,2%	4,6%	11,2%	10,3%	10,9%	0,3%	0,3%	0,2%
Mazda	6,3%	7,6%	6,0%	11,4%	13,5%	11,6%	1,9%	2,7%	3,2%
Peer Average	**22,4%**	**27,9%**	**29,3%**	**10,0%**	**10,0%**	**10,2%**	**2,2%**	**1,0%**	**0,9%**

	Other Current Assets (CA)			Accounts Payables (CL)			Current Tax Liability (CL)		
	2014	*2015*	*2016*	*2014*	*2015*	*2016*	*2014*	*2015*	*2016*
Volvo	3,4%	2,6%	3,2%	-13,5%	-16,0%	-16,9%	-0,5%	-0,3%	-0,3%
BMW	6,3%	5,1%	5,4%	-9,6%	-8,4%	-9,0%	-3,1%	-2,7%	-2,0%
Renault	5,6%	5,9%	7,0%	-17,3%	-18,3%	-18,6%	-6,2%	-5,5%	-0,6%
GM	4,5%	3,9%	3,7%	-35,6%	-34,6%	-35,4%	0,0%	0,0%	0,0%
Ford	1,0%	2,0%	2,3%	-28,6%	-1,6%	-14,5%	-0,2%	0,0%	0,0%
Fiat Chrysler	3,1%	7,4%	4,0%	-21,2%	-19,4%	-20,4%	-0,3%	-0,2%	-0,1%
Mazda	3,3%	4,1%	3,3%	-18,5%	-21,1%	-17,6%	-0,1%	-0,6%	-1,0%
Peer Average	**4,0%**	**4,7%**	**4,3%**	**-21,8%**	**-17,3%**	**-19,3%**	**-1,7%**	**-1,5%**	**-0,6%**

	Deferred Revenue (CL)			Other Current Liabilities (CL)			Current Provisions (CL)		
	2014	*2015*	*2016*	*2014*	*2015*	*2016*	*2014*	*2015*	*2016*
Volvo	-0,3%	-0,3%	-0,4%	-13,9%	-12,7%	-14,5%	-7,62%	-7,59%	-8,51%
BMW	-2,4%	-2,6%	-2,8%	-11,8%	-11,6%	-13,5%			
Renault	-1,8%	-1,9%	0,0%	-13,2%	-12,7%	-20,7%			
GM	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%			
Ford	0,0%	0,0%	0,0%	0,0%	-13,0%	-13,3%			
Fiat Chrysler	0,0%	0,0%	0,0%	-16,6%	-18,6%	-16,9%			
Mazda	0,0%	0,0%	0,0%	-2,4%	-2,9%	-4,1%			
Peer Average	**-0,7%**	**-0,8%**	**-0,5%**	**-7,3%**	**-9,8%**	**-11,4%**			

	Operating Current Assets			Operating Current Liabilities			Operating Working Capital		
	2014	*2015*	*2016*	*2014*	*2015*	*2016*	*2014*	*2015*	*2016*
Volvo	24,1%	22,6%	21,9%	-35,7%	-36,9%	-40,6%	-11,6%	-14,4%	-18,7%
BMW	56,4%	55,2%	57,1%	-26,9%	-25,4%	-27,3%	29,6%	29,8%	29,9%
Renault	81,7%	83,0%	91,3%	-38,5%	-38,4%	-39,9%	43,2%	44,6%	51,3%
GM	41,0%	32,8%	34,4%	-35,6%	-34,6%	-35,4%	5,3%	-1,8%	-1,0%
Ford	15,0%	48,0%	50,1%	-28,8%	-14,7%	-27,9%	-13,8%	33,3%	22,2%
Fiat Chrysler	24,8%	24,2%	21,7%	-38,1%	-38,2%	-37,4%	-13,3%	-14,0%	-15,8%
Mazda	24,9%	29,9%	26,1%	-21,0%	-24,5%	-22,7%	3,9%	5,3%	3,5%
Peer Average	**40,6%**	**45,5%**	**46,8%**	**-31,5%**	**-29,3%**	**-31,8%**	**9,1%**	**16,2%**	**15,0%**

Source: Compiled by the authors using company filings

Invested Capital Break-Down: Common Size Non-Current Operating Assets & Liabilities

	PP&E (A)			Intangible Assets incl. Goodwill (A)			Investments in JV & Associates (A)		
	2014	2015	2016	2014	2015	2016	2014	2015	2016
Volvo	27,7%	24,1%	26,5%	15,0%	13,9%	14,0%	0,4%	0,4%	1,4%
BMW	59%	57%	59,2%	8,1%	8,0%	8,7%	1,4%	2,4%	2,7%
Renault	26,3%	24,6%	25,3%	8,4%	7,9%	9,6%	40,9%	42,8%	37,1%
GM	19,5%	20,9%	22,6%	4,5%	4,0%	3,9%	5,9%	6,2%	5,7%
Ford	22,7%	20,6%	22,2%	0,1%	0,1%	0,1%	2,6%	2,2%	2,3%
Fiat Chrysler	28,2%	24,8%	27,4%	24,4%	22,4%	24,0%	1,6%	1,5%	1,6%
Mazda	30,4%	33,5%	28,5%	0,8%	1,0%	0,9%	4,8%	4,2%	3,7%
Peer Average	**30,5%**	**29,4%**	**30,2%**	**8,8%**	**8,2%**	**8,8%**	**8,2%**	**8,5%**	**7,8%**

	Deferred Tax Asset (A)			Other Non-Current Assets (A)		
	2014	*2015*	*2016*	*2014*	*2015*	*2016*
Volvo	2,3%	2,3%	2,3%	8,3%	0,3%	1,1%
BMW	2,6%	2,1%	2,5%	47,9%	47,1%	52,7%
Renault	1,7%	1,9%	1,8%	2,6%	2,4%	2,7%
GM	17,9%	24,7%	22,1%	7,0%	15,5%	24,3%
Ford	10,4%	7,9%	6,7%	69,0%	33,0%	37,2%
Fiat Chrysler	4,5%	3,7%	3,3%	1,5%	1,0%	1,3%
Mazda	1,9%	0,9%	0,7%	0,8%	0,9%	0,9%
Peer Average	**6,5%**	**6,9%**	**6,2%**	**21,5%**	**16,7%**	**19,8%**

	Deferred Revenue (L)			Other Non-Current Liabilities (L)			Deferred Tax Liability (L)		
	2014	*2015*	*2016*	*2014*	*2015*	*2016*	*2014*	*2015*	*2016*
Volvo	-4,3%	-3,6%	-3,9%	-1,2%	-1,7%	-3,2%	-2,4%	-1,1%	-0,7%
BMW	-4,5%	-4,2%	-4,9%	-6,0%	-5,6%	-6,0%	-2,5%	-2,3%	-3,0%
Renault	-2,0%	-2,2%	0,0%	-3,7%	-3,1%	-5,8%	-0,6%	-0,4%	-0,2%
GM	0,0%	0,0%	0,0%	-9,9%	-8,5%	-8,2%	0,0%	0,0%	0,0%
Ford	-2,0%	-2,2%	-2,5%	-5,1%	-3,6%	-3,2%	-1,7%	-0,3%	-0,5%
Fiat Chrysler	0,0%	0,0%	0,0%	-8,8%	-7,9%	-8,8%	-0,2%	-0,1%	-0,2%
Mazda	-0,1%	0,0%	0,0%	-7,0%	-5,9%	-3,7%	0,0%	0,0%	0,0%
Peer Average	**-1%**	**-1,4%**	**-1,2%**	**-6,7%**	**-5,8%**	**-5,9%**	**-0,8%**	**-0,5%**	**-0,6%**

	Total Operating Non-Current Assets			Total Non-Current Operating Liabilities		
	2014	*2015*	*2016*	*2014*	*2015*	*2016*
Volvo	53,7%	41,2%	45,4%	-7,8%	-6,4%	-7,8%
BMW	118,8%	116,9%	125,7%	-13,0%	-12,1%	-13,9%
Renault	80,0%	79,7%	76,6%	-6,3%	-5,7%	-6,0%
GM	54,7%	71,3%	78,7%	-9,9%	-8,5%	-8,2%
Ford	104,8%	63,7%	68,5%	-8,8%	-6,2%	-6,2%
Fiat Chrysler	60,1%	53,3%	57,6%	-9,0%	-8,0%	-8,9%
Mazda	38,7%	40,6%	34,6%	-7,0%	-5,9%	-3,7%
Peer Average	**76,2%**	**70,9%**	**73,6%**	**-9,0%**	**-7,7%**	**-7,8%**

Source: Compiled by the authors using company filings

Invested Capital Break-Down: Days on Hand Current Items

	Accounts Receivable (CA)			Inventories (CA)		
	2014	*2015*	*2016*	*2014*	*2015*	*2016*
Volvo	20	19	17	58	59	56
BMW	115	121	126	68	58	59
Renault	237	237	255	37	41	52
GM	65	64	72	41	42	41
Ford	16	138	143	24	23	25
Fiat Chrysler	29	15	16	46	42	46
Mazda	23	27	22	55	65	56
Peer Average	**80,76**	**100,39**	**105,65**	**45,23**	**45,25**	**46,29**

	Accounts Payables (CL)			Other Current Liabilities (CL)		
	2014	*2015*	*2016*	*2014*	*2015*	*2016*
Volvo	61	77	80	-50	-46	-52
BMW	47	41	42	-42	-42	-48
Renault	77	83	85	-48	-46	-75
GM	153	157	165	0	0	0
Ford	116	7	59	0	-47	-48
Fiat Chrysler	88	79	86	-60	-67	-61
Mazda	90	103	84	-9	-10	-15
Peer Average	**95,08**	**78,15**	**86,85**	**(26,36)**	**(35,26)**	**(41,09)**

	Operating Current Assets			Operating Current Liabilities			Operating Working Capital		
	2014	*2015*	*2016*	*2014*	*2015*	*2016*	*2014*	*2015*	*2016*
Volvo	87	81	79	-128	-133	-146	-42	-52	-67
BMW	203	199	206	-97	-92	-98	106	107	108
Renault	294	299	329	-139	-138	-144	155	161	185
GM	148	118	124	-128	-125	-127	19	-6	-4
Ford	54	173	180	-104	-53	-100	-50	120	80
Fiat Chrysler	89	87	78	-137	-137	-135	-48	-50	-57
Mazda	90	108	94	-75	-88	-82	14	19	13
Peer Average	**146,23**	**163,89**	**168,44**	**(113,32)**	**(105,50)**	**(114,32)**	**32,91**	**58,40**	**54,11**

Invested Capital Break-Down: Days on Hand Non-Current Items

	PP&E (A)			Intangible Assets incl. Goodwill (A)		
	2014	*2015*	*2016*	*2014*	*2015*	*2016*
Volvo	100	87	96	54	50	51
BMW	212	206	213	29	29	31
Renault	95	89	91	30	28	34
GM	70	75	81	16	14	14
Ford	82	74	80	0	0	0
Fiat Chrysler	102	89	99	88	81	86
Mazda	109	120	102	3	4	3
Peer Average	**111,58**	**108,99**	**111,10**	**27,77**	**26,01**	**28,34**

	Total Operating Non-Current Assets (A)			Total Non-Current Operating Liabilities		
	2014	*2015*	*2016*	*2014*	*2015*	*2016*
Volvo	193	148	163	-28	-23	-28
BMW	428	421	453	-47	-44	-50
Renault	288	287	276	-23	-21	-22
GM	197	257	283	-36	-31	-30
Ford	377	229	247	-32	-22	-22
Fiat Chrysler	216	192	207	-33	-29	-32
Mazda	139	146	125	-25	-21	-13
Peer Average	**274,25**	**255,30**	**265,00**	**(32,43)**	**(27,84)**	**(28,21)**

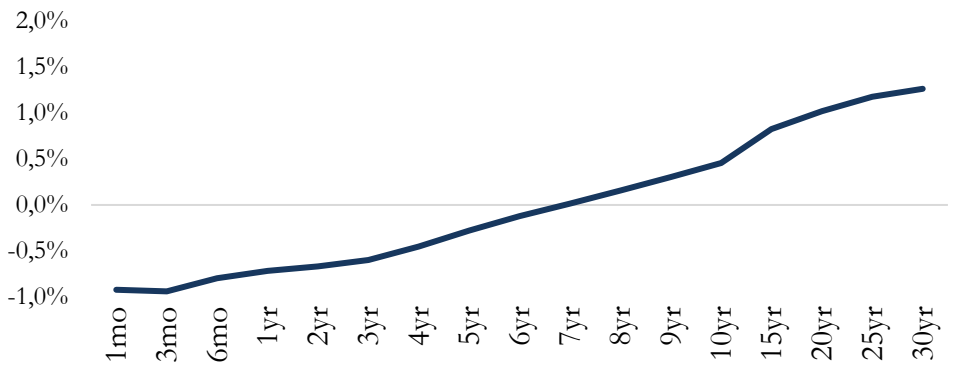
Source: Compiled by the authors using company filings

Appendix 13. Liquidity cycle

Liquidity cycle			
	2014	*2015*	*2016*
Volvo	17,43	2,67	(6,02)
BMW	135,93	138,04	142,93
Renault	196,52	195,67	221,63
GM	(47,14)	(51,60)	(52,80)
Ford	(75,98)	154,57	108,88
Fiat Chrysler	(12,07)	(22,08)	(23,40)
Mazda	(11,81)	(9,67)	(6,66)
Peer Average	**30,91**	**67,49**	**65,10**

Source: Compiled by the authors using company filings

Appendix 14. German Government Bond Yield curve



Source: Own construction using data from Bloomberg as of 2017-04-17

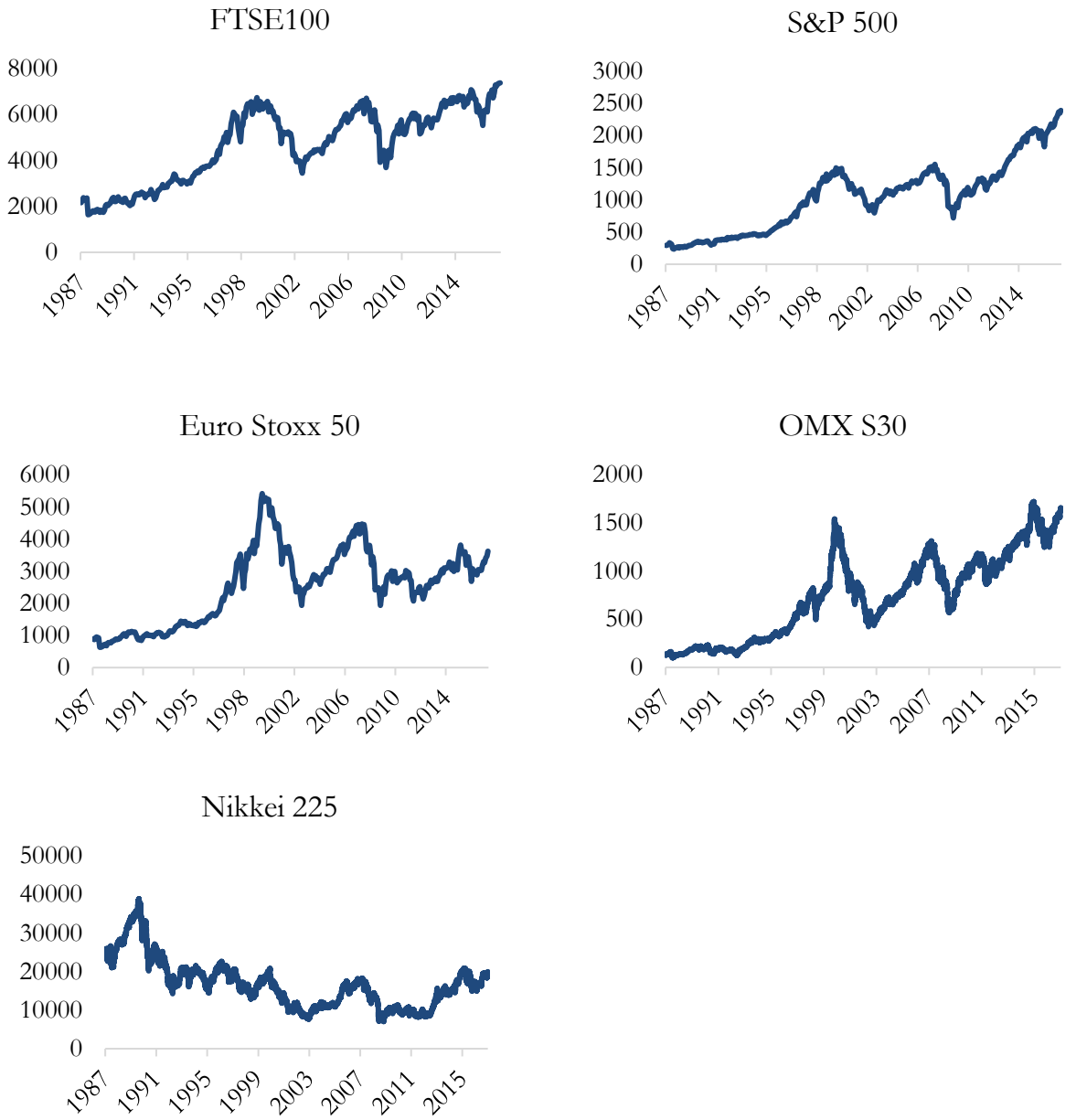
Appendix 15. Regression output: Beta estimation for comparable companies

10-Year Regression Output					
	Beta	*R-Squre*	*P-Value*	*Lower 95%*	*Upper 95%*
BMW	1,12	42%	0,0%	0,88	1,36
Renault	2,48	66%	0,0%	2,16	2,80
Ford	2,08	41%	0,0%	1,62	2,54
GM	1,45	37%	0,0%	1,01	1,89
Fiat Chrysler	2,19	51%	0,0%	1,80	2,58
Nissan	1,67	50%	0,0%	1,36	1,97
Mazda	2,08	36%	0,0%	1,57	2,58
Average	1,87	46%	0,0%	1,49	2,25

5-Year Regression Output					
	Beta	*R-Squre*	*P-Value*	*Lower 95%*	*Upper 95%*
BMW	1,23	30%	0,0%	0,75	1,72
Renault	1,93	35%	0,0%	1,25	2,61
Ford	1,23	29%	0,0%	0,74	1,73
GM	1,25	28%	0,0%	0,73	1,77
Fiat Chrysler	2,41	32%	0,0%	1,49	3,34
Nissan	1,42	32%	0,0%	0,88	1,96
Mazda	2,20	22%	0,0%	1,13	3,26
Average	1,67	30%	0,0%	0,99	2,34

Source: Source: Data Downloaded from Datastream

Appendix 16. Historical development key indices



Source: Own construction using data from Datastream

Appendix 17. Monte Carlo: Triangular distribution

A triangular distribution is a continuous probability distribution with a probability density function (PDF) with lower limit *a,* upper limit *b,* and mode c, where $a < b$ and $a \leq c \leq b$, where the area under the PDF is equal to 1. Probabilities can be obtained using the cumulate distribution function (CDF).

The formula for the CDF in a triangular distribution is given by:

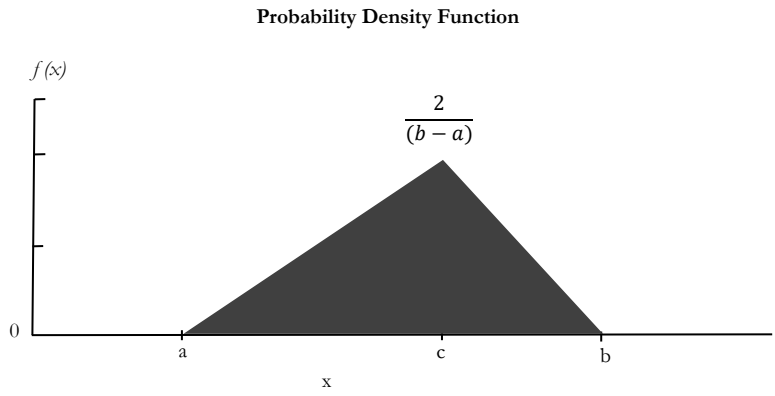
$$f\ (x) = \begin{cases} 0 \\ if x \leq a \\ \dfrac{(\mathrm{x}-\mathrm{a})^2}{(\mathrm{b}-\mathrm{a})(\mathrm{c}-\mathrm{a})} \\ if\ a < x \leq c \\ 1 - \dfrac{(b-x)^2}{(b-a)(b-c)} \\ if\ c < x < b \\ 1 \\ if\ b\ \leq x \end{cases}$$

The probability density function (PDF) is mathematical function of the probability distribution for continuous random variable. It is obtained by taking the first derivative coefficient of a distribution function *f (x),* with respect to *x*. By specifying the function parameters, the PDF is used to specify the probability of a random variable within the particular range of values, opposed to as taking on a single value.

The formula for the PDF in a triangular distribution is:

$$f\ (x) = \begin{cases} 0 \\ if x < a \\ \dfrac{2(\mathrm{x}-\mathrm{a})}{((\mathrm{b}-\mathrm{a})/(\mathrm{c}-\mathrm{a})} \\ if\ a\ \leq x \leq c \\ \dfrac{2(\mathrm{b}-\mathrm{x})}{((\mathrm{b}-\mathrm{a})(\mathrm{b}-\mathrm{c}))} \\ if\ c\ \leq x \leq b \\ 0 \\ if\ b < x \end{cases}$$

For a triangular distribution, this implies that the maximum value of the probability distribution function is $\frac{2}{(b-a)}$, which occurs at the peak value *c*. In the case that the probability distribution of the triangularly varaible is skewed, this implies that the that mean of the triangular distrubtion does not equal the most likely values (as used in the DCF analysis for example). Below is a graphial visualisation defined by the three values *a, c,* and *b.*



Given a random variate U drawn from the uniform distribtuin (equal probability) in the interval (0,1) it possible to generate triangular-distributed random variates as:

$$\begin{cases} X = a + \sqrt{U(b-a)(c-a)} \\ X = b - \sqrt{(1-U)(b-a)(b-c)} \end{cases}$$

0 for < U < F (c)

for F (c) ≤ U < 1

where $F(c) = \frac{(c-a)}{(b-a)}$

Source: (Evans, Hastings, & Peacock, 2000)*, (Vose, 2000) and* (Kotz & Ren Van Dorp, 2004).

Appendix 18. M&A: Economic value added

€ million	E2017	E2018	E2019	E2020	E2021	E2022	E2023	E2024	E2025	Teminal Value
Beginning Invested Capital	3.556	3.898	4.447	4.933	5.806	6.944	7.977	8.393	9.661	9.951
ROIC (Beginning Capital)	32,68%	32,78%	36,30%	35,78%	28,49%	23,33%	20,77%	20,01%	17,90%	17,90%
WACC	7,44%	7,44%	7,44%	7,44%	7,44%	7,44%	7,44%	7,44%	7,44%	7,44%
Economic Profit	897	988	1.283	1.398	1.223	1.104	1.064	1.055	1.011	1.042
Present Value Economic Profit	835	856	1.035	1.050	854	718	644	595	530	12.314

Enterprise Value	**22.986**
- NIBD (2016)	(942)
- Minority Interest	392
Intrinsic Value of Equity	**23.536**

Future Economic Profit as % of Enterprise Value	53,57%

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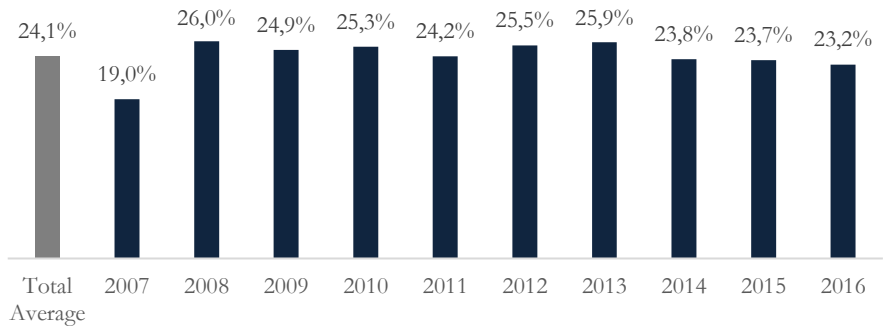
Source: Own construction

Appendix 19. Global average acquisition premium



Source: Own construction using data from Bloomberg