Valuation of Tesla Motors Inc.

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Master Thesis

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Executive Summary

Tesla Motors, Inc.

The purpose of this thesis is to determine value of one Tesla Motors share as of March 31st 2014. An analysis of external and industry specific factors will be followed by an internal analysis of the company, in order to identify the determinants of value creation. The thesis moves on to a financial analysis to determine the historical profitability of the company. The analysis is based on a reclassification and thorough assessment of financial statements.

Based on the findings from the analysis, Tesla's financial performance will be forecasted. A discounted cash flow model is used to determine the equity value, accompanied by a multiples and sensitivity analysis, to support the estimated value.

Tesla Motors is an innovative manufacturer of premium electric vehicles and electric vehicle powertrains, with the characteristics of a disruptive company. Their current product portfolio includes the Model S luxury sedan. Upcoming products include the Model X in mid-2015 and the Gen 3, a lower priced vehicle in 2017.

Tesla's growth will depend on factors within the company's control: project execution, store and infrastructure expansion, and quality, as well as external factors: economic development, gasoline prices and the development of battery costs. A key hurdle for Tesla is battery costs. For Tesla to drive electric vehicle adoption and become a mass-market player, battery costs must be reduced from the current estimated cost of USD 320 per kWh.

As a young player in a competitive and capital-intensive industry, much of Tesla's growth depends on proper execution of upcoming projects. In 2020, Tesla expects to produce at full capacity of 500,000 vehicles. I estimate unit sales of 398,000 and an EBITDA-margin of 14.5% in 2020. Based on my estimated value of USD 184.01, I see the current market price as expensive, supported by industry multiples. My estimate is lower than the current market value, indicating that most of the future profit potential is already priced in by the market.

TSLA

Price 31 March 14	USD 208.45
Target Price	USD 184.01
52-week range	USD 37.89 - 254.84

Key Metrics

Bloomberg: TSLA US **Reuters:** TSLA.O

Market cap. USD	25.7bn
Shares outstanding	123m
NIBD, USD	-136m
Enterprise Value, USD	22.6bn

Shareprice performance 2010-2014

ROIC Q1 14	-5,8 %
EBITDA-margin Q1 14	0,0 %
EBIT-margin Q1 14	-7,1 %
WACC	8,1 %

Highlights'000	F2012	F2013	E2014	E2015	E2016	E2017	E2018	E2019	E2020
Revenues	413 256	2 013 496	3 203 077	5 399 473	7 524 669	10 699 452	12 927 963	16 166 118	20 849 700
EBITDA	(365 458)	44 800	50 735	350 119	704 434	1 084 412	1 424 983	2 210 833	3 032 573
NOPAT	(394 418)	(63 503)	(61 116)	88 457	285 655	468 252	660 149	1 168 049	1 655 819
EPS		(0,6)	0,7	2,1	3,4	4,5	8,3	11,9	12,0
Revenue growth	102 %	387 %	59 %	69 %	39 %	42 %	21 %	25 %	29 %

Profitability	F2012	F2013	E2014	E2015	E2016	E2017	E2018	E2019	E2020
EBITDA-margin	-88 %	2 %	2 %	6 %	9 %	10 %	11 %	14 %	15 %
EBIT-margin	-95 %	-3 %	-3 %	2 %	5 %	6 %	7 %	10 %	11 %
ROIC (NOPAT)	-134 %	-12 %	-8 %	7 %	14 %	16 %	17 %	25 %	28 %

Multiples	EV/Sales			EV/EBITDA			EV/EBIT		
	2014	2015	2020	2014	2015	2020	2014	2015	2020
TSLA	7.1x	4.2x	1.1x	445x	64.5x	7.4x	N/A	191.5x	10.2x
Peers	0.9x	1.0x		7.2x	6.2x		11.7x	9.2x	

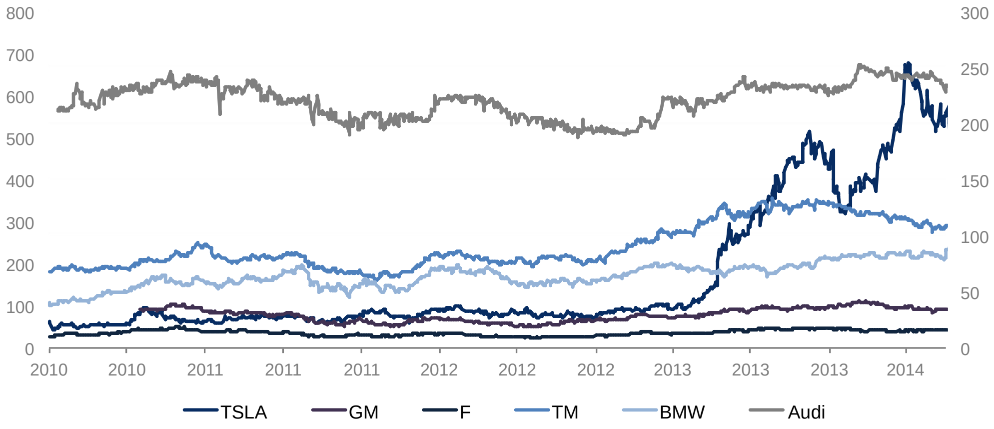
Table of Contents

1.0 Introduction and Motivation

The subject of this thesis is a valuation of the American electric vehicle company Tesla Motors, Inc. (TSLA). My motivation for writing this thesis stems from several factors.

The automobile industry is s highly cyclical business. The industry is closely tied to economical cycles and prices, and macro factors need therefore be analysed carefully to determine the future potential of the industry. Compared to the traditional segment, the alternative fuel segment benefits from increasing oil prices but are highly dependent on the political and technological environment in terms of supporting government initiatives and innovations that can drive down vehicle prices.

Figure 1.1: Share Price Development, EUR (L) and USD (R)



Source: Compiled by author / Nasdaq

After a century of fuelling vehicles with gasoline and diesel, the industry is in a transition towards alternative fuel sources, largely driven by regulatory compliance with fuel-efficiency standards, due to concerns about oil dependency and global warming[1]. Tesla is the youngest automobile company publicly traded and has outperformed many players in the industry. This can be seen from the comparison among competitors in figure 1.1. I find Tesla particularly interesting to analyse, due to their disruptive technology and their steep year-on-year growth rate. If Tesla's technology can challenge the notion of a "car" while also be socially beneficial, I believe the company will be an interesting contribution to a rather mature industry. It has recently been much debate among industry experts, whether Tesla's valuation is justified.

When measuring market capitalization against actual sales, Tesla's pricing is far from rooted in fundamental value drivers. The volatility of the stock price is unlike any other industry player. This is where I find a fundamental valuation and my analysis relevant.

[1] Boston Consulting Group (2014), "Accelerating Innocation: New Challenges for Automakers", p. 5

1.1 Problem Statement

The purpose of the thesis is to perform an in-depth analysis and valuation of Tesla Motors. Most traditional valuations and the theories on the subject, deals with mature companies. However, traditional valuation processes are challenged when faced with young and growing companies. The reason is that cash flows from operating activities are small and cash flows from investment activities is significant[2]. In the process of forecasting future cash flows based on past performance, investors are therefore faced with a challenge. However, while Tesla is a young company, they operate in a mature business. I therefore believe that an analysis and valuation based on fundamental drivers, is reasonable approach to determine the actual value of the company.

In this thesis, I will answer the following question:
What is the fair value of one Tesla Motors (TSLA) share as of 31.03.2014?

Sub questions

In order to answer this primary question, I will answer several sub questions:

Introduction to Tesla Motors and the Automotive Industry

- What characterizes Tesla's business model and strategy?
- What characterizes the industry?

Strategic Analysis

- Which external factors affect Tesla?
- How does the structure of the industry affect earnings potential?
- Does Tesla have a competitive advantage and is it sustainable?

Financial analysis

- How has Tesla's financial value drivers developed historically and relative to peers?
- What have been the drivers and challenges for Tesla's growth?
- What are the prospects for future financial performance?

Forecasting

- How will the expected market outlook affect Tesla's key driver?
- How will the costs and revenue develop with expansion of the business?

[2] Damodaran, A. (2009), "Valuing Young, Start-up and Growth Companies: Estimation Issues and Valuation Challenges".

Valuation and Sensitivity Analysis

- What is the appropriate discount rate for investors in Tesla?
- What are the forecasted operating cash flows?
- How sensitive is the valuation to fluctuations in the underlying estimates?

1.2 Delimitation

Tesla Motors is a global company, and is present on different geographical markets. Throughout the analysis, I will be using Tesla's own segmentation: North America, Asia and Europe. Furthermore, the following delimitations are made, due to the scope of this thesis.

- Tesla is not a 100% pure player in the automotive business. Their product portfolio consists of two main business areas: automotive and powertrain components. Automotive also includes sales of powertrain components and sales of emission credits. For the purpose of forecasting revenues, I will only be budgeting the vehicle business. Revenues from this business area accounted for 87% in 2013 and 95% in Q1 2014. However, all business areas will be addressed in the analysis, to get a complete picture of value drivers and growth prospects.
- I will exclusively use publicly available information, including Tesla's annual reports from 2009 to Q1 2014.
- All available information up to and including June 1st 2014 will be taken into account in the analysis.
- The chosen peer group: Bayerische Motoren Werke AG (BMW), Audi AG (Audi), Toyota Motor Corporation (Toyota), Ford Motor Company (Ford) and General Motors Company (GM), use different accounting standards. These include U.S. GAAP, IFRS and Japanese GAAP. In some areas, I have found it valuable to make correction (such as in the reporting of R&D) to increase the comparability with Tesla. However, due to the lack of details and the scope of this paper, it is not possible to correct them all. While I am aware that these differences may lead to less than optimal comparison, I do believe a proper benchmark analyses can be made.

1.3 Models and methodology

This chapter will provide a short description of the analysis, its purpose, and the chosen models and methodology. On the basis of the chosen models, the research is structured in six sections, followed by a sensitivity analysis and conclusion. After the initial chapter, the reader will be introduced to the case-company Tesla Motors. This brief description contains information about the organization, ownership structure and the marked- and product situation.

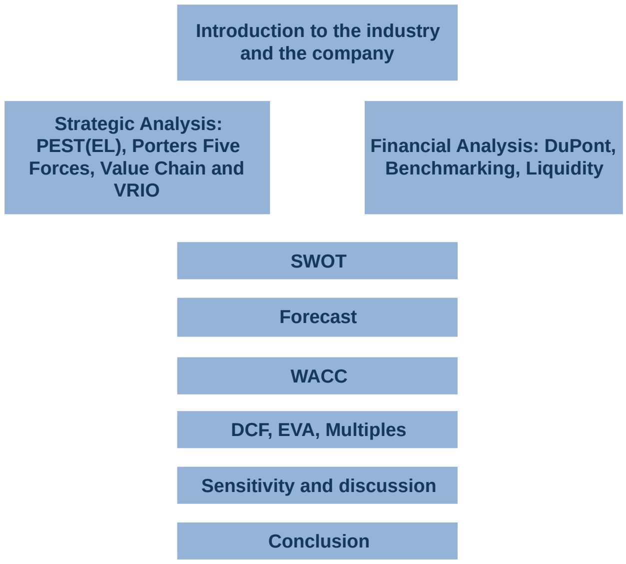
1.3.1 Data collection

The thesis is written from the perspective of an independent analyst and is based on publicly available information. The information used is primarily annual reports, research reports and market data. In order to structure the analysis in a representative matter, I have applied well-known theories and models. These will now be presented in more detail.

1.3.2 Strategic Analysis

It is essential for the valuation to estimate future cash flows. The foundation for these estimates will be made in the strategic analysis. The purpose here is to identify the non-financial value drivers, which I consider to have the greatest influence on the future value creation of the business. The analysis will follow a "top-down" approach, where a macro-environmental-, industry-, and internal analysis provides an assessment of Tesla's strengths, weaknesses, opportunities and threats.

Figure 1.2 Research Structure



Source: Compiled by author

1.3.2.1 External analysis: PEST(EL)

A PEST(EL) analysis is performed on a macro economical level, where the most relevant factors will be analysed[3]. The framework provides an understanding of the outlook of the market.

The PEST(EL) model can be criticized for not taking into account all the factors that affects Tesla's operations. The result of the analysis will to a large extent depend on the quality of inputs and how these are interpreted. As a result, there is a high risk that the result will be somewhat biased. Furthermore, the model provides only a static view of the factors. Since the reality is far from static, the analysis may quickly be out-dated and irrelevant. To address this issue, I have included a short discussion of the market outlook for the industry.

1.3.2.2 Industry Analysis: Porters Five Forces of Competition

Following the external analysis, I will focus on industry specific factors and explain the extent to which these factors influence the industry. The traditional model consists of two vertical sources of competition; the power of suppliers and the power of buyers, and three horizontal; competition from established rivals, competition from substitutes and competition from new entrants[4]. The traditional Five Forces model has also been criticized for presenting a static picture of the industry structure. The model was originally designed to deal with industrial societies, where production was the single area of focus. To address this issue, I have included briefly discuss the potential future changes in the industry.

[3] Political, Economic, Social, Technological, Environmental, Legislative

[4] Grant, R. M (2010), *Contemporary Strategic Analysis*, p. 69

1.3.2.3 Internal analysis: Porters Value Chain and VRIO

Porters Value Chain will be used to analyse Tesla's internal situation. The model identifies the company's core capabilities by focusing on organizational strengths that creates value for customers and provides a competitive advantage. The model provides a useful framework for analysing the company's activities.

Lastly, the *VRIO-model* is drawn upon to decide if the identified competencies generate a sustainable competitive advantage for Tesla. A competitive advantage stems from a company's. Each of the resources identified through the value chain analysis will be analysed by answering for questions:[5]

- Value: Does the resource enable Tesla to exploit opportunities or neutralize threats?
- Rarity: Is the resource only controlled by a limited number of firms?
- Imitability: Is there a cost disadvantage other firms in obtaining or developing it?
- Organization: Is the company positioned to exploit the resource?

1.3.3 Financial Analysis

As the next step in the valuation process, I will preform a historical financial analysis. In order to compare and benchmark performance across different periods and companies within the industry, and calculate the correct value creation, income statements and balance sheets for Tesla, BMW, Audi, General Motors, Ford and Toyota, will be reformulated based on Petersen & Plenborg (2012) unless otherwise stated. I have also drawn upon Damodaran (2012) and Koller et al. (2010) in cases where I have found it useful to draw upon several sources. Profitability, growth and risk will be focused on. The analysis of financial ratios will follow the structure of the Du Pont model as described by Petersen & Plenborg (2012). A complete overview of the model and the definition of each ratio can be found in Appendix 4.3.

1.3.4 Valuation

The theoretical valuation methods include present value models, relative valuation models (multiple analysis), liquidation models and contingent claim valuation. The two latter are not a part of this analysis, as they are only rarely used for companies who operate under highly unusual circumstances[6]. The choice between the respective methodologies presents a trade-off between four main criteria's that characterizes the ideal valuation model: Precision (unbiased estimates), realistic assumptions, usability and understandable results. None of the above mentioned methods comply with all four criteria's. According to Petersen & Plenborg (2012), the Economic Value Added (EVA) model is the best option, as it provides the most comprehensive result. Under the correct assumptions and application, the Discounted Cash Flow model (DCF) will provide the same result as the EVA model. It is based upon the fundamental value drivers of a company and should therefore be less exposed to "market moods"[7]. Thus, the DCF model identifies the underlying characteristics of the firm. Therefore, I view the DCF model to be the most appropriate method

[5] Barney, J. B. & Hesterly, W. (2012), *Strategic Management and Competitive Advantage*. p. 68
[6] Petersen & Plenborg (2012), Financial Statement Analysis, p. 237
[7] Damodaran, A. (2004), "An Introduction to Valuation", p. 24

for valuing Tesla. I will estimate the value of the company using both models to increase the validity of the estimated value. The validity of the value will also be tested using a multiple analysis.

Discounted Cash Flow Model

The DCF model determines the enterprise value (EV) based on free cash flows to firm (FCFF) using the following formula:[8]

$$Enterprise\ value_0 = \sum_{t=1}^{n} \frac{FCFF_t}{(1 + WACC)^t} + \frac{FCFF_{n+1}}{(WACC - g)^t} \times \frac{1}{(1 + WACC)^n}$$

The market value of equity is calculated by deducting the market value of net interest bearing debt.[9]

Economic Value Added

The EVA model separates value creation in three parts: invested capital in year 0, the present value of all future expected returns (EVAs) and the EVA in the terminal period. Again, the enterprise value is found by deducting the market value of invested capital. The enterprise value is calculated with the following formula:[10]

$$EVA_t = \sum_{t=1}^{n} \frac{EVA_t}{(1 + WACC)^t} + \frac{EVA_{n+1}}{(WACC - g)^t} \times \frac{1}{(1 + WACC)^n}$$

2.0 Introduction to Tesla Motors and the Automotive Industry

2.1 Tesla Motors

Tesla Motors is a manufacturer of electric vehicles and electric vehicle powertrain components, and was founded in Palo Alto, California in 2003[11]. In 2014, Elon Musk invested USD 30 million in the company and later became CEO. The company went public on NASDAQ stock exchange on 29.06.2010 under the ticker TSLA[12]. The current market cap is USD 25.68 billion and their operating income for 2013 was USD -61 billion, an increase from USD -393 billion in 2012.

The company launched their first vehicle, the Tesla Roadster in 2008 and currently sell the Model S luxury sedan in North America, Europe and China[13]. In 2013, the Model S received the highest customer satisfaction score of any car in world by *Consumer Reports*[14]. Tesla invests in charging infrastructure in the

[8] Petersen & Plenborg (2012), Financial Statement Analysis, p. 180
[9] Petersen & Plenborg (2012), Financial Statement Analysis, p. 217
[10] Petersen & Plenborg (2012), Financial Statement Analysis, p. 220
[11] Reuters, website, company profile (2014)
[12] Sager, Rebekah (01.07.2013), ”Tesla´s Stocks Soar”
[13] Tesla Annual Report (2014), p. 4
[14] Consumer Reports, website (February 2014)

U.S. and in Europe to allow vehicle drivers to drive free and long distances. In March 2014 they had 110 Supercharger stations and expect to expand in these regions as well as in Asia during 2014[15].

Tesla is strategically positioned in the automobile market as a high-end manufacturer and dealer. Their company-owned stores and service centres, technological innovations and high performance vehicle, is a competitive advantage.

In 2010, Tesla bought their manufacturing plant in Fremont, California, which was previously used to produce vehicles for Toyota and General Motors[16]. The facility is close to Tesla’s headquarter in Palo Alto and close to skilled engineers. The plant has a production capacity of 500,000 vehicles per year, and Tesla expects to deliver 35,000 this year. Musk has also announced that the company is targeting 500,000 vehicles by 2020, which would mean a CAGR of 56% from the 22,477 delivered in 2013.

The key hurdle to launch a mass-market electric vehicle is the supply of lithium-ion batteries. The shortage of supply of these batteries that powers Tesla’s vehicles is the reason why the Fremont plant is currently utilizing only 7% of full capacity[17]. To deal with this hurdle, Tesla plans to build the world’s largest Lithium-ion battery factory by 2017. If successful, this will allow Tesla to produce 500,000 vehicles annually[18].

Before describing the market and going into detail about Tesla, I find it necessary to highlight the areas in which Tesla stands out from the traditional automotive industry. Tesla departs from traditional model by exclusively focusing on electric powertrain technology and owning their stores[19]. Tesla has several of the characteristics of a disruptive company. Christensen (2001) argues that disruptive technologies often come from lower profit segments that industry leaders ignore. New entrants develop the technology and successfully sell to niche markets. By continuing to improve, they ultimately develop a technology that is more cost-efficient than the existing one[20]. Similar to previous disruptive technologies, there is no mass-market for electric vehicles. This may explain why entrenched automakers have not been more eager to push electric vehicles (EVs) to the market. Tesla has found a profitable, albeit small, segment. If they prove to be successful, Tesla may be a threat to the established automotive industry[21].

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[15] Tesla Annual Report (2014), p. 4
[16] Sibley, Lisa (27.10.2010), ”Tesla Officially replaces NUMMI in Fremont”.
[17] Tesla Motors, Fourth Quarter and Full Year 2013 Shareholde Letter.
[18] CNBC (19.03.2014), ”Tesla´s bet on winning the global lithium race”.
[19] Nasdaq OMX (20.03.2014)
[20] Christensen, C. (2011). *The Innovator's Dilemma: The Revolutionary Book That Will Change the Way You Do Business*, p. 336
[21] Agassi, S (19.08.2013), ”Tesla´s a Threat to the Auto Industry, But Detroit´s Reacting All Wrong”.

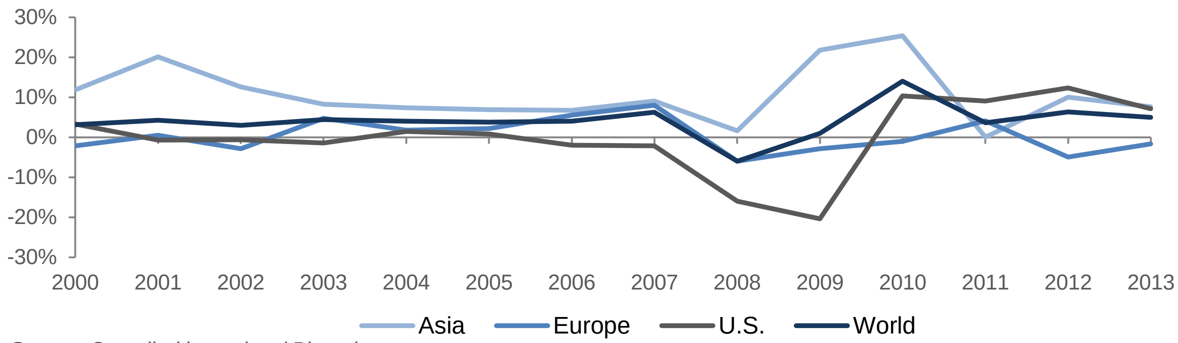
2.2 The Automotive Industry

The automotive industry is highly competitive, with 35 global players and the 10 largest companies controlling ~80% of the market. Tesla's market share is currently 2.6%[22].

Growth rates

The number of passenger cars and light vehicles sold globally was 76.3 million in 2013, a 5% increase from 2012[23]. Since 2000, world vehicle sales have been growing at a CAGR of ~4%.

Figure 2.1: Automotive Sales Growth



Source: Compiled by author / Bloomberg

As can be seen from 2.1, volume growth differs across global markets. The U.S. market has been growing since 2009 and has reached a higher growth level than before the financial crisis of 2008. Since 2010, sales have been growing at a CAGR of 10%, which is more than any other market. Asia has experienced the highest growth rate over the entire period from 2000 through 2013, but growth has been declining in recent time. Still, Asia pacific is the largest market with 46% of global sales in 2013. Asia has experienced a CAGR of 6% over the last three years[24]. As a result of the crisis in Europe, Tesla is focusing on strong European economies such as the UK, Germany, The Netherlands, Switzerland and Norway. However, most of the growth going forward will come from China, which is expected to remain the largest light-vehicle market through 2020[25].

Premium segment

The global premium segment accounted for 9.8% of total vehicle sales in 2013 and is expected to grow to 10.7% in 2020[26]. Sales cyclicality varies across segments. In the premium segment, competition rests on factors such as quality and brand image, resulting in lower price cyclicality compared to mass-market

[22] Bloomberg data (30.02.2014)
[23] Bloomberg data (30.02.2014)
[24] Bloomberg data (30.02.2014)
[25] Standard & Poor´s (2013), "The Global Auto Industry Shifts Its Focus To Overseas and Emerging Markets". p. 16
[26] Little, A. D. (2013), "Battle for Sales in the Premium Segment: Six Key Levers Impacting Current Automotive Sales Models". p. 1

manufacturers. Despite intensified competition in the premium vehicle market, the segment has not been gaining significant market shares in the past years. BMW, Lexus and Mercedes-Benz have historically held the largest market shares, with Audi and Cadillac continuing to increase their presence in the segment. In a study by HIS Automotive, they forecasted the premium vehicle segment to account for 10.7% of total sales in 2020[27].

2.2.1 The Electric Vehicle Market

The electric vehicle (EV) industry has in the past years moved past the infant state, which was characterized by a number of young companies that failed to commercialize their electric cars. In today's early adolescence, business models are starting to shape and reach profitability. Competition in the automotive industry is intense, and increasing regulatory standards, pressure manufacturers to reduce vehicle emissions. New regulatory requirements coupled with technological advances in powertrain are shifting demand towards electric-based vehicles[28]. The Electric Vehicles Initiative (EVI) seeks to have 20 million EVs on the road by 2020 and 2.4 billion charging stations[29]. In early 2014, there were more than 400,000 EVs on the road worldwide[30]. The goal set out by the EVI, implies a CAGR of more than 90% from the current level[31].

Electric vehicle segments

Tesla competes in the market based on the traditional automotive segment as well as in the market for alternative fuel vehicles. The latter consist of three segments: Electric vehicles (EVs), plug-in hybrid vehicles (PHEV) and hybrid electric vehicles (HEV)[32]:

- *Electric Vehicles* are completely powered by a single energy storage system (battery packs) that must be refuelled from an electricity source. The Model S is an example of an electric vehicle.
- *Plug-in Hybrid Vehicles* are powered by both a battery pack and an internal combustion engine, and can therefore be fuelled both with traditional petroleum and electricity.
- *Hybrid Electric Vehicles* are powered by both a battery pack and an internal combustion engine, but can only be refuelled with petroleum as the battery is charged with regenerative braking.

Sales volumes of hybrid cars have also been fluctuating with the overall economy during the past years. The market was hit hard in 2008, but sales began to pick up when the U.S. economy stabilized in 2012[33]. However, in terms of volume growth, the hybrid and electrical car market has outperformed the traditional

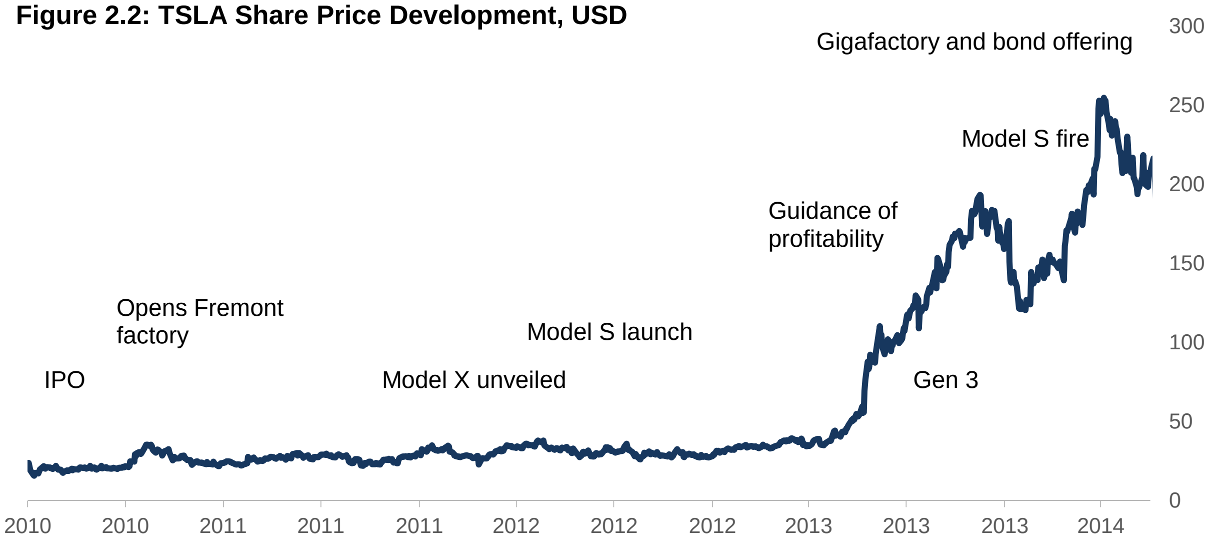
[27] Libby, T. (08.01.2014), "Luxury Share of U.S. Auto Market Remains in 10-11% Range".
[28] Tesla Annual Report (2014), p. 21
[29] Clean Energy Ministerial (2014), Electric Vehicle Initiative (EVI).
[30] Electric Vehicle News (2014)
[31] (20 million/400,000)^(1/6)-1 = 92%
[32] Tesla Annual Report (2014), p. 21
[33] Market Line (17.03.2014), "Hybrids and Electric Cars in the US – Two differing strategies", p. 7.

gas fuelled car with a CAGR of 13.6% from 2008 to 2013, compared to 3.3% for traditional vehicles. According to IHS Automotive, production of plug-in hybrids and electric vehicles are expected to account for 5.7% of total vehicle production in 2019[34].

2.3 Historical Events and Share Price Developments

Tesla is the first publicly listed pure play electric vehicle manufacturer. Since the IPO in 2010, the share price has been highly volatile, but climbing as of 2013. The price was USD 17 at the date of the IPO and reached a record high of USD 254.8 in March 2014. As of March 31st, the price is USD 208.4, giving an annual return of ~57% since the IPO[35]. The continuous increase has been driven by the company's ability to exceed the markets expectations.

Figure 2.2: TSLA Share Price Development, USD



Source: Compiled by author / Nasdaq / teslamotors.com

In 2012, Tesla launched the Model S and revealed the Model X. During 2013, the company announced a series of positive events, including a guidance of full profitability in the first quarter of 2013 (in non-GAAP terms). In 2013, Tesla also announced a secondary share offering, their plans to expand the charger network and plans to create a cheaper vehicle (Gen 3). The stock price fell on news about a Model S vehicles catching fire, but rose again on announcements of plans to build a Gigafactory before 2020, that will create batteries and cells for the stationary storage market. To finance the battery factory, Tesla offered USD 1.6 billion in convertible bonds. In Q1 2014, Tesla delivered its first car to China and has to date delivered a total of 6,457 Model[36].

[34] Bloomberg (2014).
[35] CAGR = (IPO price/price today)^(1/years)-1
[36] Tesla Annual Report (Q1 2014), p. 4

2.4 Organization

The company is vertically integrated, and sell cars directly to consumers through a network of company-owned stores. Manufacturing and assembly is integrated at the Tesla Factory in Fremont, California and at the assembly facility in the Netherlands, which deliver vehicles to the European market[37]. The factory in Fremont has a capacity of 500,000 vehicles per year. Tesla also intends to build a battery cell factory by 2020, to supply future vehicle models. In addition to the following presentations of Tesla's strategy and business model, the management team is presented in Appendix 1.1.

2.4.1 Strategy and Business Model

From a valuation perspective, it is important to understand Tesla's strategic objectives and business model. An analysis of the internal and external aspects of the business will be covered in detail in the strategic analysis. In order to evaluate to which degree Tesla have been successful in obtaining strategic objectives, I have outlines their goal[38]:

> *Tesla's goal is to accelerate the world's transition to electric mobility with a full range on increasingly affordable electric cars. We are catalysing change in the industry. Tesla vehicles and EVs powered by Tesla are fun to drive and environmentally responsible.*

2.5 Ownership Structure

The management of the company holds the majority of Tesla's shares. While insiders combined own 23.2% of share outstanding, the dominant shareholder is CEO Elon Musk with 22.8% ownership[39]. The largest outside shareholder is Fidelity Management and Research Centre with 7.96% ownership, while Daimler AG and Toyota Group are among the ten largest shareholders. Their stake in the company is largely due to the powertrain partnership with Tesla, which I will elaborate on shortly. The remaining shares are divided among institutions and funds[40]. In terms of geography, 53% of shares are held in the U.S. with the remaining amount held by investors in various countries worldwide.

2.6 Business Segments

Over the period from 2012 to 2013, Tesla quadrupled their revenues and achieved a positive profit margin (EBITDA) for the first time in their operating history. This development caused the stock price to accelerate to new hights. In order to understand the factors that have historically been driving the growth seen from figure 2.3, it is important to identify all sources of revenue. While Tesla is first and foremost a vehicle manufacturer who operates in the automotive industry, they also profit from other segments.

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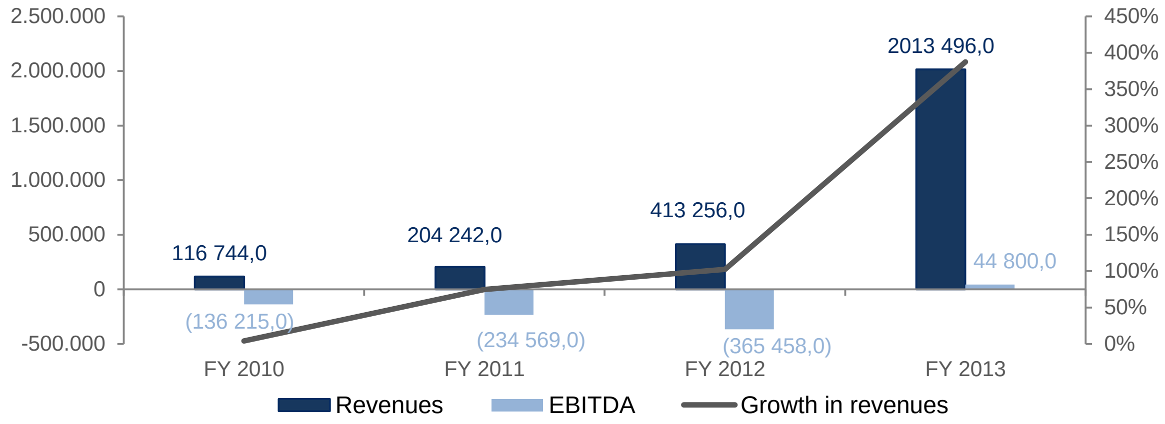
[37] Tesla Annual Report (2014), p. 13
[38] teslamotors.com/about
[39] Bloomberg (2014)
[40] Bloomberg (2014)

Figure 2.3: Development in Revenue and EBITDA, USD 1,000



Source: Author / Company Reports

Tesla's revenue comes from operations within *automotive sales* and *development services.* The core business is automotive sales, which accounted for 99.6% of gross profits in 2013. By breaking down automobile sales, it can be seen that these revenues includes sales of vehicles, emission credits and powertrain components. As a result, only 87% of Tesla's revenues come from actual vehicle sales. However, by Q1 2014, the share of vehicle sales had grown to 95%. Development services have only limited contribution to the result, and revenues have fluctuated between USD 16 and 57 million in the last four years.

2.6.1 Development and Sales of Powertrain Components

Sales and services related to powertrain components accounted for 3% of revenues in 2013. Tesla provides services for the development of electric powertrain systems and components, and sell powertrain components to Daimler AG and Toyota Motors[41]. In 2008, Tesla entered into a powertrain development agreement with Daimler. By the end of 2009, product development under this contract was completed, and deliveries began in 2010. To date, Tesla has sold 2,600 battery packs to Daimler and expects to deliver more in 2014. Tesla also cooperates with Toyota on the development of a powertrain system for Toyota RAV4. Deliveries are expected to complete this year[42]. Since revenues from development of sales of powertrain components have been entirely generated from these two agreements, future revenue from this business is highly uncertain.

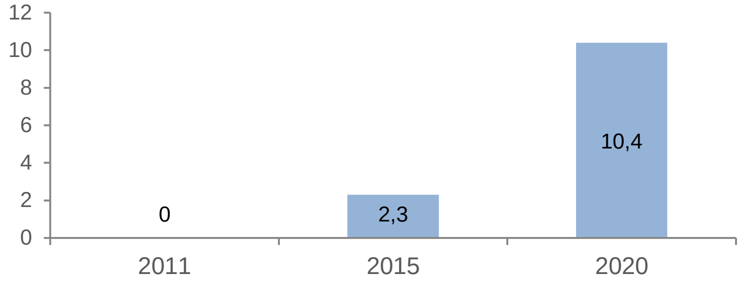
2.6.2 Emission credits

Certain U.S. states have laws that require manufacturers to ensure that a given portion of vehicles sold in the state, are emission free vehicles. Manufacturers that earn excess credits can sell these to other companies who seek to comply with regulations. Since all of Tesla's vehicles are zero emission vehicles, they recognize

[41] Tesla Annual Report (2014), p. 4
[42] Tesla Annual Report (2014), p. 15

revenue from sales emission credits[43]. As competition in the EV segments increases, and manufacturers conform to these standards, these revenues will likely phase out.

Figure 2.4: Li-ion Battery Demand (Gwh)



Source: Roland Berger

2.6.3 Stationary storage

In 2013, Tesla began developing stationary energy storage products for use in homes. The plan is to start sales of these battery systems during 2014 in order to profit on their capability in battery technology (the capability will be discussed in later sections)[44]. According to Roland Berger, Lithium-ion batteries are in an early stage of development in electric storage systems, and demand for these systems will grow with a CAGR of 35% from 2.3 GWh in 2015 to 10.4 GWh in 2020[45]. Morgan Stanley estimates the battery storage business to be worth USD 2 billion globally[46]. If Tesla is successful with the Gigafactory, these segments may open up to new revenue sources. However, due to the uncertainty of the development of this segment, it will not be included further in the analysis.

2.6.4 Automobiles

Tesla's strategy for bringing electric vehicles to the mass market is a three-step process depending on their ability to utilize production capacity at the Tesla Factory. The first step was to produce a high-price/low-volume car (The Roadster), followed by a mid-price/mid-volume car (Model S and Model X), and finally a low-price/high-volume car (Gen 3). Currently, Tesla is past halfway into their strategy.

2.6.4.1 Previous models

Tesla Roadster was the first automobile to use Lithium-ion battery cells and the first all electric vehicle to travel more than 320 km per charge[47]. Tesla terminated the production of the Roadster sports car in 2012.

2.6.4.2 Current models

Tesla Model S was unveiled in 2009 and launched in 2012. Model S is developed and assembled at Tesla's Fremont factory. As of 2013, 22,477 vehicles had been sold worldwide and the company delivered 6,457 more in the first quarter of 2014. Tesla expects to deliver 7,500 in Q2 and 35,000 in total for 2014[48]. For the Model S, Tesla is benchmarking the performance of BMW 5-series. Thus, the vehicle should compete in the premium vehicle segment. Model S is offered with three different battery pack options: 60kWh, 85kWh and

[43] Tesla Annual Report (2014), p. 98
[44] Tesla Annual Report (2014), p. 8
[45] Roland Berger (2012), "Technology and Market Drivers for Stationary and Automotive Battery Systems".
[46] Market Watch (25.02.2014), "Tesla Power? Why Tesla may want to sell you more than an electric car"
[47] Motor Authority (11.04.2010), "The World´s Only Electric Sports Car: 2010 Tesla Roadster".
[48] Tesla Quarterly Report (Q1 2014), p. 4

an 85kWh performance version. The three versions vary in driving range, top speed, motor power and price as shown in table 2.1[49]. The Model S offers better range than any other vehicle on the market.

Battery Pack

The battery pack consist of more than 7,000 electric vehicle lithium-ion battery cells, produced by Panasonic, and contain 2-3 times the energy of other electric vehicle battery packs on the market. This significantly increases the range of the Model S[50]. Tesla's battery pack uses the same Li-ion cells that are typically used in consumer electronics and laptop batteries. These cells are relatively low in cost.

Table 2.1: Model S Features	**60 kWh**	**85 kWh**	**85 kWh Performace**
Price in the U.S.	$69,900	$79,900	$93,400
Range	242 miles	312 miles	312 miles
0 to 60 mph	5.9 seconds	5.4 seconds	4.2 seconds
Top speed	120 mph	125 mph	130 mph
Max power	285 kWh	285 kWh	350 kWh
Supercharging	($2,000)	Included	Included

Source: Compiled by author / teslamotors.com

Powertrain

Compared to a traditional combustion engine with hundreds of moving parts, the Tesla motor has only one: the rotor. Model S acceleration is therefore instantaneous, and can go from 0 to 60 miles per hour in 4.2-5.9 seconds[51]. With few moving pieces, there is also less tear on the engine, reducing the need for maintenance.

Zero Emissions

Traditional gasoline-powered and hybrids burn refined petroleum. Tesla vehicles can use electricity no matter the source (coal, solar, hydro or wind power) and can be recharged with an adapter or at charging station, which refuels the entire battery in 30 minutes[52]. However, this is still longer than the minutes it takes to fill the tank of an internal combustion engine (ICE). In terms of price, Tesla estimates the cost of fuel to be ~20% of that of ICEs that run on gasoline.

2.6.4.3 Upcoming models

A prototype for *Tesla Model X* was revealed in 2012. Model X is a high-performance SUV that will have seats for seven adults. The vehicle will be built on the same platform as Model S, offered with the same battery options and be priced slightly higher than the Model S (due to its size). Tesla expects Model X to be delivered to customers during 2015 and is targeting a production of ~20,000 vehicles per year[53]. The car will be sold in the same geographical markets as Model S. Tesla has also announced their intention to develop a third generation vehicle, *Gen 3,* which will be produced at the Tesla factory. The objective is to offer a vehicle at a lower price point and in higher volumes than Model S. The current guidance is a price below

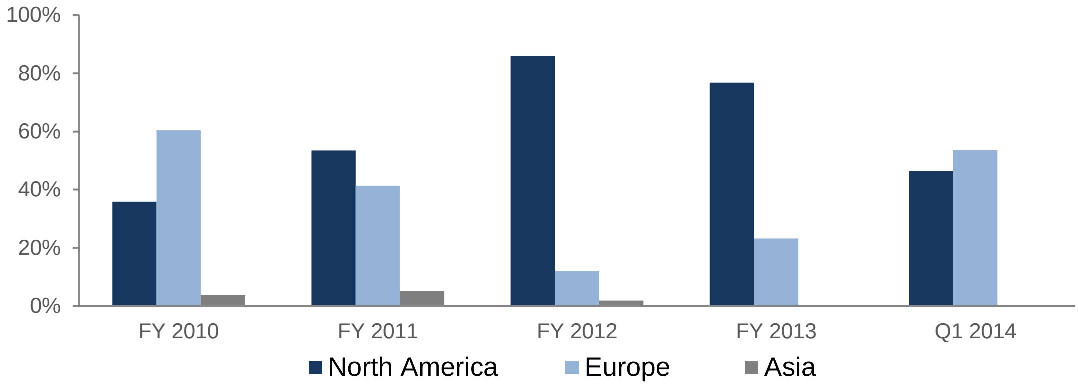
[49] teslamotors.com
[50] Tesla Annual Report (2014), p. 5
[51] teslamotors.com
[52] teslamotors.com
[53] Tesla Annual Report (2014), p. 4

USD 40,000, which is almost half the price of the Model S. It will also use a 48 kWh battery - 20% reduction from the batteries currently used. According to Tesla, they expect production of Gen 3 to begin in 2016 followed by deliveries in 2017[54].

2.7 Geographical Segments

In order to review the competitive advantage and the growth prospects for Tesla, it is important to review their ability to extend market shares. Tesla has three main geographical markets. Figure 2.5 illustrates the distribution of revenue across each segment.

Figure 2.5: Geographical Segments



Source: Compiled by author / Tesla Annual Report

North America has historically been the largest segment, accounting for 77% of total revenue in 2013. Prior to 2012, Tesla's only product was the Roadster. The vehicle generated most of it sales in Europe and North America, with only limited sales in Asia. Tesla began deliveries of Model S in 2012, focusing exclusively on North America. The amount of sales generated in Europe and Asia in 2012, was the remaining inventory of the Roadster[55].

Tesla began deliveries of Model S in Europe in Q3 2013. The nine stores that were bought for sale of the Roadster were re-used for the Model S. While Tesla is planning on a broad rollout throughout Europe, deliveries began in Norway, Switzerland and the Netherlands. These markets were selected, as they have high import tariffs on gasoline driven luxury cars, but have significantly reduced these tariffs for foreign electric vehicles. Norway is Tesla's largest market in Europe, a development that can largely be explained by the "engansavgift". This one-time tax fee (including VAT) makes the upfront cost of a traditional luxury

[54] Tesla Annual Report (2014), p. 8
[55] Tesla Annual Report (2013), p. 7

vehicle with the same price, weight and maximum motor power as a Model S, USD ~97,000 (NOK 580,000)[56] [57] more expensive.

China is the largest automotive market in the world and the largest producer of emissions[58]. It is also the fastest-growing luxury vehicle market, which makes China an important market for luxury EVs in terms of growth potential[59]. Tesla is planning on establishing a presence in China in 2014. Major variables affecting the long-term value of the company, is contingent upon progress in China. Currently, the Model S is priced at USD ~120,000 in China (almost 50% more than in the U.S.) due to import duties imposed on foreign companies. This price range position Tesla in the middle luxury segment with other foreign competitors such as Audi and BMW[60]. Local production would qualify Tesla to avoid import duties and receive subsidies, but this requires Tesla to form a joint venture with a Chinese partner. Tesla continues to invest in infrastructure in China, Japan and Hong Kong and is expanding capacity in China[61].

3.0 Strategic Analysis

3.1 PEST(EL) Analysis

Macro economical factors are events or conditions over which a company does not have control. This section discusses and identifies external factors that are likely to affect Tesla's performance in terms of profitability and risk. Demand for automobiles is a function of different factors. Revenue is to a large extend determined by factors which they have no influence over, especially economic growth and the price of oil and gas. However, revenues are also driven by factors that are, to some extent influenced by Tesla. Battery costs and infrastructure is the most significant. Since Tesla is leading the way in the plug-in electric vehicle market, they are able to affect the external factors that influence the market. Thus, the external analysis has to also recognize these factors in order to provide a full picture of external drivers.

3.1.1 Political and legislative drivers

The role of the government is highly significant in the auto industry and energy and environmental policies will play a vital role in forming the industry in coming years. Political change is heightening the need for sustainability and conformity with CO_2 limits. For the automotive industry, this increases the pressure to reduce fuel consumption and emissions.

56 Mick, Jason (24.04.3014), "As Sales Level in the U.S., Tesla Model S Charges Ahead in Europe, China".
57 Smarte Penger (16.04.2014)
58 Marquis, C., Zhang, H., Zhou, L. (2013), "China´s Quest to Adopt Electric Vehicles". p. 1
59 McKinsey & Company (2013), "Upward Mobility: The Future of China´s Premium Car Market".
60 The Wall Street Journal (23.01.2014), "Tesla in China to Charge $120,000 for Model S".
61 Tesla Annual Report (2013), p. 67

Incentives

In order to reduce the dependency on oil, governments across the world are providing incentives to consumers and manufacturers for the adoption of electric cars. Supply side incentives help manufacturers and suppliers enter the EV market, expand operations or conduct research and development, while demand side incentives involves tax credits to reduce the initial cost and the operating cost of EVs, and various non-financial incentives[62]. The Department of Energy (DOE) has set aside USD 25 billion for helping automakers create fuel-efficient vehicles through their Advanced Technology Vehicle Manufacturing (ATVM) Loan Program. Fuel Economy standards also force manufacturers to drive consumer demand towards alternative powertrain vehicles, in order to achieve regulatory compliance[63]. While government subsidies are a significant market driver today, it is unknown whether these incentives will sustain when EVs approach mass adoption.

Local governments have various policy incentives for the purchase of greener vehicles. The US government offer tax credits to consumer, both as an upfront reduction in purchasing price and to cover expenses related to home charging systems[64]. A tax credit of USD 7,500 for the purchase of plug-in electric vehicles in the U.S. is considered the most crucial incentive, but will cease once a manufacturer has sold 200,000 vehicles[65].

In Europe, Denmark and Norway gives the highest benefits to EV buyers, while there is a lower level of support in Central and Eastern Europe. In Asia, the Chinese government offers as much as USD 9,800 in cash incentives, while Japan offers purchase incentives of up to 1,000,000 JPY (USD ~10,000). The early adoption of electric vehicles is therefore partially attributed to these incentives. However, tax incentives along with free parking and similar exemptions are starting to phase out and may have an adverse affect on the adoption rate of EVs going forward. The primary incentives offered to EV customers are summarized in table 3.1.

[62] International Economic Development Council (2013), "Creating the Clean Energy Economy: Analysis of the Electric Vehicle Industry". p. 33
[63] Bloomberg Industries (07.05.2014)
[64] PriceWaterhouseCooper (2013), "State of the Plug-in Electric Vehicle Market".
[65] Alternative Fuel Data Centre (06.04.2014), "Qualified Plug-In Electric Drive Motor Vehicle Tax Credit".

Table 3.1: EV Incentives in Tesla's Main Markets

	US	Norway	Switzerland	The Netherlands	China and HK
Taxes	$7,500 Federal tax credit	Lower annual fee; higher milage allowance writedown; exemption from congestion charge, initial car tax and VAT (~$97,000); 50% discount on company car tax	Depending on canton (county) reduction/no annual road tax	Exclusion of vehicle tax until 2015; No BPM (private motor vehicle tax) until 2017; 4% Bijtelling (tax credit) for 5 years	Up to $9,800 tax credit (China); registration tax waived (HK)
Subsidies	Various purchase subsisies/rebates for Evs				Free vehicle licence worth up to $14,000 (China)
Parking	Parking incentives for Evs	Free access to some parking spots			
Bus lanes	Access to HOV lanes	Bus lane access			
Other	Several other incentives for EV owners	Free pass in toll roads			

Source: Compiled by author / fueleconomy.gov / teslamotors.com / belastingdienst.nl

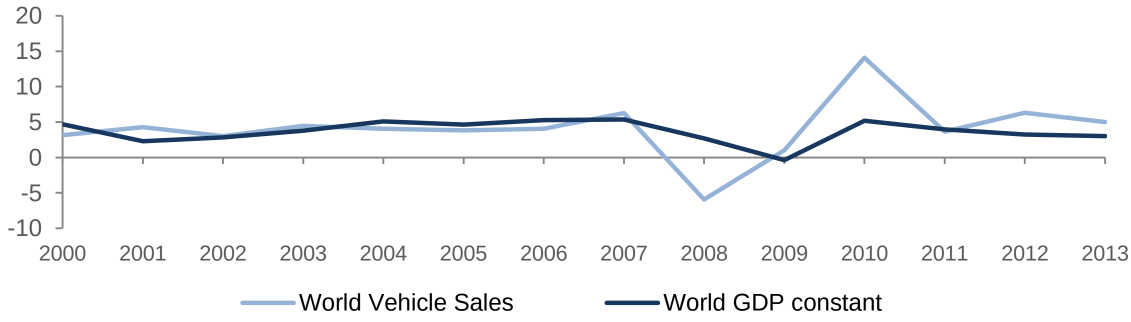
3.1.2 Economic drivers

3.1.2.1 Economic development

Activity in the automotive industry tends to move with the overall business cycle. The relationship between GDP and automotive demand can be seen from figure 3.1 which show the development of GDP and vehicle sales from 2000 through 2013.

Automotive companies depend heavily on consumer trends, as consumer sales accounts for the largest source of revenue. Vehicles represent big-ticket items for most consumers, and consumer confidence is key when considering a purchase. For this reason, vehicle sales tend to move with consumer confidence, which is directly related to GDP. The correlation between global GDP, and global automotive sales was 0.5 from 2005 until 2013, with the highest correlation in the U.S. (0.8) and the lowest correlation in Asia (0.15). In the years from 2008 to 2013, the correlation between economic growth and vehicle sales were as high as 0.8 (see Appendix 3.1).

Figure 3.1: Sales Growth (%) and GDP

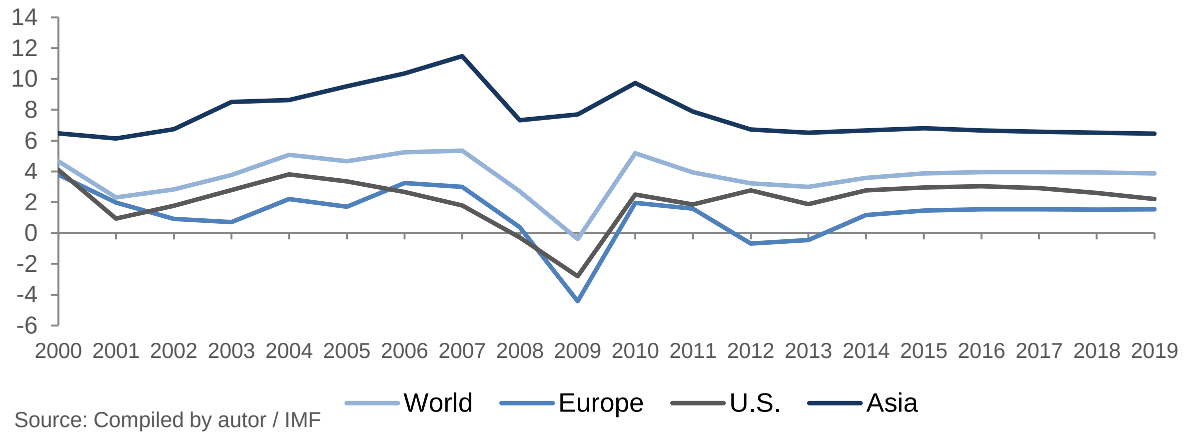


Source: Compiled by author / Bloomberg / IMF

During the financial crisis of 2008, GDP in developed markets experienced negative growth, leading to a decrease in vehicle supply and demand. This downfall resulted in this decade's lowest level of production in 2009, which almost destroyed the U.S. auto industry and threatened the two largest manufacturers General Motors and Chrysler[66]. Downturns in the economy tend to lead consumers to delay the purchase of a new car, unless replacement is necessary. Due to postponed purchases in the developed countries from 2008 to 2011, pent-up demand was created which lead to an increase in sales in 2012 and 2013[67]. This can be seen from figure 3.1, where vehicle sales grew, while GDP trended slightly downwards.

As can be seen from figure 3.2, bot the U.S., Europe and Asia experienced economic contraction during 2007-2009, although Asia was less affected than North America and Europe. In the years after the crisis, all economies grew, with the U.S. economy recovering at the fastest pace. From 2011 through 2013, the Euro zone again experienced negative growth, before GDP began to rise slowly in end-2013[68]. In developed economies, the recovery from the financial crisis has been driven by fundamental factors such as a record-low key interest rate and quantitative easing, initiated by the U.S. Federal Reserve and the European Central Bank to boost inflation[69]. While GDP in all markets have recovered since the financial crisis, Asia has seen a significantly higher economic growth over the entire decade, with China being one of the fastest growing economies in the world. As a result, China has been a critical market for global automakers in order to offset falling sales in Europe[70].

Figure 3.2: Historical and Expected GDP Key Markets



Source: Compiled by autor / IMF

[66] Centre for American Progress (09.10.2012)
[67] Bloomberg (25.02.2014)
[68] Herari, D. (2014), "US economy: developments since the 2008/2009 recession", p. 2-4
[69] DNB Markets (2014), "Økonomiske utsikter", p. 5
[70] Business Insider (09.01.2014), " China´s Booming Car Market Is Terrific News for Western Automakers".

Outlook for the world economy

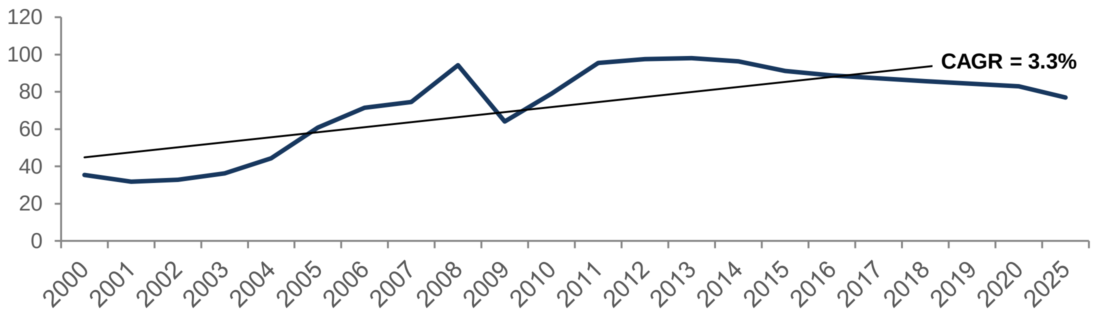
The global outlook for GDP looks positive. After a downturn in the preceding couple of years, the global economy stabilized in 2013, ending at a growth rate of 3.0%. The economy is expected to improve further over the next two years as advanced economies continue to recover. According to IMF (2014), Global growth is expected to reach 3.6% in 2014 and 3.9% in 2015. From 2015 through 2019, growth is expected to be within the interval of 3.9% and 4.0%[71]. Going forward, Asia will be the main driver of global economic growth. Asia is expected to grow 6.7%, while the U.S. is expected to grow 2.8% in 2014. As the Euro zone recovers from the recession, GDP is expected to grow 1.2% in 2014, up from -0.5% in 2013.

3.1.2.2 Commodity and energy markets

Crude oil

The price of crude oil has significant implications for automakers, as fluctuations in gasoline prices affect the purchasing power of consumers and the cost of production. Oil and gas is a non-renewable fuel with limited supply. Since oil is traded globally, rising prices impacts the entire auto market. Rising oil prices have mixed effects on the industry, as they will decrease demand for new ICE vehicles, but drive adoption towards electrical vehicles. An example of sensitivity to gas prices occurred when oil prices rose up to mid-2008, driving material costs up and shifting consumers' preferences towards smaller vehicles. As a result of the recession, the average gas price fell sharply to USD 62 per barrel in 2009. Oil prices reached a 10-year high in 2011, prompting higher sales of electric and hybrid cars[72]. Since then, prices have continued to rise up to USD 98 per barrel of WTI crude oil and USD 108 per barrel of Brent crude oil in 2013[73].

Figure 3.3: Crude Oil, avg spot, USD/bbl



Source: IMF

[71] IMF, World Economic Outlook - Database
[72] Market Line (2014), "Hybrid and Electric Cars in the US: Two differing strategies", p. 11
[73] BMW Annual Report 2013, p. 25

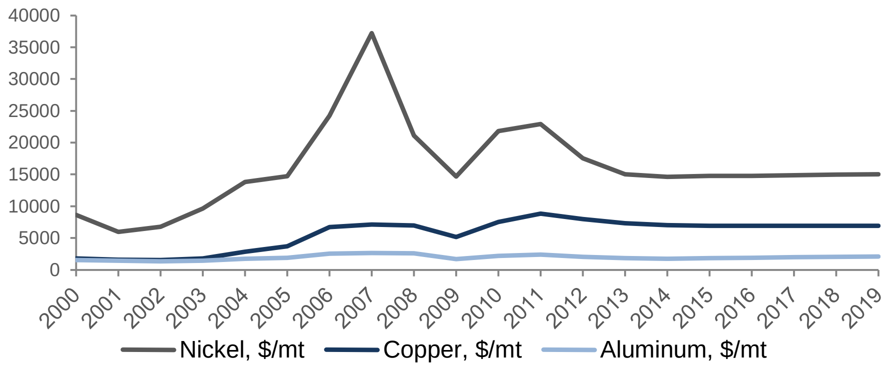
Outlook for oil prices

Oil prices in North America have declined recently, and most financial institutions expect prices to continue to fall slightly over the next years. In Europe the price of crude oil held a high level in 2013, due to the uncertain situation in the Middle East[74]. According to International Energy Agency (IEA), almost half of the global oil demand is expected to come from China over the next decade, and oil demand will continue to grow in Asia due to a rising transportation sector. On the other hand, demand in OECD countries is expected to decline. While average prices may decline slightly in the short-term, they are likely to trend higher over the long-term, given global demand. Economic growth is the most important driver of oil demand, and with GDP expected to rise globally, I expect oil prices to trend higher in the long-run.

The World Bank and IMF expect oil prices in the range of USD 89-98 per bbl over the next two years[75]. Combined with expectations of higher demand, I find it unlikely that prices will trend below this level.

3.1.2.3 Raw materials

Figure 3.4: Historical and Expected Commodity Prices



Source: Compiled by author / World Bank

Rising commodity prices leads to pressured margins and costs that cannot be passed on to consumers, due to the competitive pressure and long lead-time in the industry (I will describe the competitive nature in the next section)[76]. This, in turn has a negative affect on profitability. According to Bloomberg, the average cost structure of a passenger vehicle is comprised of ~47% steel in addition to iron, plastics, aluminium, glass and other materials. As global penetration of electric vehicles rises, so will the demand for raw metals used for batteries. Tesla is especially subject to volatility in battery input prices such as lithium, nickel and copper. They are also exposed to changes in aluminium prices, as they use mainly aluminium for the vehicle body[77].

Lithium

There is already a market for Lithium-ion (Li-ion) batteries, which is commonly used in portable electronics devices. According to Goldman Sachs, Tesla's battery factory (at full capacity) will consume as much as

[74] BMW Annual Report 2013, p. 25
[75] EIA (2014), "Annual Energy Outlook 2014"
[76] IBISWorld Industry Report (2013), "Car & Automobile Manufacturing in the US: Market Research Report". p. 5
[77] Tesla Annual Report (2013), p. 32

17% of the total current lithium output[78]. There is a concern that the demand for battery metals will increase to the point at which a shortage of supply will occur. A study by the U.S. Geological Survey (USGS) showed that lithium is the least likely of battery metals to be substituted, because it has the highest charge-to-weight ratio. A supply constraint may therefore have an adverse effect on battery cell production. However, global consumption of battery-grade lithium is estimates to grow at a CAGR of ~134% from 2012 to 2017 and USGS believe that over the next 20 years, mineral production will increase to meet demand[79].

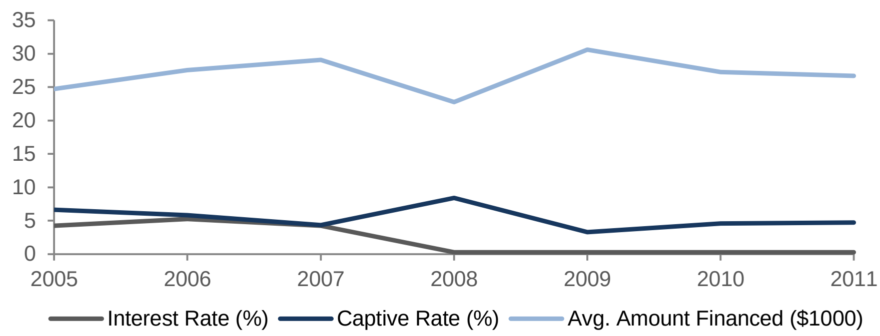
Outlook for other raw material

While commodity prices have declined recently, they are likely to increase slightly in the future, given growing demand. However, as will be described in Porters Five Forces, automakers have relatively high purchasing power over suppliers, and the industry have therefore not experienced major cost peaks except for the a general cost increase in components[80].

3.1.2.4 Interest rates and credit availability

Most cars and vehicles are sold with loans and credits, and the U.S. especially has a deep tradition of buying on credit. Interest rates rise with inflation, and decrease the availability of credit. As a result, interest rates play an important role in the demand for vehicles. When borrowing rates are high, consumers tend to shy away from taking up loans because the price of a car bought on credit rises. Figure 3.5 show the relationship and development in central bank interest rates, captive rates (the interest rate offered by automakers' own financing subsidiaries) and borrowing amounts, between 2005 and 2011. The figure also highlights the effects of the financial crisis in 2008.

Figure 3.5: Interest Rates, Capitive Rates, Amount Financed



Source: Compiled by author / Bloomberg

When interest rates on car loans rose as a result of collapsed credit markets in 2008, credit became more expensive and car sales suffered. As can bee seen from 3.5, interest rates in the U.S. have averaged ~6% from 1971 until 2014, reaching a record low of 0.25% in 2008[81]. One of the catalysts for economic improvement following the crisis is the Federal Reserve Banks's (Fed) quantitative easing program, which

[78] Bloomberg News (28.05.2014)
[79] Goona, G. T. (2012), "Lithium Use in Batteries". p. 1
[80] Ford Annual Report (2013), p. 12
[81] Bloomberg Data (04.05.2014)

has ensured money supply in the economy, and artificially low interest rates (0-0.25%)[82]. These low rates have aided the affordability of automobiles.

Outlook for interest rates

In December 2013, Fed announced that it would begin to gradually cease the quantitative easing program, buying less and less assets as capital markets return to normal[83]. The bond purchasing is expected to end during 2014 and the Fed may raise interest rates shortly after[84]. If interest rates increase, consumers may be less willing to lend which in turn can cause a reduction in sales. Nevertheless, interest rates will continue to be low throughout 2014.

3.1.2.5 Currency exchange rates

Exchange rates play a vital role in the industry's ability to stay competitive. A depreciation of the U.S. dollar will, all else equal, lead to a rise in exports, which is positive for revenue. Tesla continues to expand their operations internationally as part of their growth plan. With operations in foreign countries, risk in terms of foreign currency fluctuations increases. Since part of their revenues and costs are denominated in other currencies, movements relative to the U.S. dollar may harm financial results[85]. If the dollar depreciates, costs will increase and damage margins. As a result of policy changes in Japan, the JPY has depreciated over the last year, adding pressure on vehicle prices globally[86].

3.1.3 Social and environmental drivers

Consumers are becoming more environmentally conscious. This trend is evident in the increasing preference for companies, which can provide them with green choices. According to BCG (2014), connectivity, safety and fuel efficiency are the top three priorities of automobile buyers, and the ability to innovate in these areas will be crucial for success in the next years[87].

3.1.4 Technological drivers

Two significant constraints for consumer adoption of EVs are the battery costs and so-called range anxiety (fear of batteries running out before reaching destination).

3.1.4.1 Batteries

The battery pack is the most technically challenging component of an electric vehicle. Manufacturers want to develop batteries that are safe, can last long and can withstand temperature changes[88]. At the same time they aim for cost reductions. The economics of electric vehicles begin with the batteries, whose costs have been

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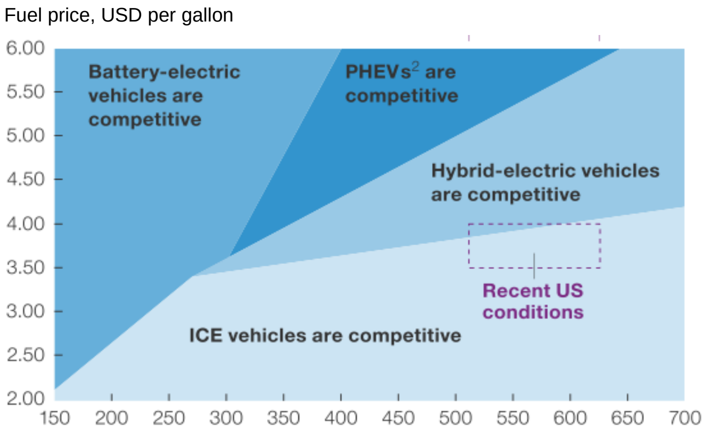
[82] The Federal Reserve System (08.01.2014), "The Federal Reserve´s respose to the financial crisis and actions to foster maximum employment and price stability".
[83] The Federal Reserve System (08.01.2014), "The Federal Reserve´s respose to the financial crisis and actions to foster maximum employment and price stability".
[84] BBC News (20.03.2014), "Federal Reserve hints at interest rate rise in 2015".
[85] Tesla Annual Report (2013), p. 42.
[86] Ford Annual Report (2014), p. 11
[87] Mosquet, X. et al (2014), "Accelerating Innovation: New Challenges for Automakers".
[88] UBS – Tesla Motors, Initiation Coverage (26.03.2014)

declining 6-8 per cent annually[89]. Plug-in electrical vehicles are much more expensive than traditional internal combustion engine vehicles (ICEs) and hybrid vehicles due to the cost of the lithium-ion battery. Reduced battery costs through advances in technology and higher production scale will reduce the initial cost and be crucial in order for EVs to be more competitive. According to McKinsey & Company (2012), the interaction between fuel prices and battery costs will determine the future size of the EV market (figure 3.6). For electric vehicles, battery prices will need to come down to USD 250 per kWh if gas prices remains at the current level (USD 3.50-4.00)[90]. Although the operating cost of an EV is lower than for gasoline driven vehicles, consumers are more sensitive to the initial purchasing price, which is currently too high for mass-market adoption.

Outlook for battery costs

There is a significant variation in the estimates of battery costs, as manufacturers do not disclose pricing details. McKinsey & Co. estimated the price of a complete battery pack to USD 500-600 per kWh in 2012, and expects the level to decrease to about USD 200 per kWh by 2020[91]. Currently, most industry insiders believe that prices is somewhere in the interval of USD 400-750 per kWh. However, governments can help bridge this gap through subsidies. By funding battery research and development, the Department of Energy (DOE) is aiming at USD 300 per kWh in 2015[92] and USD 150 per kWh by 2020[93]. Regardless of the current battery costs, I believe a significant reduction is likely over the next decade due to increased scale and experience as EV volumes expand. However, the capital intensity in the industry limits competition from new innovations and thus the speed of this change relative to other industries.

Figure 3.6: The Interaction of Battery and Fuel Costs



Source: McKinsey & Company

3.1.4.2 Infrastructure

Battery charging infrastructure is a major network externality for the electric vehicle market. For electrical cars to achieve wide-scale global adoption, battery networks must be competitive with existing gasoline fuelling infrastructure in terms of price, range and reliability[94]. Most Americans drive well within the range

[89] McKinsey & Company (2009), "Electrifying Cars: How three industries will evolve".
[90] McKinsey & Company (2012), "Battery Technology Charges Ahead".
[91] McKinsey & Company (2012), "Battery Technology Charges Ahead".
[92] Davis, P. (2012), "Advancing the Development of Electric Vehicles". p. 2
[93] PriceWaterhouseCooper (2013), "State of the Plug-in Electric Vehicle Market".
[94] Becker, A. T. & Sidhu, I. (2009), "Electric Vehicles in the United States: A New Model With Forecasts to 2030". p. 3

for all battery-electric vehicles[95]. Still, range anxiety represents a significant hurdle that producers need to overcome in order to improve the penetration of BEVs. Note that this only applies to battery-electric vehicles and not hybrids, which also run on gasoline. Electric vehicle infrastructure is still in an infant stage. The most significant factor for expanding this infrastructure is a network of charging and battery swapping stations. As the EV market leader, Tesla has the opportunity to shape the infrastructure for the industry as they are developing a network (Superchargers) for their own vehicles. For plug-in vehicles such as Model S and soon to be launched Model X, market expansion depends on building this kind of infrastructure[96]. Charging stations increased to 19,410 in the U.S. in 2013 compared to 541 in 2010, and the DOE aims to further increase the number of charging stations to 22,000 in 2014[97].

3.1.5 Conclusion of External Analysis

The future growth of Tesla, the automotive industry and the adoption of electric vehicles depend on a vast number of external factors. The most significant for the industry as a whole, is economic growth, which affects consumers' ability to purchase vehicles and especially premium models. GDP is expected to grow going forward, with most of this growth coming from Asia. As consumer confidence increases, this will have a positive affect on sales in the premium segment. Oil prices will also increase in the long run as a result of economic growth, driving adoption of EVs. However, this effect will likely be somewhat offset by demand for gasoline driven vehicles from emerging countries. Raw materials are expected to increase slightly over the next years and there is still some uncertainty in regards to the supply of lithium, which is a key input for batteries. A major increase in input prices will hurt manufacturer's margins. Battery prices are the most significant driver of EV adoption, and industry's most crucial constraint going forward. While I expect innovation and learning effects to decrease costs through 2020, these estimates are highly uncertain. The same is true for the infrastructure. Charging infrastructure will need to be expanded in large increments in order to deal with consumer's range anxiety.

3.2 Porters Five Forces

The attractiveness of an industry is a determined by the possibilities of earning a return above the cost of capital. In general, the attractiveness is determined by the competitive landscape. The more intense the competition, the lower are chances of gaining above normal returns[98]. For valuation purposes and for investors it is therefore important to analyse the factors that affect the competition and thus return on investment. Tesla operates in the premium segment, with full focus on electric vehicles (EVs). Most major incumbent automotive manufacturers produce both internal combustion engine vehicles (ICEs) and different powertrain electrification vehicles. In order to analyse the current state of the industry, it is important to

[95] PriceWaterhouseCooper (2013), "State of the Plug-in Electric Vehicle Market".
[96] Booz & Company (2012), "U.S. Automotive Industry Survey and Confidence Index", p. 7
[97] Bloomberg (20.03.2014)
[98] Petersen & Plenborg (2012), Financial Statement Analysis, p. 189

notice that existing manufacturers are facing significant industry-wide changes[99]. The impact of new regulations on vehicle emissions, technological advances and shifting customer trends is driving the industry to evolve in the EV segment. The automotive industry includes traditional ICE vehicles, electric vehicles, plug-in hybrid vehicles and hybrid electric vehicles, and Tesla competes with manufacturers in all segments.

3.2.1 Threat of substitutes

There are various forms of transportation available to consumers such as buses, trains, airplanes and bicycles. Although none of these offers the convenience and flexibility of a car, the geographical location of the customer may make public transportation more preferable. However, while there are alternatives to cars, none of these are direct substitutes.

Based on this, I find the threat of substitutes low.

3.2.2 Threat of new entrants

In order to determine the threat on new entrants, it is necessary to look at the barrier to entry. The ability to enter the automotive industry is determined by capital requirements, economies of scale, technological complexity, distribution network, infrastructure and policies.

The industry is characterized as capital intense, with a high capital-to-labour ratio and large size production capacity[100]. The long product development cycles in the industry involve high initial investments and capital expenditures in continuing projects[101]. As of January 2014, the average CAPEX in the industry was USD 16.8 million[102]. These capital requirements generate significant sunk costs for entrants with no market to offset expenditures. The high investment requirements also make economies of scale crucial to obtain, which is difficult for small players with limited resource.

Most incumbent automakers have developed strong distribution networks through forward integration with dealerships. In many regions, the government also tend to protect national manufacturers because their size (in terms of number of employees, capital size and production output) plays a vital role in the economy as a whole. With the high capital requirements mentioned above, the only way to limit risk for manufacturers and for investors is for the government to commit to the industry. One example is the ~25% import tax the Chinese government imposes on foreign companies[103].

[99] Tesla Motors – Investor Relations
[100] Beltramello, A. (2012), "Market Development for Green Cars",
[101] Audi AG Annual Report (2013), p. 200
[102] Damodaran, A. (2014), Dataset – Capital Expenditures by Sector
[103] International Business Times (31.07.2013), $724,000 For a Ferrari? China´s Rich Are Getting Shafted Buing Luxury Cars, But Who´s Ripping Them Off".

Branding can help offset part of this entry risk. In the premium segment, brand equity accounts for a significant entry barrier, since the reputation of the brand is important for customers. Brand recognition and perception of quality matters more for luxury manufacturers, and is extremely difficult for new entrants to match.

I conclude that the threat of entry is low, and even lower in the premium segment.

3.2.3 Bargaining power of customers

The degree to which customers have bargaining power, depend on their sensitivity to prices and relative bargaining power[104]. Buyers in the industry are end costumers and consist of households and businesses.

Private household consumers are the main source of profit generations, and these are highly sensitive to prices. Due to this sensitivity, automakers are unable to offset a lager increase in costs, and have to sell at a low profit to reduce inventory[105]. To offset this effect, manufacturers invest heavily in brand building in order to weaken the bargaining power of customers. On the other hand, customers in the premium segment are less price-sensitive. As a result, profit margins are higher and manufacturers are less exposed to economic cyclicality. This is evident from the higher and more stable margins earned by Audi and BMW compared to the other companies in the peer group[106].

The industry is characterized by a large sales volume, (~76 million in 2013), and a large number of costumers. The high number of players in the market reduces buyer power as they have limited relative bargaining power.

A third way to analyse customer power, is to determine their ability to vertically integrate into the industry[107]. Due to the high number of customers and the vast amount of resources needed to produce vehicles, the risk of backward integration is more or less non-existing.

I conclude that the bargaining power of buyers is moderate and slightly lower in the premium segment.

3.2.4 Bargaining power of suppliers

The automotive industry has a supply chain structure divided in “tires”. In order to determine the power of suppliers, I will discuss the most critical suppliers: raw material and Tier 1[108].

[104] Grant, R. M (2010), Contemporary Stratetegic Analysis, 7th edition, p. 76
[105] Automotive World (2011), ”Purchasing: the impact of rising and volatile raw material prices”, p. 2
[106] Appendix 4.3 – Common-size analysis of income statement.
[107] Grant, R. M (2010), Contemporary Stratetegic Snalysis, 7th edition, p. 77
[108] Automotive World (2011), ”Purchasing: the impact of rising and volatile raw material prices”

Tier 1 suppliers mainly focus on exterior, interior, body, powertrain, electrical or chassis[109]. Most Tier 1 suppliers are auto-specific and rely on a low number of customers. This dependency put them in a bargaining disadvantage. Their financial performance vary in terms of region, product focus and business model, and may indicate different degrees on bargaining power. According to Roland Berger (2013), suppliers focused on chassis and powertrain have relatively strong margins, indicating the relative importance of these suppliers[110].

In the premium segment, manufacturers require higher-quality materials. Since only a limited number of suppliers are able to deliver exclusive materials, premium manufacturers have higher switching costs relative to mass-market competitors. However, the relationship works both ways, as premium manufacturers demand more differentiated inputs from suppliers.

The competitive landscape for suppliers of *raw materials* is fragmented and most suppliers sell to a large number of manufacturers in various industries. This means that volumes are critical for profitability, but also that OEMs (Original Equipment Manufacturers) only contribute to a fraction of total revenues. This strengthens supplier power. However, manufacturers rely on a highly diverse distribution channel, and thus can threaten to cut volumes. This reduces the bargaining power of a single supplier.

Key inputs include commodities such as nickel, steel, copper, aluminium and lithium. Raw materials offer limited differentiation, and suppliers are rather homogenous. Fluctuations in raw material prices have significant impact on margins, as manufacturers cannot charge higher prices to offset increased cost (due to the price sensitivity of the end consumer). When raw material costs doubled leading up to 2008, manufacturers exploited their bargaining power to limit suppliers' ability to increase prices[111].

I conclude that the bargaining power of suppliers is moderate.

3.2.5 Intensity of existing rivalry

Competition in the automotive industry is intense and evolving with rising material costs, price pressure and stricter environmental regulation, forcing automakers to reduce costs and invest in alternative fuel in order to stay competitive[112]. In developed countries, the automotive market is in a mature stage, putting pressure on manufacturers to capture market shares with new innovations. In emerging countries, rivalry is somewhat

[109] PwC (2013), "North American Automotive Supplier: Supply Chain Performance Study". p. 2
[110] Roland Berger (2013), "Global Automotive Supplier Study", p. 10
[111] McKinsey & Company (2012), "The Future of The North American Automotive Supplier Industry". p. 14
[112] Beltramello, A. (2012), "Market Development for Green Cars".

weaker due to the relative size and a growing market. On the global market, there are around 35 companies, with 22 based in Asia[113].

While the ICE segment has reached the maturity stage, entrenched automakers are investing more seriously in EVs and competing to establish industry standards. With increasing pressure on companies to innovate, competition is likely to be more intense going forward.

By using the Herfindahl-Hirschman Index, which is a measure of market concentration, I find the concentration in the automotive industry to be ~726[114]. According to the U.S. Department of Justice, this classifies the market as concentrated and therefore highly competitive[115].

I conclude that the intensity of existing rivalry is high.

3.2.6 Conclusion of Porter's Five Forces

The Five Forces analysis aimed at determining the degree to which specific factors affect industry profitability. My findings are that the capital intensity of the industry limits the threat from new entrants, and also pressure players to achieve critical scale. Buyer and supplier have only limited bargaining power as they are highly dependent on the industry. Intense competition is the most significant limitation for industry profitability, and the maturity of the industry leaves few possibilities for capturing market shares.

3.2.7 Market outlook for the automotive industry

Porter's Five Forces provide an implication of the profitability of the industry. However, it fails to indicate how these mechanisms will play out over time[116].

In the industry analysis, I identified that the automotive industry is in a mature stage of the industry life-lifecycle. This stage is characterized by factors such as intense rivalry, high barriers, requirements for technical expertise, and a controlled distribution network. Due to high sunk costs, exit barriers are high. Few companies are therefore likely to leave the industry.

Due to the sensitivity to economic cycles, I expect automakers to diversify their product portfolio and enter new markets. The innovation in the electrical vehicle segment is a result of such diversification. There are several large players in the industry, and therefore difficult for any company to increase market shares. From Appendix 3.2, it can be seen that the ten largest players in the industry have maintained the same market share since 2003. Given the tightening of environmental regulations and the focus on reducing oil

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[113] Bloomberg Data
[114] HHI = $\sum_{i=0}^{N} s_i^2$
[115] U.S. Department of Justice and the Federal Trade Commission (2010), "Horizontal Merger Guiideline", p. 18
[116] Sørensen, O. (2012), Regnskabsanalyse og Værdiansættelse, p. 77

dependency, diverse powertrains will take a larger place in the market. Although this may cause some structural changes, changes are likely to come from existing players given the high entry barriers. Changes will also evolve over a long period of time, due to the high capital investments required for growth.

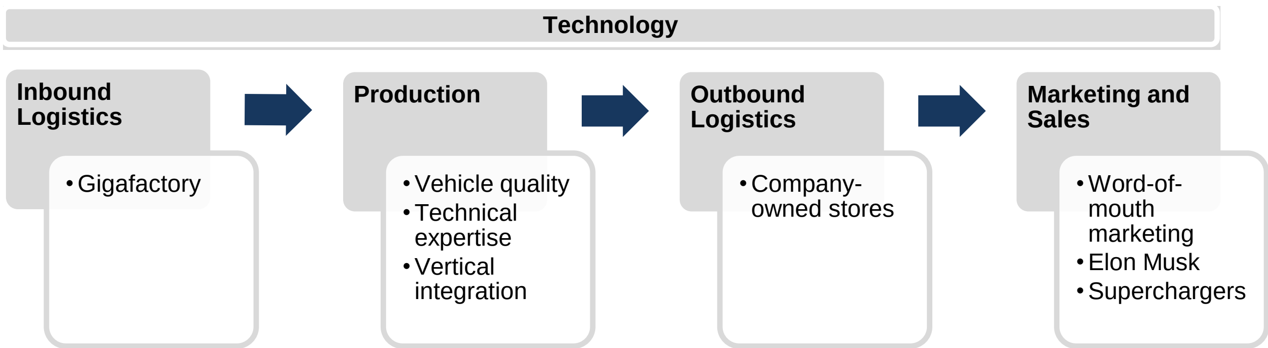
3.3 Internal Analysis

3.3.1 Value chain analysis

Up until this section, I have analysed the macroeconomic factors and the competitive environment affecting the automotive industry. In this section, I will analyse Tesla's internal resources and capabilities and assess how these are exploited to generate returns to shareholders. Critical resources and capabilities are recognized with the use of a value chain analysis. After assessing each step, I will make use of the VRIO model to determine potential competitive advantages and identify sustainable competitive advantages[117].

Tesla strives to create superior products and use proprietary technology to differentiate their brand. Core competencies are expressed through the activities in their value chain, which creates customer value. The analysis will follow the structure of Porters Value Chain where activities are separated depending on whether they are primary or supportive. As I have exclusively based my analysis on publicly available information, I do not have sufficient information to assess all internal processes. In the process of filtering available information, I have focused on actual value creation. Therefore, only Tesla's core competencies are analysed.

Figure 3.7: Tesla's Value Chain



Tesla has taken an innovative approach to the traditional OEM business model. The company has integrated most parts of their value chain, including design, manufacturing and sales. All of these functions are controlled under the Tesla brand. This vertically integrated model contributes to costs reduction and control over the quality of their products. Tesla develops the powertrain at their factory in California and sources

[117] Barney, Jay B. and Hesterly, William S. (2012), Strategic management and competitive advantage, 4th ed., p. 68

battery cells, which is the key input, from Panasonic[118]. The integrated distribution system includes company-owned stores and online sales, which is unlike traditional OEMs who distribute vehicles through local dealerships. Tesla operates in the premium segment and is pursuing a differentiation strategy. They are able to charge a premium price, because perceptions about quality, powertrain reliability and design are important for customers. In the value chain analysis, I will focus on how Tesla creates value for customers in each step of the value chain.

3.3.1.5 Support activities - Technology

Powertrain and battery pack technology

Tesla has 203 patents and 280 patents pending[119]. Most of these patents revolve around the battery and electric powertrain components, which is the most important component of the vehicle. The battery pack is Tesla's core competence. It is designed to allow flexibility with regards to battery cell chemistry, form and vendor in order to adapt to future advancements. As a result, Tesla will be able to optimize their battery pack as battery cells improve in energy storage, capacity and cost per kWh[120].

The company has developed an extensive technology portfolio that may help them bring lower-priced vehicles to the market (ref. Gen 3). This is an important technological advantage and a competitive advantage that position the company for future growth. Tesla has invested a vast amount of resources in innovation. As I will elaborate on in the financial analysis, Tesla spent 12% of revenues on R&D in 2013, while premium peers spent on average 4%[121]. It is difficult to quantify the financial return on this technology besides from the performance of the vehicles. In the annual report for 2013, Tesla comment on their technology and batteries[122] [123]:

Our proprietary technology includes cooling systems, safety systems, charge balancing systems, battery engineering for vibration and environmental durability, customized motor design and the software and electronics management systems… These technology innovations have resulted in an extensive intellectual property portfolio… We believe one of our core competencies is the design of our complete battery pack system… We believe our ability to change battery cell chemistries and vendors while retaining our existing investments… will enable us to quickly deploy various battery cells into our products and leverage the latest advancements in battery cell technology.

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[118] teslamotors.com, press release, 11.10.2011
[119] Tesla Annual Report (2013), p. 5
[120] Tesla Annual Report (2013), p. 9
[121] Appendix 4.3 – Common-size analysis of income statement
[122] Tesla Annual Report (2013), p. 5
[123] Tesla Annual Report (2013), p. 8-9

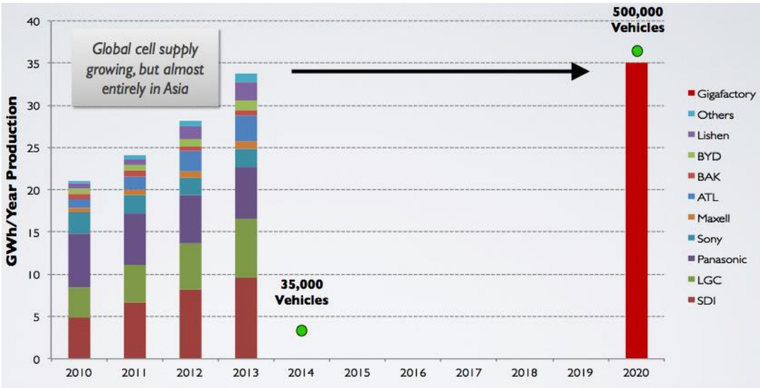
As mentioned in the introduction, the high price of EVs compared to ICEs is to a large extent explained by the battery cost. Most manufacturers seek to reduce the cost by minimizing the size of the battery. As a result, most EVs have only a limited range. By acknowledging that there is a market for premium EVs, Tesla has taken the opposite strategy: 85 kWh battery pack and the longest range in the industry (ref. table 2.1).

Tesla's core capability is their powertrain and battery pack technology. This is the single most valuable strategic factor and is highly rare. Imitating this capability is costly and demands high technical expertise. The company is organized to capture value by using the technology for their own vehicles as well as selling powertrain components to other manufacturers. If the Gigafactory is successful, they will be able to capture even more value. I therefore conclude that the powertrain and battery pack technology is a sustainable competitive advantage. Tesla also has a cost advantage in producing battery packs. However, competition and technology advancements will likely eliminate this advantage over the long run.

3.3.1.1 Inbound logistics

The Gigafactory

Picture 3.1: Planned Gigafactory Production Exceeds 2013 Global Production



Source: teslamotors.com

Tesla currently sources battery cells from Panasonic, who has agreed to supply cells for Model S and Model X. In an attempt to push down battery costs and secure the supply of battery cells for Gen 3, Tesla has announced their plans to build a battery factory with the capacity to produce more batteries than the total world output in 2013 (picture 3.1). With the Gigafactory, the entire battery pack production will be vertically integrated. This will create significant scale advantages and allow Tesla to build the Gen 3 with a 200 miles range and half the price of the Model S[124].

In collaboration with battery manufacturing partners, including Panasonic, Tesla plan to build a factory to achieve scale and minimize costs through manufacturing, less logistics waste, optimization of processes and reduced overhead. The plan is to begin construction during 2014 with production starting in 2017. Musk expects the factory to supply battery cells for 500,000 vehicles annually and reduce the current battery cost by 30%[125]. Tesla could potentially become the worlds leading producer of lithium-ion batteries.

[124] Tesla Motors – Gigafactory Presentations
[125] Tesla Annual Report (2014), p. 14

The Gigafactory has the potential to be a sustainable competitive advantage while also creating a new source of revenue. However, the true value of this project is still unknown.

3.3.1.2 Production

Manufacturing at the Fremont factory

Tesla's proprietary technology makes the components of the Model S difficult to source from suppliers. As a result, the company has adapted an integrated production strategy where design, engineering and assembly are handled in-house. This includes the aluminium body and chassis stamping, interior, heating and cooling and electrical systems. Components are designed to be light in weights to reduce the load on the battery pack, thereby extending the driving range[126].

All vehicle manufacturing is carried out at the Fremont factory in California, which has a capacity of 500,000 vehicles per year. The plant has been redesigned from scratch to maximize flexibility and adaptability in manufacturing. Instead of using heavy equipment, Tesla uses automated vehicles and robots to move the cars and components around the factory. This has reduced overhead need, and made the manufacturing process leaner and more cost efficient. Additionally, the design and engineering team are placed in the same location, which, according to Tesla, enables faster processes, better products and reduction of logistics waste. The location was strategically chosen to be close to technical expertise and engineering labour in Palo Alto, California[127].

The flexible manufacturing process and the high-technology composition of the Fremont factory is rare among auto companies. Tesla is the only company with a plant built entirely for electric vehicles. The company has the opportunity to maintain an advantage in EV manufacturing in the short-term as construction time and technical know-how (as mentioned in the industry analysis) will make competitors lag a few years behind. Thus, the Fremont plant is a temporary competitive advantage.

3.3.1.3 Outbound logistics

Company-owned stores

Tesla has pursued an integrated distribution model, which is different from the traditional dealership model. The company has spent large amounts of capital to expand the network of stores and service centres globally, and incurs high expenses related to operating them. As I will explain in detail in the financial analysis, Tesla spent significantly more than peers on sales, general and administrative (SG&A) in 2013. These expenses are mainly related to headcount to support their stores and the supercharging network[128]. However, Tesla may in the long run be able to capture more margins. The rationale for this business model is that for existing

[126] Tesla Annual Report (2013), p. 10
[127] Tesla Annual Report (2013), p. 5
[128] Tesla Annual Report (2013), p. 80

dealerships, there is a conflict of interest between selling gasoline driven cars and electric cars. Explaining the advantages of one will undermine the other[129]. Tesla's stores are located in visible venues such as malls and shopping streets to reach customers when they are open-minded. The stores carry no inventory and are solely designed to be informative. Brand perception is extremely important for Tesla, and with integrated stores, Tesla controls the entire customer experience.

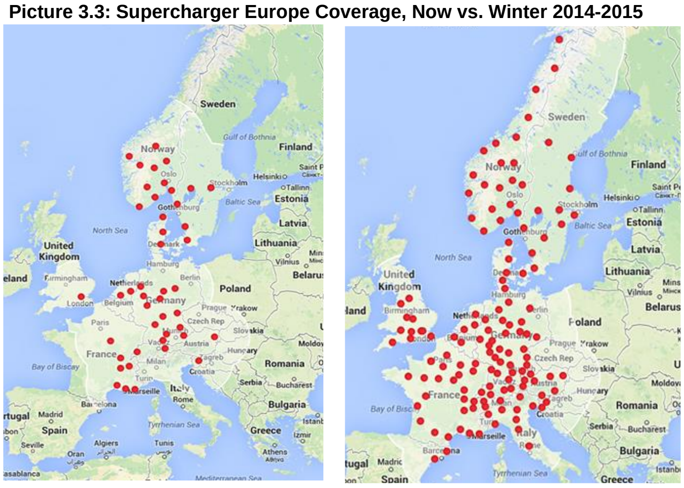
Based on the analysis, I find that Tesla's stores and service centres are valuable for the company, in order to educate customers and maintain a good brand perception. It is also rare, as Tesla is the only auto company who has adopted a vertically integrated distribution model. The relatively high SG&A expenses, highlights that this resource is costly, but not impossible to imitate. In such, the stores provide a temporary competitive advantage.

3.3.1.4 Marketing and sales

Supercharger network

Tesla's superchargers are on average, 16 times faster than public charging stations and the company currently have 110 stations in North America and Europe and has recently opened their first station in China. By the end of 2014, they plan to cover 98% of the U.S. population[130]. Faster charging and convenience of the superchargers, gives Tesla a competitive advantage. While it will take time for competitors to build a similar network, it can be imitated. Picture 3.3 shows the current supercharger coverage in Europe, versus the expected coverage in late 2014-2015, highlighting the pace at which the company is building infrastructure.

Picture 3.3: Supercharger Europe Coverage, Now vs. Winter 2014-2015



Source: teslamotors.com

I conclude that Tesla's Superharger network is a temporary competitive advantage.

Brand and the CEO

Automotive costumers are relatively loyal, as long as brands are perceived as reliable in terms of quality, design and price. For premium brands, customers are more loyal, and companies invest accordingly more in marketing to exploit the revenue potential. From 2010 to 2013, premium peers i.e. BMW and Audi, spent on average 5% of revenues on marketing and sales, whereas Tesla spent only 1% during the same period[131].

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129 Tesla Motors, Blog Post – Tesla´s Approach to Distributing and Servicing Cars
130 Tesla Motors, Blog Post – 100 Supercharger Stations
131 Appendix 4.3 – Common-size analysis of income statement

Tesla's brand represents attributes of luxury, modern technology and environmental consciousness. Customers have also attached a "coolness" factor to the company, the products and to Elon Musk himself. Few CEOs in the industry have the same track record and knowledge of alternative energy[132]. With superior performance, the company has established a strong brand and was voted car of the year by Consumer Reports in 2013[133]. By building a car that exceeds expectations, Musk knows that customers who buy a Model S become a sales person to a community of like-minded people[134]. Instead of relying on traditional advertising, Tesla relies on word-of-mouth and media coverage[135].

Elon Musk and customer advocates are valuable for the company and rare in an industry were switching costs and brand loyalty is relatively low[136]. While competitors may change brand perceptions by introducing new models, Elon Musk is not imitable. I conclude that Tesla's marketing strategy is a temporary competitive advantage while Elon Musk is sustainable competitive advantage.

3.3.1.7 Conclusion of internal strategic analysis

Based on the value chain analysis, I have identified Tesla's most valuable resources and capabilities. With use of the VRIO-model, I assessed the competitive implication of each factor. The findings from the internal analysis are summarized in table 3.2.

Table 3.2: Summary of Internal Strategic Analysis

Resource / Capability	Valuable	Rare	Imitable	Exploited	Competitve Implication
Battery pack & powertrain technology	Yes	Yes	Unlikely	Yes	Sustainable competitive advantage
Cost of battery pack	Yes	Yes	Only in the long-run	Yes	Temporary competitive advantage
The Gigafactory	Potentially	Yes	Unlikely	Not yet	Potential sustainable competitive advantage
Manufacturing	Yes	Yes	Only in the long-run	Yes	Temporary competitive advantage
Company-owned stores	Yes	Yes	Only in the long-run	Yes	Temporary competitive advantage
Supercharger network	Yes	Yes	Only in the long-run	Yes	Temporary competitive advantage
Brand	Yes	Yes	Only in the long-run	Yes	Temporary competitive advantage
Elon Musk	Yes	Yes	Unlikely	Yes	Sustainable competitive advantage

132 Appendix 1.1 – Management Team
133 Consumer Reports (February 2014)
134 Agassi, S. (18.08.2013), "Tesla's a Threat to the Auto Industry, But Detroit's Reacting All Wrong"
135 Tesla Annual Report (2013), p. 12
136 See Portes´s Five Forces Analysis.

4.0 Financial Statement Analysis

In order to understand Tesla's financial position and to forecast cash flows, it is vital to assess the historical development and performance. By analysing previous financial statements, it can be seen how Tesla has created value and how the company has performed relative to peers. As shown in figure 1.1, Tesla's stock price has been highly volatile since 2013. From the financial year of 2012 to 2013, revenues increased ~500%, and the stock price followed on from a price of USD 37.9 in March 2013, to USD 208.5 in March 2014. This growth pattern hampers the estimation of future cash flows based on historical performance. However, as earlier discussed, Tesla operates in a mature industry with established manufacturers. I therefore believe that growth can be projected and verified by analysing the historical development of Tesla and industry peers.

Tesla's financial performance will be compared and benchmarked against a selected group of peers, based on operational criteria's and market (Appendix 4.1). The analysis is based on annual reports from 2009 to Q1 2014. Due to high growth rate, I find it useful to also look at results from the first quarter of 2014. For the same reason, it is impractical to go further back is time. There is a significant degree of seasonality in vehicle sales, causing fluctuations in sales from quarter to quarter. Therefore, I have exclusively benchmarked Tesla with peers in the period from 2010 to 2013.

4.1 Reorganizing Financial Statements

In this section I will explain the process of reformulating the income statement and balance sheet for analytical purposes and the assumptions taken to arrive at key performance measures. I will reorganize Tesla's financial statements by separating operating items from non-operating items and interest bearing assets from interest bearing liabilities. Finally, I will analyse essential ratios that will be used in combination with the strategic analysis to forecast cash flows. All statements and details on the reorganization of peers' financial statements can be found in Appendix 4.2.

4.1.1 The analytical income statement

Operating income is an important measure of performance, and shows the firm's result from core activities without accounting for the choice of financing[137]. In order to analyse Tesla's core operations and compare it to peers, I have classified all items according to how they relate to the core business. This has led me to calculate their operating earnings in terms of EBITDA, EBIT and NOPAT[138]. I have reviewed certain questionable items of the income statement:

- *Other income (expense) net* in 2013 was significantly higher than in previous years, as a result of the repayment of all outstanding principal and interest under the DOE loan facility. In such, the change in

[137] Plenborg & Petersen (2012), Financial Statement Analysis, p. 73.
[138] EBITDA = Earnings before interest, tax, depreciation and amortization, EBIT = Earnings before interest and tax, NOPAT = Net operating profit after tax

fair value of the warrant of USD 10.7 million was recognized in other income. Other income also contributed to profits in 2013, due to the realization of a favourable currency swap related to the Japanese yen[139]. The depreciation in JPY was discussed in the external analysis.

- *Interest expenses* in 2013 deviated from previous years, as a result of the extinguishment of the Department of Energy (DOE) loan facility were all issuance costs were written off to interest expense[140]. The DOE loan granted in 2010 came with very low interest rates but at the costs of certain financial covenants, which, according to Tesla restrained them from pursuing certain aspects of their business plan. Interest expenses are a recurring item, but since the extinguishment of the DOE loan was a one-time event, expenses will likely be lower in the future. Due to the lack of details regarding the segregation of this item, I have not made further changes.

After assessing the income statement for the above-mentioned items, I have chosen to make changes in the setup to increase the level of details and make it easier to calculate key ratios.

- Revenue: In order to analyse the key value drivers, I have separated revenue based on the source of income and geographic segment.
- EBITDA: Tesla does not report EBITDA on their income statement, as this is not a requirement under U.S. GAAP. Since I want to use this measure in relation to the valuation, I have calculated EBITDA.
- Depreciation and amortization (D&A) is recorded in cost of automotive sales. To determine EBITDA, I have therefore excluded D&A from cost of automotive sales, and added it to operating income (EBIT) for each year. This gives a higher than reported gross profit and an unchanged net income.
- NOPAT: The result from operating and financial activities both have consequences for taxes. In the official income statement, only provision for income taxes is reported. I have calculated operating income after tax (NOPAT), by determining the effective tax rate and allocating it between operational (NOPAT) and financial items[141]. I have done this by calculating the tax shield on net financial expenses.

Lastly, I have chosen not to capitalize research and development, although it can be argued that Tesla's high R&D expenses results in an understated invested capital and overstated ROIC[142]. However, by separating R&D expenses from operating expenses for companies in the peer group, I believe the companies can be compared.

[139] Tesla Annual Report (2014), p. 82
[140] Tesla Annual Report (2014), p. 106
[141] Plenborg & Petersen (2012), Financial Statement Analysis, p. 68
[142] Koller, T. Goedhart, M. And Wessels, D. (2010), Valuation, p. 160

4.1.2 The analytical balance sheet

To determine the company's ability to make profit, it is necessary to reorganize the official balance sheet to identify the two drivers of profitability: operational activities and financial activities[143]. I have categorized assets and liabilities as either operating or financial, and calculated invested capital by deducting total operating liabilities from operating assets. Invested capital is the assets financed by shareholders (equity) and lenders (debt), and equals the sum of total equity and NIBD (net interest bearing debt)[144].

I have examined each balance sheet item and categorized them based on whether or not I see it as related to core operations or financing. I have reviewed certain questionable items:

- *Other (non-current) assets* include emission permits related to the operations of the Tesla Factory, debt issuance costs and loan facility issuance costs[145]. Debt issuance costs include underwriting, legal and administrative fees for issuing debt. I do not have access to further information, but deems that these assets are not interest bearing. I have therefore categorized other assets as operational.
- *Operating Lease Vehicle, Net.* Tesla offers a resale value guarantee where customers have the option of reselling their vehicle back after three years, for a pre-determined price. The initial purchases price less the resale value (operating lease vehicle) is recognized in automotive sales. If the customer decides not to sell their vehicle back after three years, the operating lease vehicle value is recognized in automotive sales[146]. However, if Tesla takes the car back, there is a risk that they may not be able to resell the car at the amount they recognized as revenues. Any amount less is a loss, and will be reflected as a decrease in revenues over the next year. Operating lease vehicles is therefore considered a part of the company's operations.
- *Reservation payments* for Model X and *customer deposits* for Model S both refer to prepayments of vehicles, which is an important part of Tesla's business model. Since these prepayments are later reflected in operating profits[147] and a part of the on-going operations, it is classified as an operating liability.
- *Resale value guarantee* is a new program in 2013 offered to customers who purchase the Model S. Customers are given the option to sell back the vehicle within a certain time limit at a pre-determined resale value. The resale value guarantee directly affects revenues, and have therefore been categorized an operating liability.
- *Cash and cash equivalents* are excess cash invested in securities or treasury stock, used to repay debt or to pay out dividends. The separation between cash used for such activities and cash used for on-going

143 Sørensen, O. (2012), Regnskabsanalyse of værdiansættelse, p. 158
144 NIBD = Financial liabilities – Financial assets.
145 Tesla Annual Report (2013)
146 Tesla Annual Report (2014), p. 67
147 Plenborg & Petersen (2012), Financial Statement Analysis, p. 77

operation are not mentioned in the annual report. I have classified the item as a financial asset, since failing to exclude the item from operating assets will depress ROIC[148].

Based on the reformulated financial statements for Tesla and peers, I have arrived at EBITDA, NOPAT, invested capital and net interest bearing debt. These measures will in the following section be used to calculate several key ratios.

4.2 Historical Performance and Growth

In order to analyse the key drivers of Tesla's performance and growth, financial performance are benchmarked against peers. This will provide a better indication of the financial situation and the relative performance of Tesla. This section will follow the structure of the DuPont model created by Petersen & Plenborg (2012)[149]. All balance sheet items included in the ratios are based on average numbers. Therefore balance sheet ratios are analyzed from the period 2010 to 2013, where 2010 measures the average of 2009 and 2010. The most important measure of profitability for shareholders is the return on equity (ROE). ROE captures the result of both operational and financial decisions, which I will illustrate by decomposing the ratio into return on invested capital (ROIC) financial gearing and spread. In such the effect of financial gearing is isolated to view its impact on the return to shareholders[150]. In order to evaluate Tesla's financial performance and development, I will make use of indexing and common-size analyses for benchmarking. The analysis will help to identify value drivers and operational areas with improvement potential.

Before assessing Tesla's financial ratios in a cross-sectional analysis with peers, it is again important to mention, that companies in the early stage of their lifecycle are not directly comparable to other companies in the industry[151]. However, historical performance of mature companies provides valuable information about Tesla's future earnings potential. Furthermore, in the assessment of the company's performance over time, the main focus will be on growth and performance in the last two years, as I believe this provides a better indication of future earnings potential.

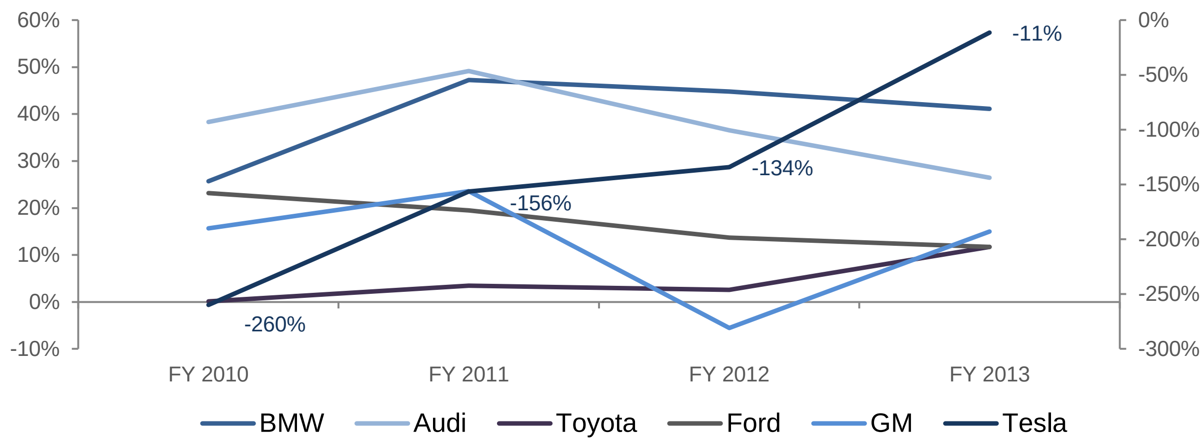
4.2.1 Operational Performance – Decomposed ROIC

In the comparison with the peer group, ROIC is calculated before tax, due to the high variation in effective tax rates between years and between the companies. While this will overstate ROIC, it provides a more comparable measure. Figure 4.1 illustrates the historical development of ROIC for the period 2010 until 2013.

[148] Koller, T. Goedhart, M. And Wessels, D. (2010), Valuation, p. 143
[149] Appendix 4.3
[150] Petersen & Plenborg (2012), Financial Statement Analysis, p. 117
[151] Petersen & Plenborg (2012), Financial Statement Analysis, p. 106

From 2010 to 2013 Tesla has experienced significant operating losses, albeit a steep growth. The upward trend from 2012 until 2013 is to a vide extent a result of the launch of Model S, which has contributed to an increase in year-over-year vehicle sales of ~460%. Furthermore, the company has experienced growth in other business areas and geographical segments, as discussed in section 2.6 and 2.7. Over the period, Tesla has expanded production to keep up with demand. However, compared to the estimated WACC from chapter 7 of 8.12%, Tesla has not delivered satisfying returns.

Figure 4.1: ROIC, Peers (L) and Tesla (R)



Source: Author / Company Reports

Tesla has historically had a negative ROIC, and their ability to create value for shareholders is significantly poorer than peers. GM and Toyota showed a slight improvement in 2013, while BMW, Audi and Ford experienced a decrease in profitability. The slump in GM's profitability in 2012 was primarily an effect of increased costs of revenues. According to their annual statement, this was partially caused by an unfavourable vehicle mix, as consumers favoured smaller and cheaper vehicles. Furthermore, GM experienced higher pension and labour expenses compared to previous years[152]. The slight improvement in Toyota's ROIC during the fiscal year of 2013 was a reflection of favourable currency exchanged rates between JPY and USD, as mentioned in the strategic analysis. A weaker yen relative to the U.S. dollar gave Toyota and export advantage and improved their competitive advantage relative to U.S. automakers. In extension, Toyota was able to return more capital to their investors[153]. Audi and BMW have consequently outperformed the other companies over the period, which can be explained by their presence in the premium segment. However, the economic contraction in Europe had adverse effects on the industry, which to some extent explain the downward trend in ROIC for BMW and Audi since 2011. While the profitability of the industry has followed the cyclicality of the economy, Tesla's ROIC has grown rapidly. In order to fully

[152] General Montors Annual Report (2012), p. 30
[153] Mattera, S. (07.08.2013), "Why You Should Buy Toyota, and Not Tesla".

understand the drivers behind Tesla's improved, but negative performance, I have broken down ROIC in profit margin and turnover on invested capital.

4.2.2 Profit Margin

Profit margin (EBITDA) illustrates the result from core operations as a percentage of revenues, and shows a company's ability to generate profits after covering all operating expenses. Profit margin can be improved through higher revenues or lower costs i.e. increased efficiency. In the following, I will analyse each component separately.

Development of revenues

Since Tesla's first financial year as a public company, revenues have grown at a compounded annual growth rate (CAGR) of 158%. The company has experience a net operating loss in every year. In 2013, margins significantly improved as the company grew sales by ~387% from the previous year. In order to identify the significant drivers of profit margin, I have conducted a common-size analysis of the income statement.

Table 4.1: Common-Size of Income Statement	FY 2010	FY 2011	FY 2012	FY 2013
Total Revenues	**100 %**	**100 %**	**100 %**	**100 %**
Automotive sales	83 %	73 %	93 %	99 %
Vehicle Sales	*62 %*	*48 %*	*76 %*	*87 %*
Emission credits	*2 %*	*1 %*	*10 %*	*10 %*
Sale of powertrain components	*19 %*	*23 %*	*8 %*	*2 %*
Development Services	17 %	27 %	7 %	1 %
Depreciation	-14 %	-13 %	-8 %	-7 %
Gross Profit, adjusted	**35 %**	**38 %**	**14 %**	**28 %**
Research and development	-80 %	-102 %	-66 %	-12 %
Selling, general and administrative	-72 %	-51 %	-36 %	-14 %
EBITDA	**-117 %**	**-115 %**	**-88 %**	**2 %**
Depreciation	-9 %	-8 %	-7 %	-5 %
EBIT	**-126 %**	**-123 %**	**-95 %**	**-3 %**

The relative contribution of each business segment is shown in table 4.1. It is evident that vehicle sales have historically been the key revenue driver. Development services contributed with 27% revenues in 2011, but revenues from this segment have declined, and contributed only 1% in 2013. Both sales of powertrain components and development service have been falling over the years. As mentioned in section 2.6.1, revenue from sales of powertrain components and development services has been generated by Tesla's contracts with Daimler and Toyota. The company has not announced any new agreements, and it is therefore unlikely that these revenue streams are sustainable. Emission credits contributed nearly 10% to revenues in 2013, which was an important factor for achieving positive EBITDA. Without revenue from this segment, margins would have been negative. Going forward, I expect vehicle sales to account for the majority of profits. Gross profits doubled from 2012 to 2013, while expenses related to research and development and selling, general and administrative was significantly reduced. This positive trend resulted in a positive EBITDA-margin in 2013.

After establishing that Tesla, over the analysed period, has successfully expanded revenues while simultaneously increasing margins, I find it necessary to benchmark the company's cost structure. Tesla is a growing company, and their financial performance will develop rapidly over the next years. A benchmark analysis will therefore provide valuable insight to how Tesla's financials develop. I have decomposed the essential cost items based on information from annual reports. For peers, ratios are based on the average from 2010 through 2013.

Table 4.2: Common-Size and Benchmark of Income Statement

FY 2010	FY 2011	FY 2012	FY 2013	Tesla (R) and Peers (L)	GM	Ford	Toyota	BMW	Audi
65%	62 %	86 %	72 %	COGS	78 %	81 %	80 %	69 %	71 %
N/A	N/A	N/A	N/A	- Materials/commodities	52 %	54 %	N/A	59 %	63 %
3 %	2 %	2 %	3 %	- Warranty	N/A	-2 %	N/A	2 %	N/A
0 %	0 %	0 %	0 %	- Pension & OPEB	2 %	1 %	N/A	1 %	0 %
80 %	102 %	66 %	12 %	R&D	5 %	4 %	4 %	6 %	1 %
72 %	51 %	36 %	14 %	SG&A	8 %	7 %	10 %	9 %	10 %
3 %	2 %	1 %	0 %	- Advertising and sales	4 %	3 %	2 %	7 %	9 %
70 %	49 %	36 %	14 %	- Administrative and other	5 %	4 %	8 %	3 %	1 %
-117 %	-115 %	-88 %	2 %	EBITDA	9 %	8 %	7 %	16 %	16 %
9 %	8 %	7 %	5 %	D&A	5 %	3 %	5 %	6 %	5 %
-126 %	-123 %	-95 %	-3 %	EBIT	3 %	5 %	2 %	10 %	11 %

Variable costs: Cost of goods sold

In the strategic analysis, I discussed how the volatility in commodity prices is a significant risk factor in the industry. While only BMW and Audi report exact values, GM and Ford mention in the annual report that material costs accounts for about two thirds of cost of revenues (COGS). Material costs for these two companies are therefore based on own estimations.

As can be seen from table 4.2, Tesla has historically operated with relatively low COGS (with exception of 2012). This is partially a result of centralized manufacturing[154], low headcount and lower battery costs relative to peers, which was pointed out in the value chain analysis. The decrease in gross margin from 2011 to 2012 is a reflection of the lower margins on Model S relative to the low volume/high price Roadster, which ended production in 2011. Gross profit increased significantly from 14% in 2012 to 28% in 2013, implying that revenue grew faster than cost of revenues. The high COGS in 2012, was mainly caused by cost

[154] Headquarter and manufacturing is located in close proximity in California.

inefficiencies during the production ramp-up of Model S and high material prices[155]. As a result of increased manufacturing efficiency, sales growth and lower material costs, Tesla has been able to improve gross margin and obtained a margin in line with premium manufacturers (represented by BMW and Audi) in 2013.

Fixed costs

Tesla's operating expenses decreased from 2010-2013, as can be seen from table 4.1. As mentioned in the value chain analysis, production ramp-up and expansion of stores and service centres are the main drivers of operating expenses. Research and development (R&D) and sales, general and administrative expenses (SG&A) decreased over the year.

Research and Development expenses have remained at a steady rate among pees over the period. For peers, R&D accounted for on average 7-10% of revenues, while Tesla reported 12% in 2013. Prior to 2012, all manufacturing costs were captured in R&D due to U.S. GAAP Accounting Standards that prohibits capitalization of pre-production research and development[156]. As a result, R&D was more than 100% of sales in 2011. In the beginning of 2013, R&D expenses were entirely related to Model S activities and specifically for entering new markets in Europe and Asia. In the first quarter of 2014, R&D expenses increased slightly, reflecting accelerated engineering work on Model X[157].

The nominal value of Selling, General and Administrative expenses nearly doubled from 2012 to 2013 as Tesla continued to increase their presence in all markets[158]. According to Bloomberg, the number of employees grew from ~2,960 to ~5,860 over the same period, which explains much of the increase in SG&A. While Tesla suffers from high administrative expenses, they benefit from minimal marketing and advertising costs, which have accounted for on average 3% of costs for mass-market manufacturers and 8% for premium manufacturers. For premium manufacturers, these high advertising expenses highlight the importance of branding as discussed in the Five Forces analysis.

After the assessment of primary cost drivers, I conclude that increased manufacturing efficiency, volume growth and better management of SG&A expenses explains the majority of the observed increase in profit margin over the period. The development in OPEX indicates that Tesla has a high share of fixed costs and has struggled to control costs during the growth phase. If revenues decline, this may cause profits to decline faster than sales. While this is a characteristic of the industry, Tesla is currently not generating enough profit to cover their high fixed costs. In order to offset costs, Tesla needs to obtain economies of scale. Therefore,

155 Tesla Quarterly Report (Q3 2012), p. 27
156 Tesla Annual Report (2013), p. 65
157 Tesla Quarterly Report (Q1 2014), p. 25
158 Appendix 4.2 – Tesla Motors Analytical Income Statement

the combination of production ramp-up and cost control will be crucial going forward. As the company continue to invest in growth by expanding production capacity for Model S and Model X, invest in stores and charging infrastructure and begin design of the third generation vehicle, I expect and increase in operating expenses.

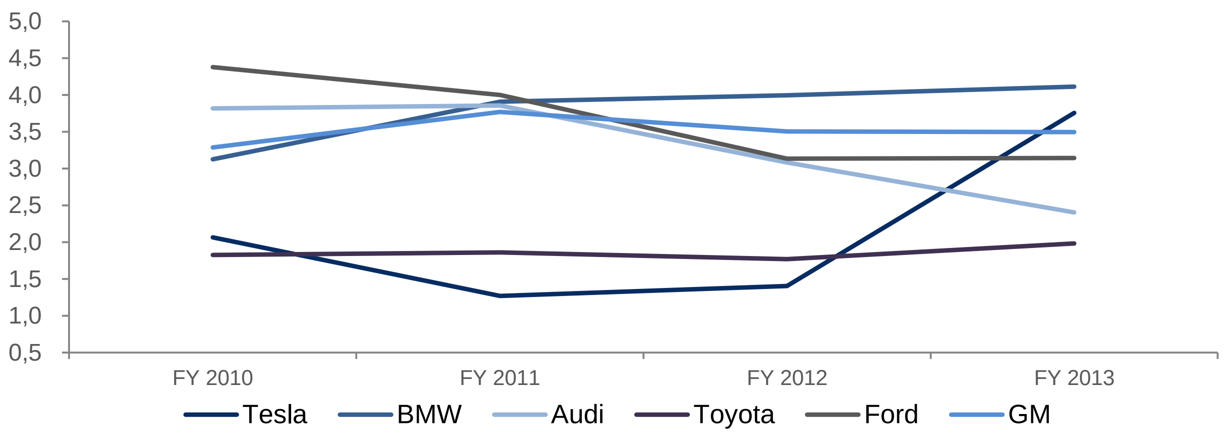
EBITDA-margin

The increase in Tesla's revenues combined with improved management of fixed costs has resulted in a higher EBITDA-margin. Only GM and Toyota experienced a positive growth in profit margin in the last fiscal year. Audi, BMW and Ford all experience negative growth[159]. It is evident from the development in profit margin for peers, that EBITDA has followed the same pattern as ROIC. Therefore, it can be concluded that the profitability of the industry (or lack thereof), has been partially driven by revenues and expenses.

4.2.3 Turnover rate of invested capital

Invested capital turnover is an expression of a company's ability to utilize invested capital, and can also be described as the revenue per dollar invested in operations. The inverse of invested capital turnover illustrates how many invested dollars are needed to generate one dollar in revenue. All else equal, it is attractive for a company to increase turnover.[160]

Figure 4.2: Invested Capital Turnover



Source: Author / Company Reports

The turnover rate for industry peers, improved from 2010 and 2011, but showed a downward trend in the years after. As earlier mentioned, Tesla's revenues increased significantly over the financial year of 2013, which partially explain the positive development in capital turnover. While Tesla has increased their return on invested capital, invested capital turnover fell from 2010 to 2012. In this period, capital turnover was

[159] Appendix 4.3 – Common-Sise Analysis of Income Statatement
[160] Petersen & Plenborg (2012), Financial Statement Analysis, p. 108.

close to or below one, as the company had not yet materialized on their investments. In order to identify the most significant factors behind the improvement in capital turnover, I have performed an indexing and common-size analysis of invested capital. The detailed index analysis of Tesla and peers can be found in appendix 4.3.

Indexing and common-size analysis of invested capital

All companies except for BMW increased invested capital over the analysed period. Audi increased their investments significantly more than other peers, and more than doubled invested capital over the period due to investments in intangible assets and affiliated companies. Besides from Audi, Ford also grew invested capital, as more capital was tied in deferred tax assets and inventory[161]. For both companies, this explains the decrease in invested capital turnover from 2011 to 2013 as seen from figure 4.2. The increase in investments, coupled with a decrease in turnover rate, indicates that assets grew more than revenues. For the remaining companies, invested capital turnover as well as invested capital has remained relatively stable since 2011.

Table 4.3: Days Turnover of Invested Capital	FY 2010	FY 2011	FY 2012	FY 2013
Operational Assets				
Property, plant and equipment	216	369	376	117
Other assets	40	40	20	4
Operating lease vehicles, net	12	18	10	36
Inventory	107	85	141	55
Accounts receivable	16	15	16	7
Prepaid expenses and other current assets	24	18	8	3
Total Operational Assets	**415**	**953**	**2016**	**3829**
Operational Liabilities				
Resale value guarantee				21
Other long-term liabilities	25	24	18	8
Accounts payable	69	76	159	55
Accrued liabilities	55	47	32	13
Deferred development compensation	0			
Customer deposits and reservation payments	89	109	102	27
Total Operational Liabilities	**238**	**257**	**310**	**125**
Invested Capital	**177**	**288**	**259**	**97**

In 2011, one dollar invested by Tesla was on average tied up for 288 days, but in 2013, the company managed to improve efficiency to 97 days. This positive development can especially be traced to improvements in the turnover on property, plant and equipment (PP&E) and inventory. While the nominal value of these assets rose, the increase was far less than the increase in revenues. The high PP&E day's

161 Appendix 4.3 – Indexing of Invested Capital

turnover prior to 2013 reflects the significant constructions that took place in order to prepare the Tesla Factory for manufacturing of Model S[162].

A breakdown of assets included in PP&E, shows that "construction in progress" accounted for ~30% of total assets in 2011, while only ~7% in 2012. Tesla bought the Fremont factory in 2010, and significant investments in building improvements, tooling and machinery were made during 2011 to prepare for the release of Model S[163]. As these assets became ready for use in 2012, investments were recognized as machinery, equipment and tooling. Turnover of operating liabilities also increased over the period, a development that was caused by higher accounts payable and customer deposits related to reservations of Model S. This contributed positively to capital turnover. Lastly, as Tesla began production of Model S in 2012, inventory rose. The drawdown of inventory in 2013 reflects demand for Model S relative to production.

In conclusion, it looks like all the automotive companies have been affected by the cyclicality of the aggregate economy. Tesla's improved turnover rate in the period 2010-2012 can be explained by less capital tied in fixed assets and inventory. The increase in ROIC was a result of an increase in both profit margin and invested capital turnover. Nevertheless, ROIC increased more than capital turnover from 2012 to 2013, as revenue growth exceeded asset growth. From the development of ROIC, it is evident that after a period with high investments in assets and sluggish revenue growth, Tesla may have begun to benefit from these investments.

4.2.4 Return on Equity

The key ratios that have been analysed up until this point have focused solely on operating profitability. Return on equity (ROE) measures profitability, taking into account both operations and financial leverage (FGEAR). As long as ROIC exceeds interest expenses and leverage is positive, ROE will exceed ROIC. If interest expenses are higher than ROIC, leverage will lead to a negative return[164].

Table 4.4	FY 2010	FY 2011	FY 2012	FY 2013	Q1 2014
Leverage	-59 %	-25 %	68 %	35 %	-7 %
Net borrowing cost	-1 %	0 %	0 %	23 %	-21 %
Spread	-259 %	-157 %	-134 %	-35 %	15 %

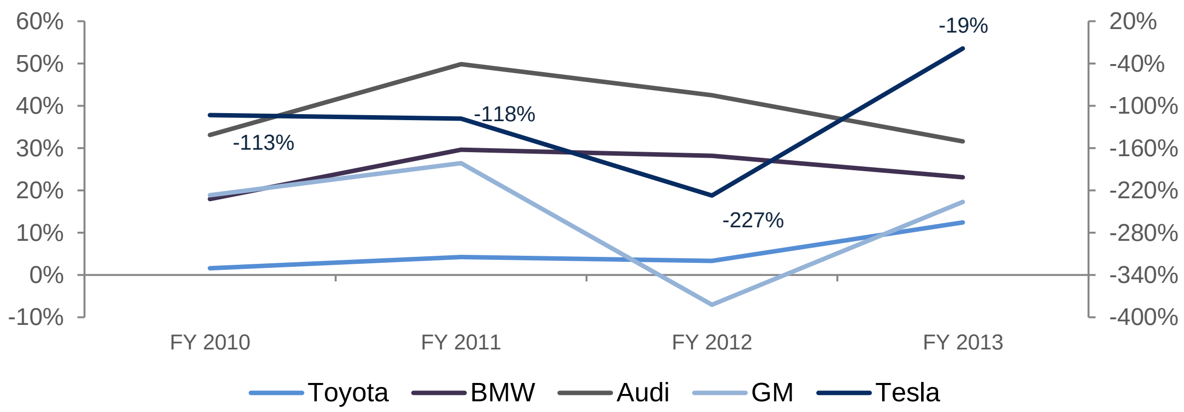
In 2011 and 2012 ~80% of interest bearing debt was a fixed rate loan from The Department of Energy (DOE), which came with an interest rate of only 1.6%[165]. The USD 465 million DOE loan and proceeds

162 Tesla Annual Report (2011), p. 74
163 Tesla Annual Report (2012), p. 116
164 Petersen & Plenborg (2012), Financial Statement Analysis, p. 117
165 Schoenberg, T. (16.01.2013), "Department of Energy Sued for $675 Million Over Clean Energy Loans".

resulted in higher leverage in 2012, which can be seen from table 4.4. In 2013, Tesla issued USD 660 million in convertible bonds to pay of the DOE loan and fund the construction of the Gigafactory[166]. The fact that FGEAR did not increase more in 2013 was due to an increase in equity over the same period, which partially offset the amount of leverage. In the first quarter of 2014, Tesla raised another USD 2 billion in convertible bonds. However, the proceeds from the convertible bond offering are currently sitting as cash on the balance sheet, which is reflected in a negative net interest bearing debt in Q1 2014. The proceeds from the offering are expected to go into CAPEX for the Gigafactory towards the end of 2014 and should therefore bring FGEAR up as the amount of cash is drawn down[167] [168].

Lastly, spread has also been negative over the period, indicating that it has been value destroying for the company to be indebted.

Figure 4.3: ROE, Peers (L) and Tesla (R)



Source: Author / Company Reports

As can be seen from figure 4.3, Tesla increased return on equity from 2012 to 2013, leading to less of a loss for shareholders. The required return on equity, which will be explained in detail in section 7.1, is estimated to be 8.65%. Historically, Tesla has been far from able to deliver on these requirements. Comparing the development in ROE to the share price in figure 1.1, it is evident that the sharp increase in share price has followed the signs of increased profitability of Tesla's activities.

Over the analysed period Tesla improved both profit margin and the turnover rate on invested capital. Toyota and GM created more value for shareholders between 2012 and 2013, while premium manufacturer BMW

[166] Tesla Annual Report (2013), p. 65-66
[167] Tesla Annual Report (Q1 2014), p. 39
[168] Tesla Motors (26.02.2014), "Tesla announces \$1.6 billion convertible notes offering".

and Audi has experienced a downward trend since 2011, partially due to negative economic growth in Europe. Lastly, Ford has been excluded from the analysis of ROE, as the company had negative equity in 2010 and 2011.

4.3 Liquidity risk

Liquidity risk is analysed for the purpose of understanding the company's ability to meet obligations. Failure to do so will significantly limit operating flexibility and eventually lead to bankruptcy. For valuation purposes, this matters because liquidity risk affects Tesla's ability to raise funds. The automotive business is capital intensive, and Tesla's success in the industry depends on the delivery of Model S and Gen 3. If the cost of developing these vehicles exceeds expectations, Tesla will need to raise more capital.

Liquidity risk is measured on a short-term and long-term basis. The short-term analysis determines Tesla's ability to meet current liabilities, while the long-term analysis measures the ability to cover long-term obligations[169].

4.3.1 Short-term liquidity risk

Tesla's ability to meet short-term obligations can be examined with several methods. In addition to assessing the turnover rate of capital, I have considered the current ratio and quick ratio. In the calculation of quick ratio, inventory is excluded. The rationale is that inventory is not liquid enough and excluding it provides a more accurate picture of liquidity[170].

Table 4.5	FY 2010	FY 2011	FY 2012	FY 2013	Q1 2014
Current Ratio	2,4	2,2	1,2	1,5	2,1
Quick Ratio	1,3	1,4	0,7	0,9	1,7
Cash Burn Rate	9	14	7	175	725

Table 4.5 shows that Tesla's short-term liquidity ratios have fallen from the 2011 level, although increasing in Q1 2014. According to Petersen & Plenborg (2012), a liquidity ratio above 1 is generally considered adequate, and a ratio above 2 indicates a low liquidity risk[171].

Short-term liquidity risk is also assessed with use of cash burn rate, which is one of the most conservative measures. The ratio illustrates how long a company can continue to fund operations without raising more funds[172]. This ratio is typically used for companies with significant investments and little earnings, which makes it appropriate for Tesla. Table 4.5 illustrates the cash burn rate in months. From 2010 to 2013, Tesla

[169] Plenborg & Petersen (2012), Financial Statement Analysis, p. 155-156
[170] Plenborg & Petersen (2012), Financial Statement Analysis, p. 155-156
[171] Plenborg & Petersen (2012), Financial Statement Analysis, p. 156
[172] Plenborg & Petersen (2012), Financial Statement Analysis, p. 157

increased the number of months they can continue operations from 9 to more that 700. Based on the three measures of liquidity, I do not believe that Tesla has significant short-term liquidity risk.

4.4.2 Long-term liquidity risk

To assess the long-term liquidity risk, I have used the financial leverage ratio and interest coverage ratio. The leverage ratio compares total liabilities to equity. Petersen & Plenborg (2012) recommends using the market value of equity instead of book value. Interest coverage ratio measures Tesla's ability to cover interest expenses. The long-term liquidity risk is low, if the leverage ratio is low and interest coverage ratio is high[173].

Table 4.6	FY 2010	FY 2011	FY 2012	FY 2013	Q1 2014
Leverage ratio	0,07	0,16	0,25	0,09	0,14
Interest coverage ratio	-200	1186	11597	-1,9	-3,7

Over the analysed period, Tesla has increased their leverage. However, during in the same period the company also issued stocks to raise capital. Loans have been taken to finance growth, as Tesla has not generated sufficient cash from its business to fund major investments. Tesla has a high long-term liquidity risk in terms of non-existing interest rate coverage. In 2011 and 2012, Tesla had net interest income due to the low interest rate paid on the DOE loan. As of today, Tesla is unable to cover interest expenses due to negative operating profits. In contrast, the company's total liabilities are only on average 10% of the market value of equity, which is fairly lower than peers.

Based on the analysis of liquidity risk, I believe Tesla has the ability to meet short-term liabilities, but incurs high long-term risk. While the company has historically relied on equity financing, the recent bond issuances increases the company's financial risk. The combination of higher leverage and the inability to cover interest expenses makes the company vulnerable in the long-term.

4.4 Conclusion of Financial Analysis

From 2010 to 2013, Tesla improved the return on equity with 94 percentage points from -113% to -19%. None of the peers have matched this growth. However, Tesla's ROE is still far below the required return on equity. The profitability of invested capital increased by 250 percentage points over the period, which is the primary factor for the improvement in ROE. This is a result of both components of ROIC. The profit margin has been driven by improvement in nearly all income statement items. This includes higher revenues, reduced production and components costs, and lower expenses related to sales, general and administrative and research and development. The turnover rate on assets have similarly been improved, as Tesla could collect receivables, reduce inventory and improve the turnover rate on fixed assets through sales of the Model S. Tesla has recently increased their leverage by issuing convertible bonds. This enabled them to pay

[173] Leverage ratio = Total liabilities/Market cap. Interest coverage ratio = EBIT/Net interest expenses

off the DOE loan in 2012, and have provided them with funds to finance future growth plans, particularly the construction of the Gigafactory. Lastly, Tesla's short-term and long-term liquidity risk was analysed. Through relatively sufficient current and quick ratios, it was found that the company's primary liquidity risk is long-term. The combination of higher debt levels and a negative coverage ratio means that Tesla may experience difficulties in servicing its debt in the future.

On every measure of profitability, Tesla has delivered negative results. However, based on the same measures, profitability is trending in the right direction. Lastly, it is important to notice that margins have been consistently negative before the introduction of Model S in late-2012. This highlights the fact that future profitability depends on successful execution of upcoming projects. These factors will be reflected in the following valuation.

5.0 SWOT

The Purpose of chapter 3 was to identify Tesla's strategic value drivers. The first part of this analysis focused on the external opportunities and threats that affect growth and profit margin, while the second part addressed Tesla's internal strengths and weaknesses that may secure or harm their competitive position. In chapter 4, I identified financial value drivers. In this chapter, the foregoing analyses are summarized in a SWOT analysis[174]. With this, I intend to create a structured sketch of Tesla's strategic and financial position, which will lay the foundation for future growth and earnings potential.

[174] Strenghts, Weaknesses, Opportunities, and Threats

Strenghts

- Vertically integrated value chain allow for cost and quality control
- The Gigafactory
- Company-owned stores
- Proprietary technology
- Low marketing expenses
- Efficient production
- Lower battery costs
- Good brand perception

Weaknesses

- Already high OPEX is expected to increase
- Poor return on invested capital and equity
- Higher CAPEX requirements over the next years
- High long-term liquidity risk

Opportunities

- Economic growth in key markets and especially in China
- Higher oil prices
- Stricter emission policies
- Currently low interest rates

Threats

- Higher raw material prices
- EV incentives phase out
- Intese competition from manufacturers with more resources
- Lithium supply constraint
- Lower oil prices short term

6.0 Forecasting

The challenge of valuing a young company such as Tesla is evident from the financial analysis, which showed that the company has historically experienced negative cash flows. This means that the value of the company comes from future growth, with historical profitability being less predictive of future value creation. The forecasts in this chapter are based on my belief that Tesla's operating profitability will converge towards a target level.

6.1 Budget period

In order to estimate future cash flows, it is necessary to determine an appropriate time frame for the budget period. A continuing-value approach assumes a steady-state performance, and the explicit forecast must therefore be long enough for the company to reach a steady state[175]. To ensure this, I have considered Tesla's strategic plans and chosen a period that reflects future products and the construction of the Gigafactory. The period must also be long enough for the growth rates to be less than or similar to the growth of the economy and for demand and supply to balance. The company will experience a high growth until they are able to

[175] Koller, T. Goedhart, M. And Wessels, D. (2010), Valuation, p. 186

service existing demand. Based on findings in the strategic and financial analysis, I believe that a supply/demand balance will be achieved some time after 2020, driven by cheaper models and sufficient supply of battery cells as the full capacity of the Gigafactory is utilized. In the years following 2020, I believe growth will be higher than the aggregate economy but decreasing. However, due to the uncertainty of forecasting each line item beyond 2020, I have chosen a two-stage forecast model where the high growth phase from 2014 to 2020 is based on explicit budgeting and a medium growth stage from 2020 to 2023 where the growth rate will fade towards the growth of the economy.

6.2 Terminal growth

In the strategic analysis, I found that the global vehicle market have grown at a CAGR of 4% since 2000. As the industry is highly sensitive to economic cyclicality, I believe that this historical growth rate captures volatility over the long-term. I also depicted that there is a high correlation between vehicle sales and GDP. This is further highlighted by the fact that the global economy is expected to grow ~3.9%-4.0% annually over the period. This means that the industry has matured up to a point where the long-term growth rate mirrors the growth of the economy. As I believe Tesla will reach a steady state in 2024, I base my estimate on the prospects of the global economy, and expect long-term growth of 4%, in line with IMF (2014) projections and the historical growth rate of the industry. The terminal growth will be further discussed in the sensitivity analysis in chapter 9.

6.3 Explicit forecast – pro forma income statement

The explicit forecast from 2014 to 2020 will be based on findings from the strategic and financial analysis of the company. As can be seen from table 4.1, revenues from development services have been highly volatile and decreasing. Furthermore, revenues from sale of emission credits are expected to cease as customers of these credits i.e. automakers, conform to the emission standards and increase their portfolio of EVs. I do not see these sources of revenue as sustainable in the future, and deems them as only having a miniscule impact on operating profits. My forecast will therefore be based exclusively on my expectations for vehicle sales.

6.3.1 Development of automobile sales

Revenue growth and margins express my expectations of future volumes, product mix and OPEX development. The key constraint for revenue growth is the production limitations of the Tesla Factory and long production lead-time. It is therefore highly unlikely that there will be an oversupply of Model S, Model X and Gen 3 over the period. In this regard, revenue is forecasted based on my expectations for production rates.

6.3.1.1 Price

Tesla's pricing strategy is based on transparency and equal pricing across markets[176]. This means that the differences in prices are due to country-specific taxes, EV incentives and transportation costs. As mentioned

[176] Tesla Annual Report (2013), p. 66

in the company introduction, both Model S and Model X is and will be offered with three different battery options at prices from USD 69,000 to USD 93,400 for the performance version, excluding the USD 7,500 tax credit. However, this also excludes battery options and other features, which led to an average sales price of USD ~91,500 in Q1 2014. In 2014, I have forecasted with this price level. In subsequent years, I believe that increased competition from incumbent manufacturers will drive prices downwards. Lastly, Tesla has guided a price point below USD 40,000 for Gen 3, excluding battery options. Based on the premium paid for Model S above the guided price, I estimate a starting price of USD 45,000 for Gen 3.

6.3.1.2 Production volume

In order to assess future production in volumes, I have taken a bottom-up approach based on management's targets and my own expectations of capacity ramp-up at the Fremont plant. Estimated volumes, combined with estimated product mix and average sales prices, will be used to determine the revenue from automotive sales. Finally, I will determine Tesla's potential market share based on the estimated sales numbers and my expectations of the global industry and premium segment. A bottom-up approach supplemented with a top-down market sizing as a sanity check, will contribute to a reliable forecast of sales.

In 2012, Tesla produced on average ~50 units Model S per week. Since then, the company has consistently increased production rate to 600 vehicles per week by the end of 2013, and delivered a total of 22,477 vehicles globally[177]. Management has guided a production rate of 1,000 per week (~50,000 annually) during 2014 and expect to deliver 35,000 vehicles in total this year. This implies a growth in vehicle sales of 64% from 2013. The Fremont facility has an estimated capacity of 500,000 vehicles per year and management is targeting this run rate by 2020. The high production growth will be catalysed by the construction of the Gigafactory, which is expected to supply lithium-ion batteries to serve 500,000 vehicles (ref. section 3.3.1.1). The factory will be fully operational by 2017 and is projected to contribute to economies of scale and lower battery costs. Besides from the new battery factory, Tesla is focusing on increasing vehicle production through manufacturing improvements[178].

As mentioned in the strategic analysis, Tesla has historically proven their ability to execute on their projects. This will also be necessary in order to accomplish future production targets. The guidance of 500,000 vehicles in 2020 would mean a production CAGR of ~49% from the 31,000 in 2013. While this seems ambitious, the company have a history of exceeding their own guidance. In order to forecast production for 2014, I have based my estimate of the current production rate and the units produced in the first quarter. In Q1 2014, Tesla produced 7,535 vehicles. If this rate remains flat throughout the year, Tesla would reach ~30,000 units. However, given the focus on expanding factory capacity and the manufacturing efficiency

[177] Appendix 6.1 – Forecast fo sales
[178] Tesla Annual Report (2013), p. 66

identified in the strategic analysis, I forecast production of 50,000 vehicles in 2014 and deliveries of 35,000, in line with management's guidance. From 2014, I forecast a ~47% CAGR in production and an output of 500,000 vehicles in 2020.

6.3.1.3 Sales growth

As I believe production expansion will be the key driver of sales growth between 2014 and 2020, I forecast the quantity of vehicles sold within the limits of production. With the introduction of new vehicle platforms over the next years, revenue growth will be step-wise. Therefore, I have applied an expected year-over-year growth rate instead of a continuous rate to reflect the step-changes of new vehicle platforms. For all segments, I forecast a high growth in the first two years of introduction, followed by a more modest growth rate and a flat or falling growth in subsequent years.

For Model S, I expect unit sales to be driven by demand in North America and Europe though 2017, and growth to decline with the introduction of Gen 3. Tesla is targeting a production rate of 20,000 Model X vehicles annually. Deliveries are expected to start in mid-2015. I therefore believe that a total of 10,000 units of the Model X will be delivered in 2015. With the launch of the Model X at the same price and with equal battery size as Model S, the growth rate for Model S should decrease from 2015 an onwards as Model X will cannibalize part of the market for Model S. This is reflected in my model, where Model S deliveries stabilize between 2015 and 2016, as most sales growth will come from Model X.

Gen 3 will begin deliveries in 2017, and will make Tesla able to tap into the mid-price premium segment, which I expect is a fairly larger market. This is reflected in a longer high-growth period and a significantly larger volume than the previous models. While Gen 3 will attract a different customer segment, the depletion of EV incentives and a lower number of early adopters among customers should drive customers towards the cheaper Gen 3, at the expense of Model S and Model X. With this expected development, I am conservative in the forecast of Model S from 2017-2020 and expect only a small increase in year-on-year sales. In 2020, I believe that Gen 3 will account for ~75% of total units delivered.

Table 6.1: Sales	F 2013	E 2014	E 2015	E 2016	E 2017	E 2018	E 2019	E 2020
Production	**31 000**	**50 000**	**73 390**	**107 722**	**158 114**	**232 079**	**340 646**	**500 000**
Deliveries								
Model S, Units	22 477	35 000	50 000	55 000	58 300	57 134	55 420	53 757
Growth		*55,7 %*	*43 %*	*10 %*	*6 %*	*-2 %*	*-3 %*	*-3 %*
Model X, Units			10 000	30 000	39 000	42 900	45 045	47 297
Growth				*200 %*	*30 %*	*10 %*	*5 %*	*5 %*
Gen 3, Units					50 000	100 000	180 000	297 000
Growth						*100 %*	*80 %*	*65 %*
Total Deliveries	**22 477**	**35 000**	**60 000**	**85 000**	**147 300**	**200 034**	**280 465**	**398 055**
Avg. price /unit (t)								
Model S	78	92	90	88	86	84	83	81
Model X			92	90	88	86	84	83
Gen 3					45	44	43	42
Revenue (bn)								
Model S		3 203	4 484	4 834	5 022	4 823	4 585	4 358
Model X			915	2 691	3 428	3 695	3 802	3 913
Gen 3					2 250	4 410	7 779	12 579
Total Revenue	**1 758**	**3 203**	**5 399**	**7 525**	**10 699**	**12 927**	**16 166**	**20 849**

6.3.1.4 Implied market share

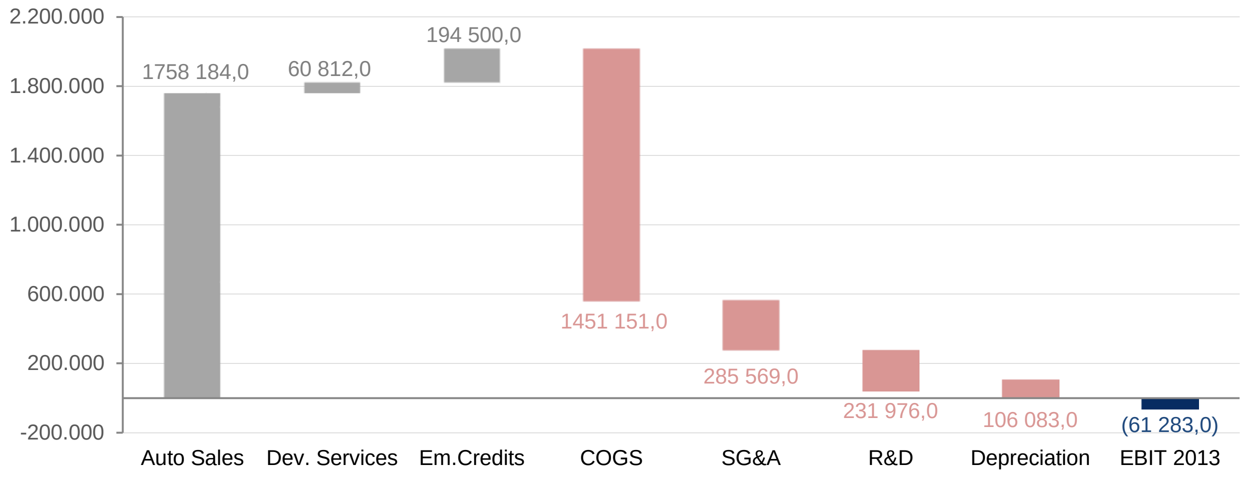
Tesla's revenue expansion has been greater than the average seen for the peer group during the past three years. This implies that Tesla is gaining market share[179]. Apart from the acquisition of the Tesla Factory in 2010, growth has been organically. As mentioned earlier, the global vehicle market has been growing at a CAGR of ~4% since 2000. Given that the global economy is expected to grow between 3.9% and 4.0% from 2015-2019, I forecast global vehicle sales to reach ~100 million in 2020[180]. Furthermore, if the total premium segment grows to 10.7% of total sales in 2020, Tesla would achieve a market share of 3.7% in 2020[181]. Even with the expected sales of ~400,000 vehicles in 2020, Tesla will remain a small player in the premium segment.

6.3.2 Profit Margin

To project Tesla's future profit margin, I will include my expectations for each sub-component of operating expenses as illustrated in figure 6.1: Cost of goods sold[182], sales, general and administrative expenses[183], and research and development[184]. Lastly, a budgeting of depreciation and taxes will lay the foundation for the forecast of the total operating profit margin. Expectations of the development of profit margin in the explicit budgeting period are based on conclusions from PEST, Porters five forces, the value chain analysis, and the financial analysis. The target long-term profit margin is also based on the margins earned by peers.

[179] See financial statement analysis
[180] See PEST-analysis
[181] Appendix 6.2 – Implied Market Share
[182] Commodities and raw-materials, manufacturing labor and other costs.
[183] Expenses related to distribution and sales labor, freight, advertising and marketing and salaries and other expenses related to administration.
[184] Research and development of new models, battery and powertrain and other.

Figure 6.1: Tesla EBIT Walk FY 2013



6.3.2.1 Profit margin, 2020 →

As noted in the financial analysis, Tesla is currently operating with a negative margin. The EBITDA-margin calculated for peers is 7-9% for mass-market manufacturers and 15-16% for premium manufacturers[185]. By 2020, I believe Tesla will obtain a profit margin that captures the previously estimated mix of Model S/X and Gen 3. This will position Tesla in both the premium market and the mid-price premium/high-end mass-market (definitions vary in different geographical areas). In the long run, company-owned distribution is a competitive advantage, which will make Tesla able to capture dealership margins[186]. Tesla should also benefit from relatively low advertising costs once distribution related expenses stabilize. In my model, I target a long-term EBITDA-margin of 15%, in line with peers in the premium segment.

6.3.2.2 Profit margin forecast, 2014-2020

Table 6.2: Profit margin drivers

Positives	**Negatives**
Decreasing battery costs	Rising raw-material prices
Premium segment	Increasing intensity of rivalry
Efficient manufacturing	High SG&A
Company-owned stores	High R&D expenses
Low advertising expenses	

In the financial analysis, I discussed how revenue growth and expansion in vehicle gross margin is the primary driver of profit margin. Going forward, this will partially be offset by lower emission credit sales (100% profit margin), which was an important factor for achieving positive EBITDA in 2013 (see figure 6.1). Additionally, margins will continue to be limited by high SG&A and R&D expenses. On the positive side, I see falling battery costs as a key driver of profit margin. The positive and negative drivers of profit margin are summarized in table 6.2.

Cost of revenues (COGS)

In the financial analysis, it was found that typical industry costs of vehicle sales include commodities and materials, warranties, pension costs and other manufacturing costs. COGS are on average ~80%-90% of

[185] Appendix 4.3 - Common-size analysis of Income Statement
[186] According to Autonews (2014), the average pre-tax profit margin for U.S. dealerships was 2,2% in 2013

revenues for mass-market manufacturers and ~70% for premium manufacturers. Since 2012, Tesla has expanded gross margin from 14% to 28%[187]. Management has guided a gross margin (including D&A and excluding emission credits) of 28% in 2014. This is well in line with premium manufacturers.

Materials and commodities are the largest cost factor and account for on average ~60% of revenues. For peers, material costs have increased slightly over the years, which can be explained by the inflation in raw material costs covered in the strategic analysis. Tesla's COGS structure differs from traditional OEMs, as the largest component of material cost is the battery pack. In order to reflect the effect of changes in the underlying cost components in my model, I have broken down COGS to determine gross profit. The complete forecast of critical variable cost components can be found in appendix 6.3.

As was found in the strategic analysis, Tesla has a temporary competitive advantage due to lower battery cell costs. Additionally, battery costs are expected to decrease by 30% in 2020 with the construction of the Gigafactory and with industry wide innovation[188]. As mentioned in the external analysis, battery costs are not publicly listed and estimates are therefore highly uncertain. The media and most industry analysts believe that the current price of Tesla's battery pack is USD 400 per kWh, based on the assumption that the price difference of USD 10,000 between a 60kWh and a 85kWh version of Model S comes from the added costs of the battery pack. However, as can be seen from table 2.1, this price difference includes a "Supercharging" premium of USD 2,000, which is included in the 85kWh model. Adjusting for this, I estimate a current cost of USD 320[189]. This is significantly cheaper than the industry level (USD 400-750) and gives Tesla a competitive advantage over other EV manufacturers as depicted in the value chain analysis.

With a cost reduction of 30% from the current level, battery costs should fall at a compounded annual rate of ~5% to USD 224 per kWh in 2020. Table 6.2 shows my expectations of future battery costs per kWh and per vehicle, based on an equal weighting between sales of the 60 kWh, 85 kWh and Performance 85 kWh Model S/X. For Gen 3, Tesla has guided a battery size reduction of 30%, in which I estimate an equal weighting between a 65 kWh and 48 kWh versions.

[187] Table 4.2
[188] Tesla Annual Report (2013), p. 69
[189] ($10,000 - $8,000) / 25kWh = $320

Table: 6.2

Battery Cost Forecast	F 2013	E 2014	E 2015	E 2016	E 2017	E 2018	E 2019	E 2020
Battery Pack (bn)	(551)	(816)	(1 329)	(1 790)	(2 652)	(3 242	(4 107)	(5 328)
Per vehicle (t)								
Model S	(25)	(23)	(22)	(21)	(20)	(19)	(18)	(17)
Model X			(22)	(21)	(20)	(19)	(18)	(17)
Gen 3					(14)	(13)	(13)	(12)
Per kWh	320	304	289	275	261	248	236	224

The remaining amount of material costs is the raw materials mentioned in the external analysis. According to the World Bank (2014), the prices of nickel, copper and aluminium is expected to increase with a CAGR of ~1% over the next years[190]. This will have a negative impact on gross margins and is reflected in the model where material costs (ex. battery pack) increases annually at this rate. In the industry analysis, I concluded that typical OEM suppliers have moderate bargaining power. Tesla is still in a growth phase where financial and operational risk may limit their bargaining power over suppliers. As the company grows, they should be able to exert more power over suppliers and limit potential price increases.

Driven by a slight increase in material costs (ex. battery pack) and a reduction in battery cell costs, I forecast gross margin for automotive sales to 30% over the next three years. With the launch of Gen 3 in 2017, gross margin decreases towards 25% in 2020, as margins of this vehicle will be lower.

Fixed costs

Tesla's negative result has primarily been due to high SG&A and R&D expenses, which can be explained by the growth rate and stage in the company's lifecycle. The explicit forecast of these expenses is based on the company's future growth prospects as described in the internal analysis, and the financial value drivers identified in the financial analysis.

Sales, general and administrative expenses has historically accounted for ~42% of revenue, with only 1-2% attributed to advertising. As mentioned in the financial analysis, the level was significantly reduced to ~14% in 2013 as a result of the growth in revenues. In 2014, the expansion of stores and services centres should result in higher SG&A expenses. However, the forecasted increase in revenue will offset part of this increase. I therefore forecast SG&A to 15% of revenues in 2014 (unlike 14% in 2013) . As mentioned in the financial analysis, the average SG&A spending for peers is 8%. From 2015 and onwards, I see SG&A expenses decreasing at an increasing rate. I have forecasted 6% in SG&A in 2020, as Tesla should benefit from the low marketing expenses relative to peers in the premium segment.

[190] World Bank (2014) - Nickel prices remain stable, copper to deacrease at CAGR ~1%, aluminium to increase at CAGR ~2%.

The ramp-up of production of Model S and Model X and the development of Gen 3 will require significantly more R&D spending in a shorter term. In 2014, Tesla has guided an increase in R&D expenses, but rates are expected to decrease and approach the industry level over time, due to Tesla's relatively narrow product portfolio and future scale economies.

Other income statement items

- Depreciation: With the forthcoming of two new vehicle platforms and the construction of the Gigafactory, the relationship between capital expenditures and revenue will be nonlinear. In this case, McKinsey (2010) recommend forecasting depreciation as a percentage of PP&E[191]. From 2010-2013, depreciation was on average 8.6% of property, plant and equipment, which equals a linear depreciation of ~12 years. Computer equipment has a useful life of 3 year, machinery and equipment 3 to 12 years, while buildings are depreciated over 30 years[192]. Machinery and equipment will account for a significant amount of total PP&E as Tesla expands its network of stores and superchargers and invest in tooling for Model X and Gen 3. I therefore believe depreciation over 12 years i.e. 8.6% annually is the best estimate going forward.
- Effective tax rate: I have applied an effective tax rate of 25%. This is the global average as will be described in the calculation of WACC.
- Net borrowing rate (NBC) has historically been 0.2% of revenues, with exception of 2013 as mentioned in section 4.1.1. Historically, interest expenses were related to the DOE loan. With the issuance of convertible bonds, historical NBC is a bad proxy for the future. As will be described in detail in relation to WACC in chapter 7, Tesla's credit rating implies a credit spread of 7.25% above the risk free rate. I have therefore estimated the costs debt to 10.06%.

Forecast of the pro forma income statement is presented in table 6.3. Note that numbers are rounded off.

[191] Koller, T. Goedhart, M. And Wessels, D. (2010), Valuation, p. 194
[192] Tesla Annual Report (2013), p. 101

Table 6.3.

Pro forma Income Statement	Hist.	E 14	E 15	E 16	E 17	E 18	E 19	E 20	E 21	E 22	E 23	E 24
Revenue Growth	142%	59%	69%	39%	42%	21%	25%	29%	15%	10%	5%	4%
Gross-margin	26%	30%	30%	30%	28%	27%	26%	25%	25%	25%	25%	25%
SG&A, % of revenue	42%	15%	13%	12%	10%	9%	7%	6%	6%	6%	6%	6%
R&D, % of revenue	55%	13%	11%	9%	8%	7%	5%	4%	4%	4%	4%	4%
Net borrowing rate	0%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%
Effective tax rate	-1%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%
Depreciation, % of PP&E	9%	9%	9%	9%	9%	9%	9%	9%	9%	9%	9%	9%

6.4 Explicit forecast – pro forma balance sheet

The relationship between balance sheet items and revenues are more stable than the relationship between changes in the balance sheet and changes in revenues[193]. I have therefore chosen to link balance sheet items to revenue. In light of the financial analysis, I project the key components of capital turnover separately.

6.4.1 Fixed tangible assets (CAPEX)

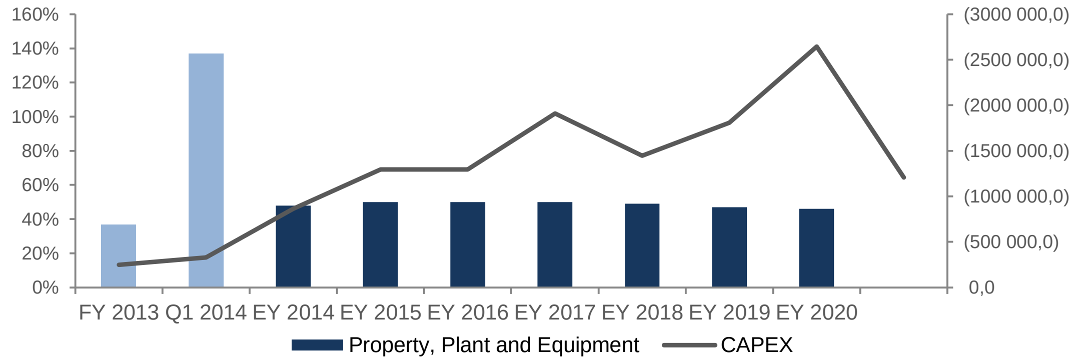
Investments in fixed assets are a function of capital expenditures (CAPEX) and depend on the capital intensity of the industry and company-specific strategies[194]. As analysed in Porters Five Forces, the automotive industry is highly capital intensive, and Tesla's aggressive growth strategy will require significant investments above the industry normal. Investments in property, plant and equipment (PP&E) has on average accounted for ~60% of total operating assets, and is the main driver of asset growth. In 2013, machinery, equipment and tooling contributed to the majority of investment in PP&E. I expect investment in fixed assets to steadily increase concurrently with expansion of production capacity, infrastructure and the Gigafactory. From 2014 to 2020, I project investments in tangible assets to include the following:

- Expansion of production capacity at the Fremont factory for Model S and Model X from 31,000 vehicles in 2013 to the expected 107,722 vehicles in 2016[195]. For Model X, this will require additional tooling and equipment. However, as Model X is a crossover from Model S i.e. built on the same platform, I believe the investment need is lower than for the launch of Model S.
- Over the course of 2014-2015, Tesla will expand the stores and service infrastructure from the current 110 locations by 75% and install 200 Supercharges in North America, Europe and China in 2014[196].
- Between 2014 and 2015 construction of the Gigafactory will begin. Tesla expects production of battery cells to begin in 2017, and capacity to be fully utilized in 2020. Through 2020, ~USD 4-5 billion will be invested in the factory, of which 2 billion will be invested by Tesla[197].
- The launch of Gen 3 in 2017 will require significant investments in tooling.

[193] Koller, T. Goedhart, M. & Wessels, D. (2010), Valuation, p. 199
[194] Koller, T. Goedhart, M. & Wessels, D. (2010), Valuation, p. 201
[195] Appendix 6.1 – Forecast of Sales
[196] Tesla Quarterly Report (Q1 2014), p. 29
[197] Appendix 3.3 - Gigafactory Projected Timeline

Tesla has guided capital expenditures of USD 650-850 million in 2014[198]. Given the significant investments above, I believe USD 850 million is appropriate[199]. CAPEX should be higher from 2014-2017. After the launch of Gen 3 in 2017, investment needs will slowly decrease as a percentage of revenue. Tesla has not guided any investments beyond this point. My expectation is that from 2020 and onwards Tesla will need to invest in a second manufacturing plant and battery cell facility, if they are to increase production beyond the 500,000 vehicles anticipated in 2020. However, by this time the company should be able to utilize retained earnings and be in less need of external funding. In 2024, I expect CAPEX to stabilize at 6% of revenues. My expectations for PP&E and CAPEX from 2014-2020 is illustrated in figure 6.2. The pike in 2017 is a reflection of the revenue growth from Gen 3.

Figure 6.2: Investment in PP&E and CAPEX 2013 - 2020



Other balance sheet items

All other balance sheet items are estimated as a percentage of revenue except for net interest bearing debt, and based on historical values and my expectations for future development. Forecasts are shown in table 6.4.

- Net interest bearing debt (NIBD): To bring net interest bearing debt on the balance sheet in line with the capital structure implied in WACC, I have used the expected long-term debt-ratio calculated in chapter 7, of 48.4%. As will be described in more detail in the calculation of WACC, I expect NIBD to increase gradually up to the target debt level due to the investments in PP&E.
- Accounts receivable have on historically been 4.8% of revenues and include sales of powertrain systems and emission credits[200]. As mentioned, credit sales and powertrain serviced and development is expected to decline in the future and I therefore expect changes in sales contracts. However, with the business expanding in other areas, receivable is likely to come from other sources. I forecasted accounts receivable to stay at the same rate.

[198] Tesla Quarterly Report (Q1 2014), p. 29
[199] Tesla will go from a production rate of 31,000 vehicles in 2013 to 50,000 vehicles in 2014 = 61% increase
[200] Tesla Annual Report (2014), p. 100

- The analysis of invested capital, showed that inventory as a percentage of revenue was at its highest in 2012, when Tesla increased inventory to meet production requirements for Model S[201]. In 2013, inventory dropped to ~17%. With better inventory management, I believe that the ~17% in 2013, is the best estimation for future levels.
- Operating liabilities have historically been high but significantly decreased from about 120% in 2012 to 40% in 2013. I expect that operating liabilities, as a percentage of revenue will stabilize around 40%, but decrease slightly over the years.

Table 6.4

Pro forma Balance Sheet	Hist.	E 14	E 15	E 16	E 17	E 18	E 19	E 20	E 21	E 22	E 23	E 24
PP&E, % of Revenue	104%	48%	50%	50%	50%	49%	47%	46%	46%	46%	46%	46%
Inventories, % of Revenue	36%	17%	17%	17%	17%	17%	17%	17%	17%	17%	17%	17%
Notes and accounts, % of Revenue	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Operational liabilities, % of Revenue	85%	42%	40%	40%	38%	38%	36%	36%	36%	36%	36%	36%
NIBD, % of Invested Capital	-4%	4%	20%	30%	40%	45%	48%	48%	48%	48%	48%	48%
CAPEX, % of Revenue	-74%	-27%	-24%	-17%	-18%	-11%	-11%	-13%	-9%	-8%	-6%	-6%

6.5 Development of profitability (ROIC)

Based on the assumptions presented in this chapter, I have forecasted the financial statements. The development of ROIC and profit margin, is illustrated in figure 6.3. ROIC and profit margin is measured after tax, to reflect the forecasted tax rate.

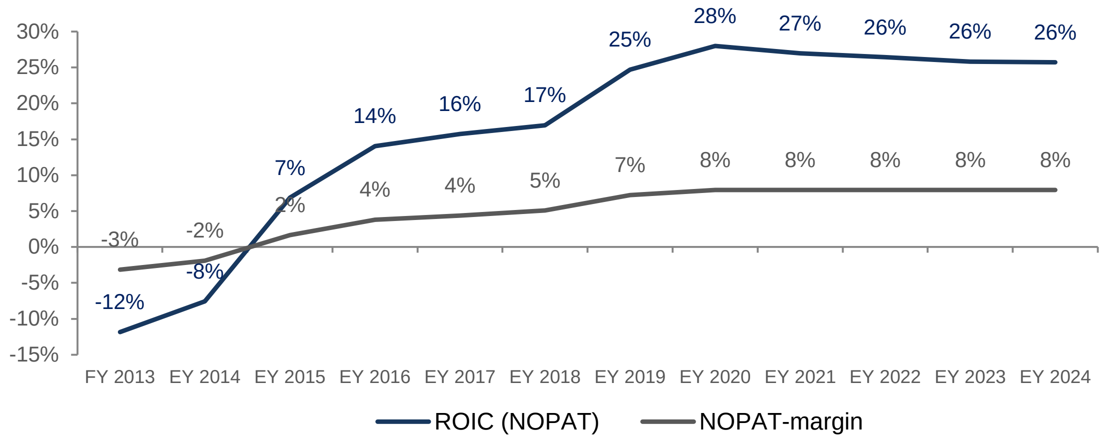
Tesla has grown immensely since the initial public offering in 2010. However, capital investments, high fixed costs and limited sales have resulted in a negative NOPAT-margin. I believe the revenue growth observed with the launch of Model S support a positive development that will be reinforced with the launch of Model X and Gen 3. Over the period, profit margin will increase and stabilize at 10-11% in 2020, a margin seen for comparable premium manufacturers.

Tesla's growth will come in two increments, one for Model X from 2015 to 2017 and one for Gen 3 in 2017. The transition from one growth phase to another is reflected in the small kink in ROIC 2018.

ROIC will continue to grow until Tesla reaches the production target of 500,000 vehicles in 2020. Beyond this point, ROIC should gradually decline toward a steady state, but still be in line with the profitability of Audi and BMW. Based on these assumptions, I see validity in my forecast.

201 Tesla Annual Report (2013), p. 85

Figure 6.3: Development of ROIC and NOPAT



7.0 Weighted Average Cost of Capital (WACC)

The weighted average cost of capital is used for discounting the excess return (EVA) and free cash flow (DCF) to time 0. WACC reflects equity and debt investors' expected compensation for the time value of money and the risk related to the particular asset[202]. In case of default, debt holders have the priority. The required return must therefore be calculated separately for the two types of investors. As of today, Tesla has no subsidiaries and therefore only access to external financing in terms of equity and debt. WACC can be expressed with the following formula[203]:

$$WACC = \frac{NIBD}{(NIBD + E)} \times r_d \times (1 - t) + \frac{E}{(NIBD + E)} \times r_e$$

In the next sections, each component of WACC will be estimated following these steps:

1. Expected return on equity
   - The risk-free rate
   - Beta
   - Marked risk premium
   - Liquidity premium
2. Cost of debt
3. Long-term capital structure

[202] Petersen & Plenborg (2012), Financial Statement Analysis, p. 245
[203] Petersen & Plenborg (2012), Financial Statement Analysis, p. 246

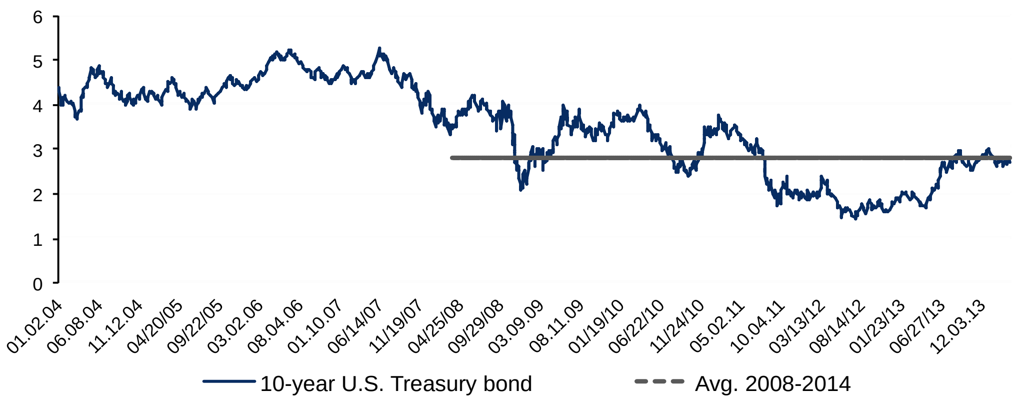
7.1 Expected return on equity, r_e

The cost of equity is a measure of investors' required return on a security, equal to the opportunity cost of investing in an alternative portfolio. The majority of the literature recommends using the CAPM-model for this purpose, which relies upon a number of assumptions and illustrates the relationship between the return on equity and the risk associated with the market portfolio[204] [205]. I have chosen this model to estimate the return to Tesla's shareholders. Since the company only have common shares outstanding, I will only estimate a single return on equity.

7.1.1 The risk free rate, r_f

The risk free rate is the return on a security that investors can expect with certainly, i.e. no risk. In most developed countries, where the government is viewed as default free, the long-term government bond rate can be used as a proxy for the risk free rate. Damodaran (2009) highlights the importance of consistency between cash flows and the risk free rates, in order to deal with currency and inflation. When cash flows are estimated in nominal terms, the U.S. Treasury bond rate is appropriate. U.S. Treasury bonds are measured in nominal values, since the U.S. have relatively stable and low inflations[206]. Tesla's cash flows are also nominal and reported and forecasted in USD. Using U.S. bonds therefore provides sufficient consistency.

Figure 7.1: U.S. Treasury Bond Rate, %



Source: Compiled by author / U.S. Department of Treasury

In theory, the long-term government bond can only be used as a proxy for the risk free rate, if it is default free and thus have no default premium. Since the valuation assumes infinite cash flows, a 30-year zero-coupon bond would match the cash flows better than a 10-year government bond. However, there are some risk of deflation and illiquidity over the long run, which is reflected in a risk premium on 30-year zero-coupon bonds[207]. Based on the 10-year bond per 31.03.2014, I estimate the risk free rate to be 2.73%[208]. As

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[204] Petersen & Plenborg (2012), Financial Statement Analysis, p. 245,

[205] $r_e = r_f + \beta \times (r_m - r_f)$

206 Damodaran, A. (2008), "What is the risk free rate? A search for the basic building block".

[207] Petersen & Plenborg (2012), Financial Statement Analysis, p. 251

can be seen from figure 7.1, this is lower than the 6-year average of 2.81%. Since WACC is assumed to be constant in the future, I have chosen the average rate from 2008 to 2014 to reflect the long-term risk free rate. This reduces the risk of using a too low rate, which will overestimate the value of the company.

7.1.2 Systematic risk, β

Beta is a measure of systematic risk and is derived as a function of the relationship between the actual return on the respective stock and the return on the market portfolio. Beta captures the risk added by a single security to a broad and diversified portfolio[209]. Beta can be determined in multiple ways, and the implications vary across the different methods. In order to estimate the most valid beta value, I have explored the most common methods and arrived at a conclusion based on the average of these estimates.

Regression beta

Beta can be estimated by regressing the historically observed returns against the market portfolio. According to Damodaran (2009), there are a number of factors to consider that have implications for the estimate[210].

1. The choice of Market index
2. The choice of time period
3. The choice of return interval
4. Post-regression beta adjustments

As mentioned in the introduction, American investors hold the majority of Tesla's shares. The remaining amount is spread across different countries. In such, I have chosen the S&P 500 index and MSCI North-America index to represent the majority of investors. The MSCI World index is also chosen to represent foreign investors, and to include an index with more securities. According to Damodaran (2012), indices that include more securities and are market-weighted, yields better estimates. All of the above indexes are market-weighted. The validity of the covariance estimates increases with the frequency of data, suggesting the use of daily observations[211]. Given Tesla's short history as a public company and the high liquidity of the security, I have chosen to regress beta based on daily observations from 2012-2014.

Table 7.1: Regression Beta

Raw beta 2012-2014	**Levered**	**Unlevered**
Beta MSCI World	1,260	1,166
Beta MSCI North America	1,513	1,401
Beta S&P	1,469	1,360
Average	**1,414**	**1,309**

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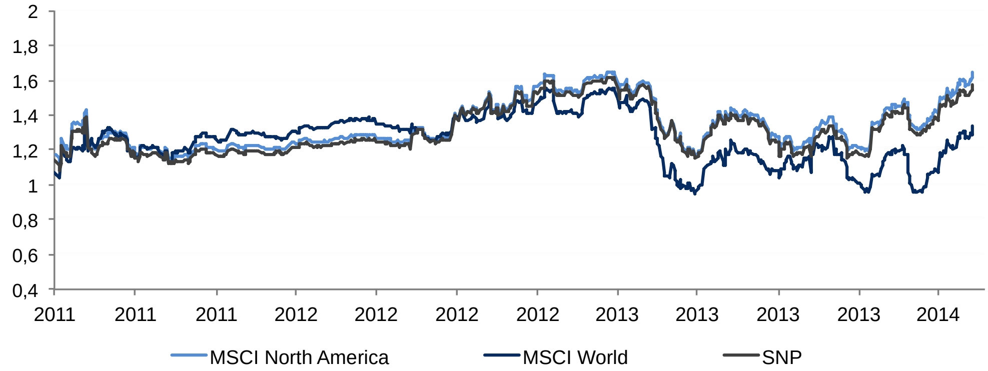
[208] U.S. Department of Treasury – Interest Rate Statistics
[209] Petersen & Plenborg (2012), Financial Statement Analysis, p. 249
[210] Damodaran, A. (2009), "Estimating Risk Parameters". pg. 6
[211] R. Merton (1980), "On Estimating the Expected Return on the Market".

The levered regression beta is affected by the company's capital structure. For the purpose of deriving WACC, I will use the expected future capital structure. Thus, beta has been unlevered by adjusting for the average debt/equity ratio and effective tax rate over the period of the regression. This gives an unlevered beta of 1.31.

For valuation purposes, company beta should be relatively stable over the historical period. The one-year moving average of beta in figure 7.2 highlights the volatility across the three indices. This increases the need for comparing different methods to reduce potential sourcing errors.

Figure 7.2: 1-Year Moving Average Beta



Source: Compiled by author / Nasdaq / MSCI

Fundamental beta

A second way to estimate beta is to analyse the fundamentals of the business. Beta is determined from three variables: the business the firm operates in, the degree of operating leverage and the financial leverage[212]. As discussed in the strategic analysis, the automobile business is highly cyclical and sensitive to economic conditions. Damodaran (2012) also extends this view to a firm's products, arguing that firms whose products are more discretionary (customers can defer from buying them) should have higher betas[213]. This should place Tesla in the high end of the scale. From the strategic and financial analysis, I have gained insights that can be used to assess the operating and financial risk of the firm. The analysis can be found in appendix 7.1. Based on the analysis, I classify Tesla's operating risk as high and the financial risk as neutral, leading to an overall high level. According to Petersen & Plenborg (2012), this translates into an unlevered beta of 1.15-1.40[214]. Taking the average, I estimate a beta of 1.28.

[212] Damodaran, A. (2012), Investment Valuation, p. 183
[213] Damodaran, A. (2012), Investment Valuation p. 184
[214] Petersen & Plenborg (2012), Financial Statement Analysis, p. 262

Industry beta

An alternative way to estimate beta without the disadvantages arising from using beta from regression and comparable firms, is the industry beta. Over time, Tesla's beta should approach the one observed for industry. Damodaran (2014) use estimates of beta based on the average beta across the entire industry. In a dataset from 2014, he estimates the auto industry beta based on 26 global companies. The result is an unlevered beta of 0.72[215].

Unlevered beta

As the last step, I have re-levered the average beta by adjusting for the expected capital structure and corporate tax, and find an unlevered beta of 1.10[216]. Finally, beta has been adjusted according to a Bloomberg method where weights are assigned to push the estimate towards one[217]. The rational for this technique, is the notion that betas tend to move towards one over time[218]. The final adjusted unlevered beta, based on the average across methods is 1.07. I believe this is more realistic estimate than the output from the regression, as Tesla will become less risky overt time. However, I acknowledge that the beta interval from 0.72 to 1.31 increases the chance of estimation errors. The sensitivity of the share price to beta will therefore be analysed in chapter 9.

7.1.3 Equity risk premium

Equity risk premium is the return in excess of the risk free rate that shareholders expect as compensation for taking on the risk of investing in other assets than the risk free Treasury bond. There are three main methods to estimate the premium: 1) Gather a number of estimates from investors and taking the average, 2) Calculate the ex-post excess return based on historical data and 3) Calculate the implicit ex-ante premium based on current stock prices[219]. The ex-post approach is the most widely used. Various practitioners have compared the actual returns earned on stocks over time and compared this to the actual returns on a risk free security[220]. Koller et al. (2010) argues that 4.5 to 5.5% is an appropriate range[221]. However, such results tend to vary significantly due to differences in choice of time period and risk free security. Fernandez et al. (2012) surveyed the equity risk premium used in 82 countries and found the median estimate for the U.S. to be 5.4%[222]. Similarly, Damodaran continuously updates his estimates and provides an equity risk premium of 5.5% for the S&P500 in March 2014[223]. Thus, the average of 5.5% is a reasonable estimate for the market premium.

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[215] Damodaran, A. (2014), Dataset – Betas by Sector
[216] $\beta_L = (1 + (1 - T) * \frac{D}{E}$
[217] Adj. Beta = regression beta*(2/3) + 1*(1/3)
[218] Damodaran, A. (2009), "Estimating Risk Parameters"., p. 11
[219] Petersen & Plenborg (2012), Financial Statement Analysis, p. 263
[220] Damodaran, A. (2012), "Equity Risk Premium", p. 5.
[221] Koller, T. Goedhart, M. And Wessels, D. (2010), Valuation p. 245
[222] Fernandez et al. (2012), Marker risk premium used in 82 countries in 2012.
[223] Damodaran, A. (2014), Dataset – ERP by Month

7.1.4 Liquidity premium

The last factor included in the expected return of equity is the premium received for illiquidity, which refers to the cost of converting securities to cash. Tesla's trade volume has been relatively high since 2013. The ownership structure is also highly dispersed, which increases the liquidity of the stock. As a result, I do not assign a liquidity premium to Tesla's shares.

7.2 Cost of debt, r_d

Creditors require a return above the risk free rate to fund a company. The rate is based on operational and financial risk and is calculated as the credit spread above the risk free rate that is based on the credit rating assigned to the company[224]. Since the rate reflects the costs that the company can borrow at today, estimation should be based on the current yield of outstanding bonds[225].

Large corporations usually have more than one category of debt, which should be assigned different rates depending on seniority and collateral[226]. However, since Tesla's bonds are convertible, yields depend mostly on stock movements as debt is directly tied to stock-conversion. The yield is therefore not indicative of Tesla's actual costs of debt.

Standard & Poor's recently assigned Tesla's bonds a B- rating due to elevated risk of default. According to S&P, a B-rating suggests that a company is "more vulnerable to adverse business, financial and economic conditions but currently has the capacity to meet financial commitments"[227]. Based on my assessment of risk, in relations to the fundamental beta and the previous liquidity analysis, this rating supports my view. Plenborg & Petersen (2012) argues that a B- rated obligation can be assigned a credit spread between 3.2% and 13.1%[228]. Damodaran (2014) assigns a credit spread of 7.25% for large manufacturing firms (market cap. above USD 5 billion) with B3/B- rating[229]. This estimates lie well within Petersen & Plenborg's interval. In appendix 7.2, I have created a synthetic credit rating to illustrate the reasoning for Tesla's assigned junk bond rating.

Adjusting for the risk free rate, this gives a required return on straight debt of 10.06%.

7.2.1 Tax rate

Free cash flows are forecasted on an after tax basis and the costs of capital must be adjusted accordingly. Tesla has historically operated with negative operating cash flows, and only been subject to an average tax rate below 1% over the past five years. Applying the effective tax rate is therefore inconvenient for

224 Petersen & Plenborg (2012), Financial Statement Analysis, p. 265
225 Sørensen, O. (2012), Regnskabsanalyse og værdiansættelse, p. 48
226 Petersen & Plenborg (2012), Financial Statement Analysis, p. 274
227 Standard & Poor´s (2014)
228 Petersen & Plenborg (2012), Financial Statement Analysis, p. 291
229 Damodaran, A. (2014), Dataset – Estimating country risk premium

estimating the future tax rate. As Tesla operates under different national tax laws, I have used the global average tax rate of ~25% for tax allocations. I also assume that the effective tax rate will adjust to the marginal rate when EBIT turns positive.

7.3 Long-term capital structure

The final stage in the process of estimating WACC is determining the long-term relationship between debt and equity. To estimate the weight of the two components, it is important to use market values to represent expected future returns[230]. Since the market value of debt is unknown, the book value of net interest bearing debt is therefore used as an approximation[231]. The true value of equity is also unknown, in which the observed market value is used[232].

Tesla has historically relied on equity financing, although the capital structure has been subject to changes since the IPO. During the first quarter of 2014, the company raised USD 2 billion in convertible bonds - their most significant debt offering so far. However, during the same period, share prices also rose sharply (figure 1.1).

Using the current market value of equity as an approximation leads to a circularity issue. This compromises my objective of challenging the existing share price. In the derivation of a steady-state capital structure, I have instead benchmarked the capital structure of comparable firms[233]. Tesla states in their annual report that the leverage ratio will depend on the cash flows the firm generates in the future. Thus, the company does not opt for a target ratio. The average debt ratio for peers over the period is 52.4%. However, as can bee seen from figure 7.3, levels vary significantly between companies, as a result of economic cyclicality and institutional differences.

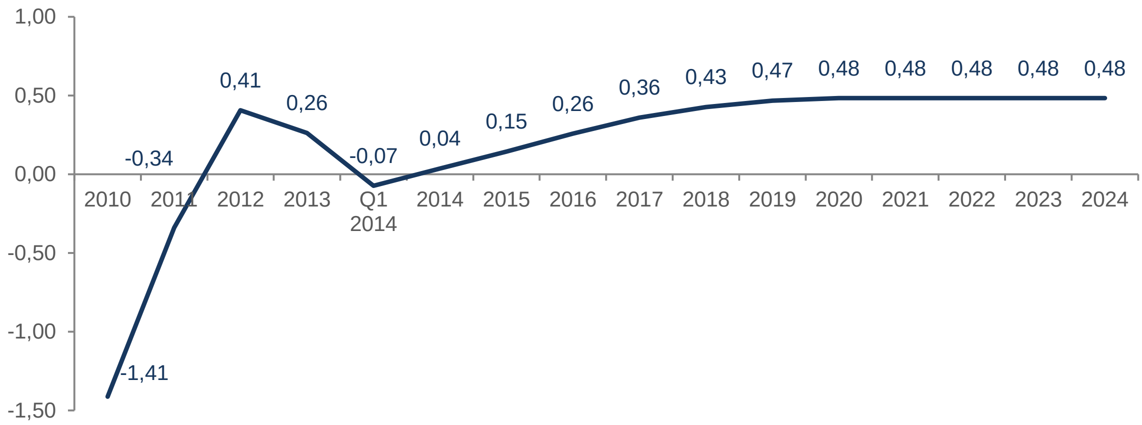
Table 7.2: Peers Capital Structure

	2009	2010	2011	2012	2013	Avg. Hist.
GM	35,3 %	23,8 %	26,2 %	30,3 %	45,6 %	32,2 %
Toyota	53,4 %	53,2 %	52,1 %	52,6 %	51,8 %	52,6 %
Ford	106,3 %	100,6 %	86,9 %	86,6 %	81,1 %	92,3 %
BMW	75,5 %	72,3 %	71,5 %	69,4 %	66,4 %	71,0 %
Audi	5,2 %	6,8 %	8,5 %	27,8 %	21,8 %	14,0 %
						52,4 %

[230] Koller, T. Goedhart, M. And Wessels, D. (2010), Valuation, p. 262
[231] Petersen & Plenborg (2012), Financial Statement Analysis, p. 246
[232] The objective of this analysis is to challenge (or confirm) the value of equity.
[233] Petersen & Plenborg (2012), Financial Statement Analysis, p. 247

To address this issue, Petersen & Plenborg (2012) suggests expanding the sample size[234]. I have therefore compared the average debt ratio of peers to the industry in general. Based on 26 companies world wide, Damodaran (2014) estimate the industry average debt ratio to 48.4%.[235]. In 2012 and 2013, Tesla's NIBD/EV was 41.1% and 26.2%, respectively[236]. I believe 48.4% is the best approximation for Tesla's future capital structure. In Q1 2014, NIBD was negative due to a significant amount of cash equivalents. As mentioned in the liquidity analysis, these cash holdings are expected to be invested in the Gigafactory by the end of 2014. Beginning in 2015, I expect the capital structure to approach the industry level as Tesla utilizes its debt capacity. Over the subsequent years of the forecast period, debt levels will increase and end at the industry normal of 48.4% debt and 51.6% equity.

Figure 7.3 : Tesla Debt/EV



Based on the CAPM model and the inputs estimated above, WACC can be calculated. The required return on equity is 8.65% based on an unlevered beta of 1.07. With a pre-tax cost of debt of 10.06%, I estimate a WACC of 8.12%.

$$WACC = \frac{0.484}{(0.484 + 0.516)} \times 0.1006 \times (1 - 0.25) + \frac{0.516}{(0.484 + 0.516)} \times 0.0865$$

234 Petersen & Plenborg (2012), Financial Statement Analysis, p. 247
235 Damodaran, A. (2014) – Data Set - Debt Fundamentals by Sector
236 Based on average measures.

8.0 Valuation

8.1 Discounted Cash Flow Model (DCF)

This chapter will start with an explanation of the chosen valuation model, followed by a valuation of Tesla Motors based on the previous analysis.

The purpose of an equity valuation model is to obtain the fundamental value of the equity and thus challenge or support the market value of a company. Since the value of a stock depend on the company's future earnings potential, the valuation model aim to estimate the present value of uncertain future cash flows. The discounted cash flow model is a commonly used valuation model. The theoretical background for this model is elaborated on in methodology section. In the calculation of FCFF, I use the WACC from chapter 7, equal to 8.12%. The complete pro forma statements can be found in appendix 6.6.

Table 8.1 Discounted Cash Flow Model, USD 1,000

DCF Valuation	**FY 2013**	**FY 2014**	**FY 2015**	**FY 2016**	**FY 2017**	**FY 2018**	**FY 2019**	**FY 2020**
FCFF		(250 238)	(731 531)	(383 782)	(745 794)	42 877	115 648	342 152
Discount factor		0,92	0,86	0,79	0,73	0,68	0,63	0,58
PV of FCFF		(231 454)	(625 826)	(303 680)	(545 834)	29 025	72 411	198 149
PV of FCFF explicit foecast	(1 407 209)							
PV of FCFF, fade period	1 973 347							
PV of FCFF, terminal	21 581 413							
Enterprise Value 31/3-14	**22 583 855**							
NIBD	(136 802)							
Equity Value	**22 720 657**							
Shares outstanding, 1000	123 473							
Share price, USD	**184,01**							

DCF Valuation	**FY 2013**	**FY 2021**	**FY 2022**	**FY 2023**	**FY 2024**
FCFF		919 044	1 339 331	1 783 938	1 938 376
Discount factor		0,54	0,50	0,46	11,13
PV of FCFF		492 289	663 563	817 494	21 581 413
PV of FCFF explicit foecast	(1 407 209)				
PV of FCFF, fade period	1 973 347				
PV of FCFF, terminal	21 581 413				
Enterprise Value 31/3-14	**22 583 855**				
NIBD	(136 802)				
Equity Value	**22 720 657**				
Shares outstanding, 1000	123 473				
Share price, USD	**184,01**				

The estimated FCFF is negative in the first four years, reflecting the CAPEX requirements and higher fixed costs related to the expansion of existing and new vehicle platforms, expansion of stores and infrastructure, and the construction of the Gigafactory. With the launch of Gen 3, Tesla will begin to reap the profits from these investments. The non-linearity in cash flow growth is an effect of the step-changes in revenue growth, from the introduction of new automotive platforms. It is also worth mentioning that the enterprise value is almost the same as the equity value, as Tesla has more cash than interest bearing debt due to the proceeds from their last bond offering.

The enterprise value is USD 22.58 billion, representing the value of all future cash flows. By deducting net interest bearing debt, I find the free equity value. On the 31.03.2014, Tesla had 123.472,8 shares outstanding. This gives a fundamental equity value per share of USD 184.01. On that same day the stock traded at a price of USD 208.45 at Nasdaq Stock Exchange. I therefore believe the stock should trade 13% lower.

It is evident from the DCF model that cash outflows in the first four years gives a negative present value of the explicit forecast period. This is, however, offset by positive cash flows in the second forecast period 2021to 2023. Still, only 4% of Tesla's value comes from the forecast period. The significant impact of the terminal value is addressed in a sensitivity analysis in chapter 9.

8.2 Economic Value Added (EVA)

The EVA model is based on the notion that the value of a company is determined by the initial amount of invested capital and the present value of future EVAs[237]. The theoretical background for the model is described in 1.3.4. The EVA model is based on the same assumptions and inputs as the DCF and will therefore yield the same result. The difference is that while the DCF uses cash flows, EVA uses NOPAT and adjusts for WACC directly. The result of the valuation can bee seen from table 8.2.

Table 8.2: Economic Value Added Model, USD 1,000

EVA Valuation	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
Invested Capital	691 724	880 846	1 700 834	2 370 271	3 584 316	4 201 588	5 253 988	6 567 656
NOPAT	(63 503)	(61 116)	88 457	285 655	468 252	660 149	1 168 049	1 655 819
EVA		(117 256)	16 968	147 617	275 883	369 250	827 053	1 229 412
Discount factor		0,92	0,86	0,79	0,73	0,68	0,63	0,58
PV of EVA		(108 454)	14 516	116 807	201 914	249 961	517 841	711 985
PV of EVA, explicit forecast	1 704 571							
PV of EVA, fade period	2 167 404							
PV of EVA, terminal	17 583 851							
Invested Capital, t 0	691 724							
Enterprise value1/1-14	22 147 550							
Enterprise Value 31/3-14	**22 583 855**							
NIBD	(136 802)							
Equity Value	**22 720 657**							
Shares outstanding, 1000	123 473							
Share price, USD	**184,01**							

237 Petersen & Plenborg (2012), Financial Statement Analysis, p. 220

EVA Valuation	FY 2013	FY 2021	FY 2022	FY 2023	FY 2024
Invested Capital	691 724	7 552 804	8 308 084	8 723 488	9 072 428
NOPAT	(63 503)	1 904 192	2 094 611	2 199 342	2 287 316
EVA		1 371 169	1 481 635	1 525 068	1 579 327
Discount factor		0,54	0,50	0,46	11,13
PV of EVA		734 471	734 067	698 866	17 583 851
PV of EVA, explicit forecast	1 704 571				
PV of EVA, fade period	2 167 404				
PV of EVA, terminal	17 583 851				
Invested Capital, t 0	691 724				
Enterprise value1/1-14	22 147 550				
Enterprise Value 31/3-14	**22 583 855**				
NIBD	(136 802)				
Equity Value	**22 720 657**				
Shares outstanding, 1000	123 473				
Share price, USD	**184,01**				

In the first year of forecasting, EVA is negative. This illustrates that Tesla initially destroys shareholder value. This changes in year 2. Compared to DCF, the forecast period contributes with 9% of enterprise value.

8.3 Relative Valuation - Multiples

Valuation based on multiples is not theoretically reasoned, and therefore will receive only limited attention in this dissertation. The method is, however, implemented, to provide an objective idea of the price range in which the Tesla stock should lie. The use of the right multiples is essential for the validity of multiples. According to Koller et. al. (2010), EV/EBIT tells more about the company than any other multiple, as it incorporates growth rates, ROIC, tax and cost of debt[238]. Since manufacturers have different depreciation schemes, I have also used EV/EBITDA. EV/Sales are only useful for companies with volatile earning and situations when earnings fail to represent long-term potential[239]. I believe this is the case for Tesla, and have therefore included the multiple.

Empirical evidence suggests that forward-looking multiples are more accurate than historical multiples[240]. For comparable companies, I have used 2014 and 2015 multiples. For Tesla, I have also included multiples for 2020, to reflect the full impact of Model S, Model X and Gen 3. The forward-looking multiples are gathered from Bloomberg and presented in table 8.4.

Based on my valuation of Tesla, all multiples are significantly higher than the industry average in 2014 and 2015. In 2014, Tesla's price is 7.1 times the estimated sales, compared to the industry multiple of 0.9. This means, that Tesla is much more expensive than its peers. The high premium above the industry is justified by the high growth over the period, which is already price in by the market. During 2015, I expect EBIT to turn

[238] Koller, T. Goedhart, M. And Wessels, D. (2010), Valuation. p. 305
[239] Koller, T. Goedhart, M. And Wessels, D. (2010), Valuation. p. 317
[240] Koller, T. Goedhart, M. And Wessels, D. (2010), Valuation. p. 311

positive. EV/EBIT therefore changes from being insignificant in 2014, to significantly high in 2015. All multiples fall from 2014 to 2015, as sales, EBITDA-margin and EBIT-margin increases. The same development is true for pees, indicating that most analysts expect the industry to grow over the year.

Table 8.4: Multiples Valuation

Comparables	**EV/Sales**		**EV/EBITDA**		**EV/EBIT**	
	2014	**2015**	**2014**	**2015**	**2014**	**2015**
Toyota	1.3x	1.2x	9.6x	8.7x	13.5x	12.4x
GM	0.3x	0.2x	3.5x	2.5x	7.3x	4.1x
Ford	0.4x	0.4x	6.1x	4.5x	12.3x	7.1x
Mass-market average	0.7x	0.6x	6.4x	5.2x	11.0x	7.9x
BMW	1.5x	1.4x	9.5x	8.9x	13.8x	13.3x
Audi	N/A	N/A	N/A	N/A	N/A	N/A
Premium average	1.5x	1.4x	9.5x	8.9x	13.8x	13.3x
Peer Average	0.9x	1.0x	7.2x	6.2x	11.7x	9.2x

Tesla	**2014**	**2015**	**2020**
EV/Sales	7.1x	4.2x	1.1x
EV/EBITDA	445.1x	64.5x	7.4x
EV/EBIT	N/A	191.5x	10.2x

Source: Bloomberg

The 2020 multiples are much more indicative of Tesla´s value. By this time, Tesla should have capitalized on all planned projects. Beyond this point, growth should stabilize. In 2020, I have estimated an EV/EBITDA of 7.4x, an EV/EBIT of 10.2x and an EV/Sales of 1.1x.

With the price I have estimated, Tesla trades at a slight premium measure by all three multiples. However, their presence in the high-end segment, should explain the premium in 2020, when looking at high-end manufacturer BMW. Based on the multiples for 2020, my estimate seems fair.

Lastly, I have compared my estimated multiples for 2014 and 2015 with the Bloomberg consensus. The consensus estimate is illustrated in appendix 8.2, and indicates that my forecast is below average on EV/EBIT and EV/EBITDA. This difference can be explained by my conservative estimation of this year's profit margin. I believe the company is more expensive than the analyst consensus, due to the capital intensity of the industry and the even higher capital requirements for Tesla. I also believe that SG&A expenses will be high through the year and in 2015, which will pressure margins and limit returns over the period. The relative conservatism of my estimate indicates that the potential for upside limited. However, due to the following factors, I believe my estimates are reliable.

Tesla is first of all an automotive manufacturer, and subject to the structural characteristics of the industry: capital intensity, high fixed costs, high leverage and intense competition. I see Tesla as a strong player in the premium EV segment and in the premium segments as a whole. Tightening emission policies, rising fuel prices and economic growth, lays the foundation for Tesla to grow sales and increase their market share.

Coupled with impeccable product quality, technological leadership and the ability to execute, I see little potential for failure. However, while I believe in the future of Tesla and their vehicles, I also believe that the company is overvalued compared to industry peers.

9.0 Sensitivity Analysis

The DCF and EVA valuation is based on parameter estimates and assumptions, which is vitiated by subjectivity and uncertainty. In this chapter, I will perform a sensitivity analysis of the estimated fundamental value. The terminal value accounts ~96% of the total enterprise value. Thus, the share price is highly sensitive to the terminal growth rate. The same is true for the estimated costs of capital, as it is used to discount all future cash flows to the present value.

The terminal growth rate of 4% is based on the expected aggregate growth of the economy. According to IMF (2014), the economy will expand at a rate of 2-4% over the next five years[241]. Developed economies are facing low inflation, while developing countries continue to grow. This makes it difficult to forecast growth rates far out in the horizon. In table 9.1, I have tested the sensitivity of the estimated share price to changes in the growth rate and WACC. A change of 0.5% in terminal growth would change the price with USD ~20 in either direction. The estimated share price is also sensitive to the estimated costs of capital, which is based on several underlying assumptions and estimations. While I have estimated WACC based on well-known theories, I acknowledge the possibility of errors in my estimation.

Table 9.1

Terminal growth (H) and WACC (V)

	2,5 %	3,0 %	3,5 %	**4,0 %**	4,5 %	5,0 %	5,5 %
6,6 %	135,9	148,6	164,1	183,3	207,9	240,3	285,2
7,1 %	136,1	148,8	164,3	183,6	208,2	240,6	285,5
7,6 %	136,2	149,0	164,5	183,8	208,4	240,9	285,9
8,1 %	136,4	149,2	164,7	184,0	208,7	241,2	286,2
8,6 %	136,6	149,4	164,9	184,2	208,9	241,5	286,6
9,1 %	136,7	149,5	165,1	184,5	209,2	241,8	286,9
9,6 %	136,9	149,7	165,3	184,7	209,4	242,1	287,2

Table 9.2

Adj. Beta (H) and Risk free rate (V)

	0,92	0,97	1,02	**1,07**	1,12	1,17	1,22
1,31 %	370,0	345,1	322,9	303,0	285,0	268,7	253,9
1,81 %	300,9	283,1	267,0	252,3	238,8	226,5	215,2
2,31 %	250,7	237,4	225,2	213,9	203,5	193,9	185,0
2,81 %	212,7	202,4	192,9	184,0	175,8	168,1	160,9
3,31 %	183,0	174,9	167,2	160,1	153,4	147,1	141,2
3,81 %	159,3	152,6	146,4	140,5	135,0	129,8	124,8
4,31 %	139,9	134,4	129,2	124,3	119,6	115,2	111,1

241 International Monetary Fund (2014), ”Recovery Strengthens, Remains Uneven”. World Economic Outlook. p. 187

The sensitivity to WACC can be measured by segregating its component. In table 9.2, I have tested the price sensitivity to beta and the risk free rate. It is evident from table 9.1, that Tesla's share price is less sensitive to small changes in WACC. However, WACC seems highly sensitive to changes is beta and the interest rate, which will in turn affect the price. Only a small change of 0.05 in systematic risk, changes the price with USD ~10. To limit sourcing errors, beta has been estimated as the average of different methods. Based on the results from the different approaches, and the beta estimates for comparable companies, I believe the estimate of beta is valid.

As previously mentioned, the interest rates in developed economies are currently lower than the historical rate. Acknowledging this, I have estimated the risk free interest rate from the 6-year average to limit the possibility of overestimating the value of company. As can be seen from table 9.2, Tesla's stock price is highly sensitive to the interest level. With interest rates at a historical low, I believe there is a possibility that rates will rise.

Table 9.3

Battery cost reduction	Share price	EBITDA-margin	Share price
-6,5 %	251,2	13,0 %	154,2
-6,0 %	230,0	13,5 %	164,2
-5,5 %	208,1	14,0 %	174,1
-5,0 %	184,0	14,5 %	184,0
-4,5 %	162,2	15,0 %	193,9
-4,0 %	138,1	15,5 %	203,9
-3,5 %	113,4	16,0 %	213,8

One of the key drivers of Tesla's value is the development of battery costs. My estimation assumes a negative compounded annual growth rate of 5% in battery costs from 2014 to 2020. The uncertainty regarding the future of battery electric vehicles and the supply of lithium makes this particular estimate interesting to test for validity. Should battery costs "only" decline by 4% annually, the estimated value would fall by more than USD 40. To overcome the supply constraint of battery cells, Tesla is building their own battery plant. Still, there is a possibility that this will take longer than expected and that battery metals may be difficult to source. If this occurs, the company will likely experience a deterioration of the business and the value of their shares.

The company's negative operating result can to a large extent be explained by high fixed costs. The estimated profit margin is based on the assumption that these costs will decrease and be offset by higher revenues going forward. The profit margin in the terminal period is also based on the assumption that Tesla will continue to be a player in the premium segment, and therefore enjoy the margins of comparable premium manufacturers. If the products mix changes in favour of Gen 3 at the expense of the more expensive Model S/X, profit margins will be affected. As shown in table 9.3, a 1% change in EBITDA-margins changes the share price by USD ~20.

10.0 Conclusion

The objective of this thesis was to determine the fair value one Tesla Motors share per 31.03.2014, and thus challenge the current market price. The company was chosen because it offers an interesting case for a fundamental valuation. Tesla has many of the characteristics of a growth company, with negative operating income and high investments. They also have many of the characteristics of a disruptive company, as they have aggressively gone head-to-head with large and resourceful industry peers to create a mass-market for electric vehicles.

Over that last year, the company grew revenues by ~500% and the stock price followed on with a 52-week rage of USD 37.9 – 254.8. Over the last 12 month, Tesla delivered capital gains of ~450%[242]. Yet, on every measure of profitability, Tesla has delivered negative results since 2010.

Tesla's growth depends on macroeconomic factors, such as the development of GDP, oil prices and the development of battery costs. Battery costs constitute a major hurdle that Tesla has to overcome in order to drive electric vehicle adoption. Tesla also depends on factors within the company's control, such as the expansion of stores and charging network. As a new player in a capital intense industry, Tesla will need to invest heavily in growth, in order to obtain a critical scale. Most of these investments will be allocated to the new Gigafactory, a battery cell factory that is expected to secure sufficient supply of Lithium-ion battery cells to their upcoming Gen 3 vehicle and also reduce the battery cost by 30%.

In the process of estimating future cash flows, I have focused on production capacity, capital investments and battery costs, as my analysis showed that these factors are critical drivers of value over the next years. With the introduction of two new vehicle platforms, I believe growth will come in two increments. I estimate unit sales of ~398,000 and an EBITDA-margin of 14.5% by 2020. My valuation shows that one Tesla share is worth USD 184.01. At the day of the valuation, shares traded at USD 208.5, which implies that there is limited upside to the valuation. This is also supported by industry multiples, which suggests that Tesla is relatively expensive. The current market price also indicates that the market has already priced in most of the company's future profitability. Lastly, my sensitivity analysis showed that the share price is highly sensitive to the development of battery costs.

The estimated share price is below the average consensus, which may indicate a conservative estimate. However, given the capital intensity of the industry and the Tesla's aggressive growth strategy, I see validity in my estimate.

242 $\frac{P_1 - P_0}{P_0}$

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12.0 Appendix

Appendix 1.1: Management Team

Elon Musk, Co-Founder, CEO and Product Architect

Elon Musk is the CEO and Product Architect of Tesla Motors. He oversees all development and design of Tesla´s vehicles. Prior to Tesla, he co-founded PayPal, which were sold to Ebay in 2002 for $1.5bn[243]. His visionary leadership has given Tesla significant attention as a company. Much like Steve Jobs, his leadership is characterised by a desire to revolutionize the industry. In an interview on 60 minutes, Musk states:

Well, I didn´t really think Tesla would be successful. I thought we would most likely fail. But I though that we at least could address the false perception that people have that an electric car had to be ugly and slow and boring like a golf cart. Elon Musk, 2014

Musk´s key passion is sustainable energy. He is also the CEO of Space Exploration Technologies (Space X) and the chairman of SolarCity. His appetite for risk makes him well suited to lead Tesla for the next years as it goes through the transition from a luxury electric carmaker to mainstream electric cars. The ability to take risk could enable

JB Straubel, CTO

Straubel is the co-founder of Tesla Motors. He oversees the technical and engineering design. Prior to Tesla, he co-founded Volacom, a aerospace company that developed an electric aircraft platform. At Volacom, Straubel invented a hybrid-electric propulsion concept that was licenced to Boing[244].

Deepak Ahuja, CFO

Ahuja has been CFO since 2008. Prior to joining Tesla Motors, he was a controller at Ford North America and before that the CFO of Ford Southern Africa[245].

Franz von Holzhausen, Chief Designer

Holzhausen is the Chief Designer at Tesla Motors, responsible for establishing design concepts for vehicles. Prior to Tesla, he was the Director of Design at Mazda North America and before that the Design Director at General Motors[246].

Gilbert Passin, VP Manufacturing

243 http://news.cnet.com/2100-1017-941964.html
244 ir.teslamotors.com/management
245 ir.teslamotors.com/management
246 ir.teslamotors.com/management

Passin is the Vice President of manufacturing of Tesla Motors. He has 23 years of automotive experience, and has launched several successful Toyota vehicles. Passin has an engineering degree from Ecole Centrale de Paris and has been a lecturer in Engineering at the University of Bath, U.K[247].

George Blankenship, VP Worldwide Retail

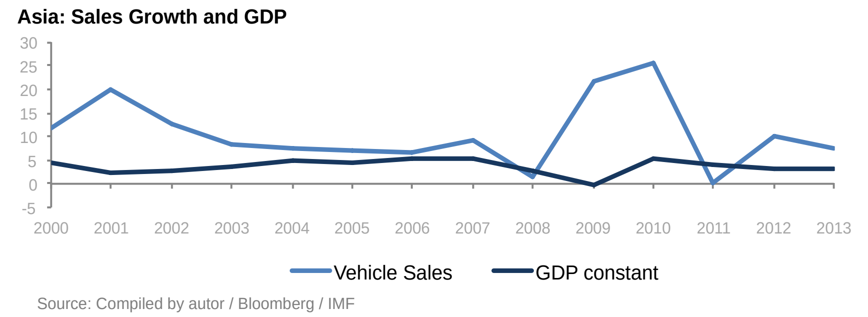
Blankenship became Vice President of worldwide retail at Tesla Motors in 2013. He has previously been credited for being the architect of Apple´s brand building retail strategy. Blankenship attended the University of Delaware[248].

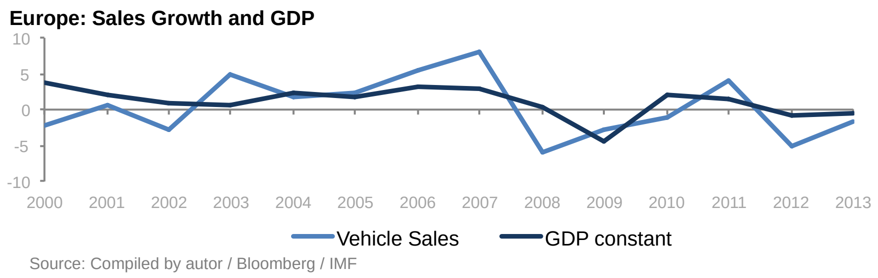
247 ir.teslamotors.com/management

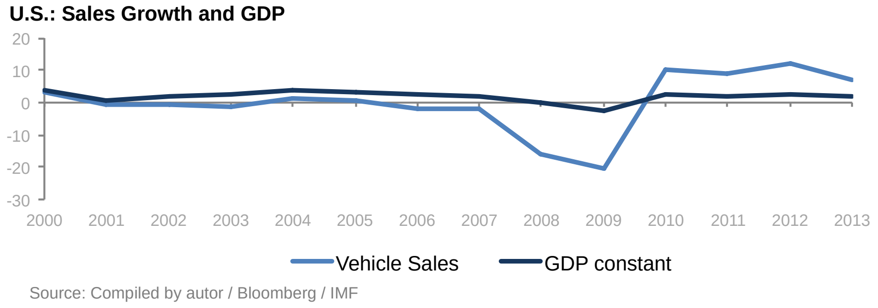
248 ir.teslamotors.com/management

Appendix 3.1 Correlation between vehicle sales and GDP in selected economies

Source: Compiled by author / IMF / Bloomberg

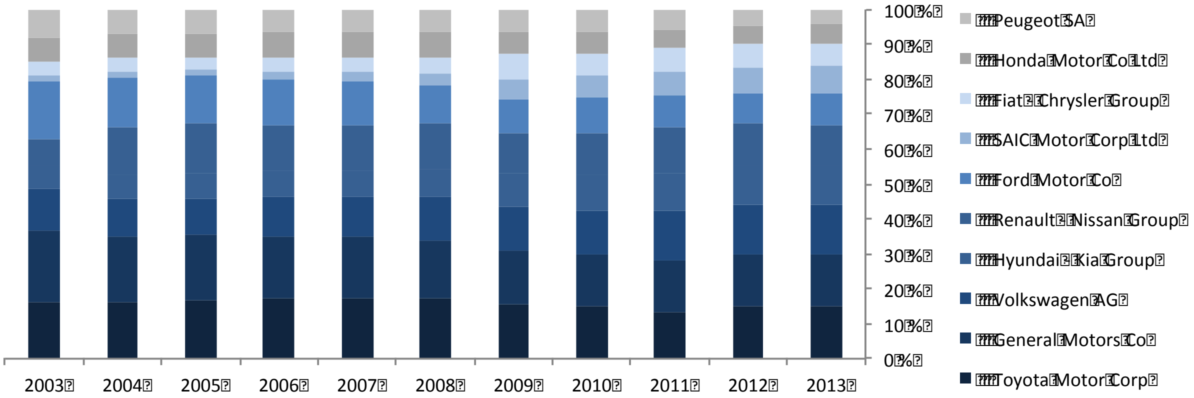






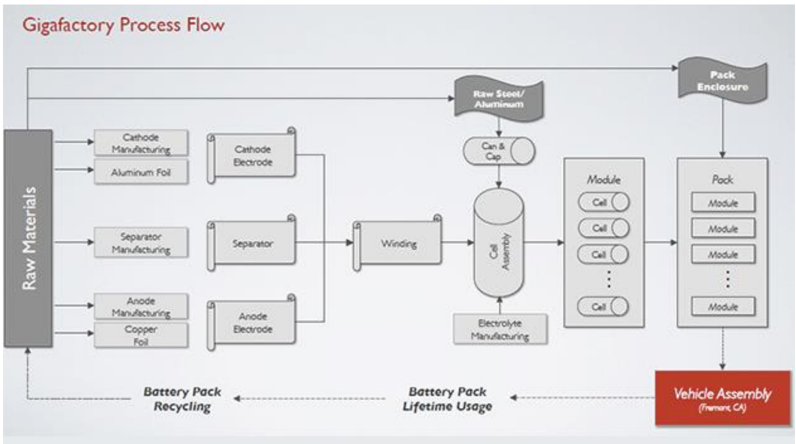
Appendix 3.2 – Market shares of the ten largest players have remained constant since 2003.

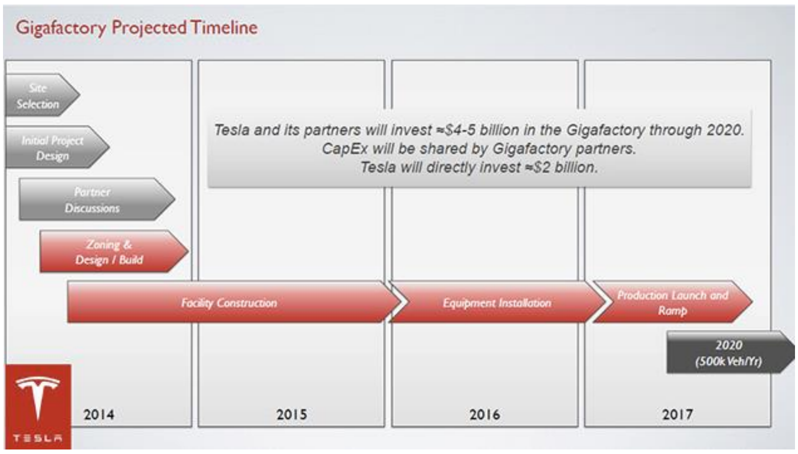
Source: Compiled by author / Bloomberg



Appendix 3.3 – Gigafactory process flow and timeline

Source: teslamotors.com





Financial Statement Analysis
Appendix 4.1 – Peer group selection
Source: Compiled by author / Company reports and websites

For the purpose of analysing Tesla´s performance over the period from 2009 to 2013, I have defined a peer group. The group will be used as a benchmark throughout the financial analysis and part of the strategic analysis and for the multiples valuation.

When selecting the peer group, several factor have been taken into considerations. According to Petersen & Plenborg (2012), peers need to have similar operations and business, and the financial statements should be based on the same accounting standards and have a similar risk profile.[249] For comparison of multiples, peers should have a similar outlook for long-term growth.

Tesla has a unique business structure. Its competitors in the industry are large and mature while Tesla´s business model is relatively new. This makes finding comparable companies difficult. Tesla is a global company and the choice of a global peer group was therefore only natural. The question of whether Tesla will evolve ass a niche premium manufacturer or eventually become a mass-market play, is still unknown. Telsa´s objective is to take on the premium market before entering the mass-market with their Gen 3 model. I have therefore chosen a peer group who operates in both segments.

Comparison factor	Tesla	BMW	Audi	Ford	GM	Toyota
Premium segment	✔	✔	✔			
High-end mass-market		✔	✔	✔	✔	✔
Portfolio includes Evs	✔	✔	✔	✔	✔	✔
Premium Evs	✔					
High-end mass-market Evs		✔	✔	✔	✔	✔
Global market	✔	✔	✔	✔	✔	✔
Risk profile	✔	✔	✔	✔	✔	✔
U.S. GAAP	✔			✔	✔	✔
Nasdaq Stock Exchange listed	✔					

[249] Petersen & Plenborg (2012), Financial Statement Analysis, p. 64

Appendix 4.2: Reformulated income statement and balance sheet for Tesla and peers

Source: Annual Reports from 2009-2013 and Q1 2014; Bayerische Motoren Werke AG (BMW), Audi AG (Audi), Toyota Motor Corporation (Toyota), Ford Motor Company (Ford) and General Motors Company (GM).

All financial statements have been reformulated based on the structure and method of Petersen & Plenborg (2012) unless otherwise stated. The reformulation of Tesla´s income statement and balance sheet is described in chapter 4. The reformulation of the peer group has been made based on the same approach, and will be commented on in the following appendix.

The chosen peer group use different accounting standards. These include U.S. GAAP, IFRS and Japanese GAAP. In some areas, I have found it valuable to make correction (such as in the reporting of R&D) to increase the comparability with Tesla. However, due to the lack of details and the scope of this paper, it is not possible to correct them all. While I am aware that these differences may lead to less than optimal comparisons, I do believe a proper benchmark analyses can be made.

Many OEMs have captive financial services operations in addition to the core vehicle (industrial) business. This includes automobile financing, leasing and insurance. Since these subsidiaries charge interests, they resemble banks. According to Koller et al. (2010), banks are valued differently than manufacturing firms. Line items from this part of the business should therefore be separated from the calculation of invested capital and from the operating result[250]. The financial analysis of the company and peers, are therefore based on financial statements of core industrial operations, which is the dominant business.

EBITDA is not reported under IFRS and U.S. GAAP. As I have chosen to use before-tax ratios in the financial analysis, I have calculated EBITDA. For all peers, research and development and depreciation and amortization is recognized as cost of revenues. In order to perform a common-size analysis and to compare the cost structure of each respective company, these items are added back to COGS and deducted from gross profits. This results in a higher operating result and unchanged net result.

Due to the difficulty of separating operating cash from excess cash, cash and cash equivalents are recognized as financial assets.

[250] Koller, T. Goedhart, M. And Wessels, D. (2010), Valuation, pg. 143

BMW

The Analytical Income Statement

- BMW report according to IFRS and includes R&D expenses under costs of sales. For comparison with Tesla, these are deducted from costs of sales at stated separately on the income statement.

- *Other operating expense/income* includes exchange gains, reversal/additions to provisions, reversal/expense for impairment losses and write-downs, disposal of assets and other operating expenses. These are considered as operating activities and classified as operating expenses/income.

The Analytical Balance Sheet

- *Other financial results* are income from investments in subsidiaries and participations, which is not part of core operations. Changes in financial results for 2013 were primarily due to gains on interest rate and commodity derivatives[251]. The item is therefore classified as a financial item.

- *Results on investments* relate to interest in associated companies[252] and are classified as operating.

General Motors

On July 10, 2009 General Motors applied new accounting standards and stated that all financial information after this date is not comparable with the financial information provided before and on this date[253]. Though I recognize this creates an issue of consistency in the analytical statements, I have exclusively compared ratios from 2010 until 2013. Therefore, I believe this change will have little significance for the analysis.

The Analytical Income Statement

- *Goodwill impairment charges* of USD 27,1bn was recorded in 2012 as a result of the estimated value exceeding the carrying amount for reporting units in North-America, European, Korea, South Africa and GM Holden. In 2012, GM reversed deferred tax assets of UDS 36,2bn for the North-America unit which caused the units carrying amount to exceed its fair value. The exceeding value of the deferred tax asset resulted in less implied Goodwill[254]. Although impairment of Goodwill may occur in the future, the above-average recorded amount in 2012 is more likely a one-time event and is recognized as a non-recurring item.

The Analytical Balance Sheet

In order to ensure consistency in the comparison of operating performance between Tesla and peers, ROIC is measured both with and without goodwill.

[251] BMW Annual Report 2013, p. 116
[252] BMW Annual Report 2013, p. 125
[253] General Motors Annual Report 2010, p. 22
[254] General Motors Annual Report 2012, p. 59

- *Other assets and deferred income taxes* consist mainly of deferred income taxes. Deferred income taxes arise because the firm pays too much in tax, usually when realised earnings are lower than expected. In such it is classified as an operating asset[255].
- *Assets held for sale* are assets that are no longer a part of operations and therefore considered a financial asset. The same is true for *liabilities held for sale*.

Ford Motors

The Analytical Income Statement

- *Other non-operating income (expense), net* is gains/losses on cash equivalents and marketable securities, gain/losses on dispositions and gains/losses on extinguishment of debt. These are recognized as non-recurring items for consistency.

The Analytical Balance Sheet

- *Accrued liabilities and deferred revenue* consist of deferred revenue, dealer/customer claims, other, OPEB, pension and employee benefits. In order to obtain consistency across the peer companies, OPEB, pension and employee benefits are reorganized as financial liabilities. The same is true for *other liabilities* which contain non-current OPEB and benefit liabilities.

Toyota Motors

The Analytical Balance Sheet

- *Investments and other assets* are marketable securities and securities investments, affiliated companies, employee's receivables and other. Toyota does not expand investments and other assets for all years and does not separate between financial services and automobile segment. Therefore, I have recognized the item as operational, for consistency with other peers.

Audi

The Analytical Balance Sheet

- *Investment property* relates to buildings and land leased on the basis of a financial lease agreement[256]. Since financial leases are structured as debt, investment property is classified as a financial asset.
- *Other long-term investments* are investments in nonconsolidated affiliated and associated companies. These are regarded as financial assets according to Koller et al. (2010).

[255] Petersen & Plenborg (2012), Financial Statement Analysis, p. 79.
[256] Audi AG Annual Report 2013, p. 246

Tesla Motors
Analytical Income Statement

USD 1,000

Tesla - Income Statement	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	Q1 2014
Total revenues	**111 943,0**	**116 744,0**	**204 242,0**	**413 256,0**	**2 013 496,0**	**620 542,0**
Automotive sales	111 943,0	97 078,0	148 568,0	385 699,0	1 997 786,0	618 811,0
Vehicle Sales	*103 355,0*	*72 659,0*	*99 008,0*	*313 844,0*	*1 758 184,0*	*590 922,0*
Emission credits	*8 200,0*	*2 800,0*	*2 700,0*	*40 500,0*	*194 500,0*	*11 600,0*
Powertrain components	*388,0*	*21 619,0*	*46 860,0*	*31 355,0*	*45 102,0*	*16 289,0*
Development services	0,0	19 666,0	55 674,0	27 557,0	15 710,0	1 731,0
Revenue by segment						
North America	*90 833,0*	*41 866,0*	*109 233,0*	*355 325,0*	*1 545 413,0*	*288 379,0*
Europe	*21 110,0*	*70 542,0*	*84 397,0*	*50 318,0*	*467 079,0*	*332 108,0*
Asia	*0,0*	*4 336,0*	*10 612,0*	*7 613,0*	*1 004,0*	*55,0*
Total cost of revenues	**(95 468,0)**	**(75 390,0)**	**(125 728,0)**	**(354 364,0)**	**(1 451 151,0)**	**(421 146,0)**
Automotive sales	(102 408,0)	(79 982,0)	(115 482,0)	(371 658,0)	(1 543 878,0)	(462 471,0)
Development services	0,0	(6 031,0)	(27 165,0)	(11 531,0)	(13 356,0)	(2 943,0)
Depreciation	6 940,0	10 623,0	16 919,0	28 825,0	106 083,0	44 268,0
Gross profit, adjusted	**16 475,0**	**41 354,0**	**78 514,0**	**58 892,0**	**562 345,0**	**199 396,0**
Research and development	(19 282,0)	(92 996,0)	(208 981,0)	(273 978,0)	(231 976,0)	(81 544,0)
SG&A	(42 150,0)	(84 573,0)	(104 102,0)	(150 372,0)	(285 569,0)	(117 551,0)
EBITDA	**(44 957,0)**	**(136 215,0)**	**(234 569,0)**	**(365 458,0)**	**44 800,0**	**301,0**
Depreciation	(6 940,0)	(10 623,0)	(16 919,0)	(28 825,0)	(106 083,0)	(44 268,0)
EBIT	**(51 897,0)**	**(146 838,0)**	**(251 488,0)**	**(394 283,0)**	**(61 283,0)**	**(43 967,0)**
Interest income	159,0	258,0	255,0	288,0	189,0	141,0
Interest expense	(2 531,0)	(992,0)	(43,0)	(254,0)	(32 934,0)	(11 883,0)
Net financial expenses						
EBT	**(54 269,0)**	**(147 572,0)**	**(251 276,0)**	**(394 249,0)**	**(94 028,0)**	**(55 709,0)**
Income tax	(26,0)	(173,0)	(489,0)	(136,0)	(2 588,0)	(809,0)
Effective tax rate	-0,05 %	-0,11 %	-0,19 %	-0,03 %	-3,62 %	-1,65 %
Tax on EBIT	(24,2)	(164,8)	(484,3)	(135,4)	(2 220,5)	(726,0)
NOPAT	**(51 921,2)**	**(147 002,8)**	**(251 972,3)**	**(394 418,4)**	**(63 503,5)**	**(44 693,0)**
Net financial expenses	(2 372,0)	(734,0)	212,0	34,0	(32 745,0)	(11 742,0)
Tax shield	(1,1)	(0,8)	0,4	0,0	(1 186,5)	(193,9)
Net income	(54 294,3)	(147 737,6)	(251 759,9)	(394 384,4)	(97 434,9)	(56 628,9)
Total non-recurring items	(1 445,0)	(6 583,0)	(2 646,0)	(1 828,0)	22 602,0	6 718,0
Tax shield in non-recurring items	(0,7)	(7,4)	(5,1)	(0,6)	818,9	110,9
Total Income	**(55 740,0)**	**(154 328,0)**	**(254 411,0)**	**(396 213,0)**	**(74 014,0)**	**(49 800,0)**

Tesla Motors
Analytical Balance Sheet

USD 1,000

Tesla Motors - Balance Sheet	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	Q1 2014
Operational Assets						
Property, plant and equipment	23 535,0	114 636,0	298 414,0	552 229,0	738 494,0	849 389,0
Other assets	2 750,0	22 730,0	22 371,0	21 963,0	23 637,0	36 143,0
Operating lease vehicles, net	0,0	7 963,0	11 757,0	10 071,0	382 425,0	451 729,0
Inventory	23 222,0	45 182,0	50 082,0	268 504,0	340 355,0	450 730,0
Accounts receivable	3 488,0	6 710,0	9 539,0	26 842,0	49 109,0	72 380,0
Prepaid expenses, current assets	4 222,0	10 839,0	9 414,0	8 438,0	27 574,0	48 869,0
Total Operatinal Assets	**57 217,0**	**208 060,0**	**401 577,0**	**888 047,0**	**1 561 594,0**	**1 909 240,0**
Operational Liabilities						
Resale value guarantee	0,0	0,0	0,0	0,0	236 299,0	290 617,0
Other long-term liabilities	3 459,0	12 274,0	14 915,0	25 170,0	58 197,0	70 969,0
Accounts payable	15 086,0	28 951,0	56 141,0	303 382,0	303 969,0	375 778,0
Accrued liabilities	14 532,0	20 945,0	32 109,0	39 798,0	108 252,0	128 674,0
Deferred development compensation	156,0	0,0	0,0	0,0	0,0	0,0
Reservation payments	26 048,0	30 755,0	0,0	0,0	0,0	0,0
Customer deposits	0,0	0,0	91 761,0	138 817,0	163 153,0	198 006,0
Total Operational Liabilities	**59 281,0**	**92 925,0**	**194 926,0**	**507 167,0**	**869 870,0**	**1 064 044,0**
NWC	**(28 349,0)**	**(30 194,0)**	**(125 891,0)**	**(203 383,0)**	**(452 832,0)**	**(492 065,0)**
∆ NWC		(1 845,0)	(95 697,0)	(77 492,0)	(249 449,0)	(39 233,0)
Invested Capital	**(2 064,0)**	**115 135,0**	**206 651,0**	**380 880,0**	**691 724,0**	**845 196,0**
Financial Liabilities						
Capital lease obligations, current	290,0	279,0	1 067,0	4 365,0	7 722,0	8 397,0
Convertible debt, current	0,0	0,0	0,0	0,0	182,0	589 875,0
Long-term debt, current	0,0	0,0	7 916,0	50 841,0	0,0	0,0
Deferred revenue	1 377,0	4 635,0	2 345,0	1 905,0	91 882,0	112 740,0
Total short-term debt	**1 667,0**	**4 914,0**	**11 328,0**	**57 111,0**	**99 786,0**	**711 012,0**
Convertible debt	0,0	0,0	0,0	0,0	586 119,0	0,0
Common stock warrant liability	0,0	6 088,0	8 838,0	10 692,0	0,0	0,0
Convertible preferred stock warrant liability	1 734,0	0,0	0,0	0,0	0,0	0,0
Capital lease obligations	800,0	496,0	2 830,0	9 965,0	12 855,0	12 572,0
Long-term debt	0,0	71 828,0	268 335,0	401 495,0	0,0	1 519 967,0
Deferred revenue	1 240,0	2 783,0	3 146,0	3 060,0	181 180,0	210 817,0
Total long-term debt	**3 774,0**	**81 195,0**	**283 149,0**	**425 212,0**	**780 154,0**	**1 743 356,0**
Financial Assets						
Restricted cash	3 580,0	4 867,0	8 068,0	5 159,0	6 435,0	7 102,0
Cash and cash equivalents	69 627,0	99 558,0	255 266,0	201 890,0	845 889,0	2 393 908,0
Short-term marketable securities	0,0	0,0	25 061,0	0,0	0,0	189 111,0
Restricted cash	0,0	73 597,0	23 476,0	19 094,0	3 012,0	1 049,0
Net Interest Bearing Debt	**(67 766,0)**	**(91 913,0)**	**(17 394,0)**	**256 180,0**	**24 604,0**	**(136 802,0)**
Total Equity	**65 702,0**	**207 048,0**	**224 045,0**	**124 700,0**	**667 120,0**	**981 998,0**
Invested Capital (NIBD + E)	**(2 064,0)**	**115 135,0**	**206 651,0**	**380 880,0**	**691 724,0**	**845 196,0**

Bayerische Motoren Werke AG
Analytical Income Statement

EUR million

BMW - Income Statement	**FY 2009**	**FY 2010**	**FY 2011**	**FY 2012**	**FY 2013**
Net Sales	**43 737,0**	**54 137,0**	**63 229,0**	**70 208,0**	**70 629,0**
Cost of Sales	(39 616,0)	(44 703,0)	(50 164,0)	(56 525,0)	(57 771,0)
Depreciation and amortization	3 603,0	3 861,0	3 654,0	3 716,0	3 830,0
Research and development	2 587,0	3 082,0	3 610,0	3 993,0	4 117,0
Gross profit, adjusted	**10 311,0**	**16 377,0**	**20 329,0**	**21 392,0**	**20 805,0**
Selling, General and Administrative Expenses	(4 329,0)	(4 778,0)	(5 260,0)	(5 862,0)	(6 112,0)
Research and development	(2 587,0)	(3 082,0)	(3 610,0)	(3 993,0)	(4 117,0)
Other operating income/expenses	-57	-301	-328	-222	-89
Results on investmnets	42	98	164	271	398
EBITDA	**3 380,0**	**8 314,0**	**11 295,0**	**11 586,0**	**10 885,0**
Depreciation and amortization	(3 603,0)	(3 861,0)	(3 654,0)	(3 716,0)	(3 830,0)
EBIT	**(223,0)**	**4 453,0**	**7 641,0**	**7 870,0**	**7 055,0**
Interest income	560,0	556,0	680,0	353,0	303,0
Interest expence	(1 055,0)	(871,0)	(889,0)	(552,0)	(534,0)
Net financial expenses					
EBT	**(718,0)**	**4 138,0**	**7 432,0**	**7 671,0**	**6 824,0**
Income tax expense (benefit)	149,0	(1 280,0)	(1 832,0)	(2 453,0)	(2 153,0)
Effective tax rate	25,3%	32,9%	26,9%	34,2%	32,8%
Tax on EBIT	56,5	(1 466,4)	(2 051,6)	(2 692,5)	(2 315,1)
NOPAT	**(166,5)**	**2 986,6**	**5 589,4**	**5 177,5**	**4 739,9**
Net financial expenses	(495,0)	(315,0)	(209,0)	(199,0)	(231,0)
Tax shield	125,4	103,7	56,1	68,1	75,8
Net Income before minority interest	**(536,1)**	**2 775,3**	**5 436,5**	**5 046,6**	**4 584,7**
(Income) loss attributable to minority interests	(6,0)	(15,0)	(25,0)	(24,0)	(17,0)
Net Income	**(542,1)**	**2 760,3**	**5 411,5**	**5 022,6**	**4 567,7**
Other financial result	130	-251	-609	-501	-263
Total non-recurring items	130,0	(251,0)	(609,0)	(501,0)	(263,0)
Tax shield on non-recurring items	(32,9)	82,7	163,5	171,4	86,3
Total Income	**(445,0)**	**2 592,0**	**4 966,0**	**4 693,0**	**4 391,0**

BMW - Adjustments	**FY 2009**	**FY 2010**	**FY 2011**	**FY 2012**	**FY 2013**
Depreciation and amortization	3 603,0	3 861,0	3 654,0	3 716,0	3 830,0
Research and development	2 587,0	3 082,0	3 610,0	3 993,0	4 117,0

Bayerische Motoren Werke AG
Analytical Balance Sheet

EUR million					
BMW - Balance Sheet	**FY 2009**	**FY 2010**	**FY 2011**	**FY 2012**	**FY 2013**
Operational Assets					
Intangible assets	5 230,0	4 892,0	4 682,0	4 648,0	5 646,0
Property, plant and equipment	11 181,0	11 216,0	11 444,0	13 053,0	14 808,0
Leased products	187,0	182,0	151,0	128,0	19,0
Investments accounted for using the egquity method	114,0	189,0	281,0	514,0	652,0
Deferred tax	1 514,0	1 888,0	2 276,0	2 217,0	2 226,0
Other assets	2 114,0	2 473,0	3 139,0	3 862,0	2 797,0
Inventories	6 289,0	7 468,0	9 309,0	9 366,0	9 259,0
Trade receivables	1 608,0	1 983,0	3 014,0	2 305,0	2 184,0
Current tax	789,0	1 068,0	1 065,0	775,0	1 002,0
Other assets	14 863,0	15 871,0	15 333,0	16 162,0	15 480,0
Operational Liabilities					
Other provisions	2 295,0	2 348,0	2 840,0	3 103,0	3 075,0
Deferred tax	1 694,0	1 726,0	893,0	492,0	1 072,0
Other liabilities	3 401,0	2 873,0	3 289,0	3 394,0	3 584,0
Other provisions	1 759,0	2 336,0	2 519,0	2 605,0	3 039,0
Current tax	650,0	1 026,0	1 188,0	1 269,0	1 021,0
Trade payables	2 556,0	3 713,0	4 719,0	5 669,0	6 764,0
Other liabilities	11 936,0	18 162,0	17 934,0	18 652,0	19 025,0
Total Operational Liabilities	**24 291,0**	**32 184,0**	**33 382,0**	**35 184,0**	**37 580,0**
Invested Capital	**19 598,0**	**15 046,0**	**17 312,0**	**17 846,0**	**16 493,0**
NIBD					
Financial Liabilities					
Pension provisions	1 652,0	349,0	811,0	2 358,0	938,0
Finanical liabilities	259,0	1 164,0	1 822,0	1 775,0	1 604,0
Financial liabilities	4 736,0	961,0	1 468,0	1 289,0	725,0
Financial Assets					
Other investments	2 678,0	3 263,0	4 520,0	4 789,0	5 253,0
Financial assets	475,0	662,0	287,0	759,0	1 183,0
Financial assets	1 666,0	1 911,0	2 307,0	2 746,0	4 479,0
Cash and cash equivalents	4 331,0	5 585,0	5 829,0	7 484,0	6 768,0
Net Interest Bearing Debt	**(2 503,0)**	**(8 947,0)**	**(8 842,0)**	**(10 356,0)**	**(14 416,0)**
Equity	**22 101,0**	**23 993,0**	**26 154,0**	**28 202,0**	**30 909,0**
Invested Capital (NIBD + E)	**19 598,0**	**15 046,0**	**17 312,0**	**17 846,0**	**16 493,0**

Audi AG
Analytical Income Statement

EUR million

Audi AG - Income Statement	**FY 2009**	**FY 2010**	**FY 2011**	**FY 2012**	**FY 2013**
Net Sales	**29 840,0**	**35 441,0**	**44 096,0**	**48 771,0**	**49 880,0**
Cost of Sales	(25 649,0)	(29 706,0)	(36 000,0)	(39 061,0)	(40 691,0)
Depreciation and amortization	1 775,0	2 170,0	1 793,0	1 934,0	2 070,0
Research and development	2 050,0	2 469,0	2 641,0	2 942,0	3 287,0
Gross profit, adjusted	**8 016,0**	**10 374,0**	**12 530,0**	**14 586,0**	**14 546,0**
Distribution costs	(3 138,0)	(3 038,0)	(3 599,0)	(4 594,0)	(4 641,0)
Administrative expenses	(301,0)	(374,0)	(429,0)	(527,0)	(566,0)
Other operating income	1475	1684	1967	1881	1952
Other operating expense	-622	-667	-687	-1106	-903
Result from investments	110	220	270	415	454
Research and development	(2 050,0)	(2 469,0)	(2 641,0)	(2 942,0)	(3 287,0)
EBITDA	**3 490,0**	**5 730,0**	**7 411,0**	**7 713,0**	**7 555,0**
Depreciation and amortization	(1 775,0)	(2 170,0)	(1 793,0)	(1 934,0)	(2 070,0)
EBIT	**1 715,0**	**3 560,0**	**5 618,0**	**5 779,0**	**5 485,0**
Financial expenses	(269,0)	(294,0)	(264,0)	(403,0)	(158,0)
Financial income	483,0	368,0	687,0	574,0	(4,0)
Net financial expenses					
EBT	**1 929,0**	**3 634,0**	**6 041,0**	**5 950,0**	**5 323,0**
Income tax expense (benefit)	(581,0)	(1 004,0)	(1 601,0)	(1 602,0)	(1 309,0)
Effective tax rate	30,1%	27,6%	26,5%	26,9%	24,6%
Tax on EBIT	(516,5)	(983,6)	(1 488,9)	(1 556,0)	(1 348,8)
NOPAT	**1 198,5**	**2 576,4**	**4 129,1**	**4 223,0**	**4 136,2**
Net financial expenses	214,0	74,0	423,0	171,0	(162,0)
Tax shield	(64,5)	(20,4)	(112,1)	(46,0)	39,8
Net Income before minority interest	**1 348,0**	**2 630,0**	**4 440,0**	**4 348,0**	**4 014,0**
(Income) loss attributable to minority interests	(48,0)	(45,0)	(51,0)	(69,0)	(53,0)
Net Income	**1 300,0**	**2 585,0**	**4 389,0**	**4 279,0**	**3 961,0**
Total Income	**1 300,0**	**2 585,0**	**4 389,0**	**4 279,0**	**3 961,0**

Audi AG - Adjustments	**FY 2009**	**FY 2010**	**FY 2011**	**FY 2012**	**FY 2013**
Depreciation and amortization	1 775,0	2 170,0	1 793,0	1 934,0	2 070,0
Research and development	2 050,0	2 469,0	2 641,0	2 942,0	3 287,0

Audi AG
Analytical Balance Sheet

EUR million

Audi AG - Balance Sheet	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
Operational Assets					
Intangible assets	2 171,0	2 357,0	2 531,0	4 038,0	4 689,0
Property, plant and equipment	5 795,0	5 803,0	6 716,0	7 605,0	8 413,0
Leasing and rental assets	0,0	0,0	5,0	2,0	0,0
Investments accounted for using equity method	212,0	326,0	460,0	3 638,0	3 678,0
Deferred tax assets	919,0	1 347,0	1 839,0	1 713,0	1 720,0
Other receivables	46,0	37,0	21,0	13,0	12,0
Inventories	2 568,0	3 354,0	4 377,0	4 331,0	4 495,0
Trade receivables	2 281,0	2 099,0	3 009,0	2 251,0	3 176,0
Effective income tax assets	23,0	13,0	11,0	43,0	35,0
Other receivables	368,0	408,0	273,0	451,0	479,0
Cash funds	6 455,0	10 724,0	8 513,0	11 170,0	13 332,0
Operational Liabilities					
Deferred tax liabilities	45,0	22,0	16,0	208,0	517,0
Other liabilities	348,0	483,0	511,0	711,0	843,0
Effective income tax obligations, non-current	773,0	636,0	754,0	913,0	979,0
Other provisions	2 979,0	3 768,0	4 234,0	4 177,0	4 265,0
Effective income tax obligations, current	405,0	857,0	929,0	346,0	225,0
Trade payables	3 114,0	3 510,0	4 193,0	4 270,0	5 163,0
Other liabilities	2 775,0	4 156,0	2 082,0	2 368,0	2 664,0
Other provisions	2 502,0	2 354,0	2 858,0	2 803,0	3 360,0
Total Operational Liabilities	**12 941,0**	**15 786,0**	**15 577,0**	**15 796,0**	**18 016,0**
Invested Capital	**7 897,0**	**10 682,0**	**12 178,0**	**19 459,0**	**22 013,0**
Invested Capital (NIBD + E)					
NIBD					
Financial Liabilities					
Financial liabilities	2,0	15,0	21,0	145,0	186,0
Other financial liabilities	179,0	229,0	569,0	244,0	196,0
Provision for pensions	2 098,0	2 331,0	2 505,0	3 470,0	3 209,0
Financial liabilities	577,0	810,0	1 172,0	1 168,0	1 228,0
Other financial liabilities	120,0	291,0	4 273,0	4 485,0	3 759,0
Financial Assets					
Investment property	12,0	12,0	3,0	118,0	171,0
Other Long-term investments	107,0	180,0	244,0	254,0	290,0
Other financial assets	389,0	523,0	391,0	662,0	969,0
Securities	821,0	1 339,0	1 594,0	1 807,0	2 400,0
Other finanical assets	4 396,0	2 250,0	7 033,0	2 303,0	1 296,0
Net Interest Bearing Debt	**(2 749,0)**	**(628,0)**	**(725,0)**	**4 368,0**	**3 452,0**
Equity	**10 646,0**	**11 310,0**	**12 903,0**	**15 091,0**	**18 561,0**
Invested Capital (NIBD + E)	**7 897,0**	**10 682,0**	**12 178,0**	**19 459,0**	**22 013,0**

Toyota Motors
Analytical Income Statement

JPY million

Toyota Motors - Income Statement	**FY 2009**	**FY 2010**	**FY 2011**	**FY 2012**	**FY 2013**
Net Sales	**19 182 161,0**	**17 732 143,0**	**17 826 986,0**	**17 534 872,0**	**20 943 634,0**
Cost of Sales	(17 470 791)	(15 973 442)	(15 986 741)	(15 796 635)	(18 034 256)
Depreciation and amortization	1 105 233,0	1 065 749,0	844 708,0	769 073,0	768 581,0
Research and development	904 075,0	725 345,0	730 340,0	779 806,0	807 454,0
Gross profit, adjusted	**3 720 678,0**	**3 549 795,0**	**3 415 293,0**	**3 287 116,0**	**4 485 413,0**
Selling, General and Administrative	(2 097 674,0)	(1 854 710,0)	(1 723 071,0)	(1 676 999,0)	(1 899 997,0)
Research and development	(904 075,0)	(725 345,0)	(730 340,0)	(779 806,0)	(807 454,0)
Equity in net income/loss of affiliated companies	53 226,0	109 944,0	214 229,0	196 544,0	230 078,0
EBITDA	**772 155,0**	**1 079 684,0**	**1 176 111,0**	**1 026 855,0**	**2 008 040,0**
Depreciation and amortization	(1 105 233,0)	(1 065 749,0)	(844 708,0)	(769 073,0)	(768 581,0)
EBIT	**(333 078,0)**	**13 935,0**	**331 403,0**	**257 782,0**	**1 239 459,0**
Interest income	(71 925,0)	178 034,0	118 158,0	92 857,0	102 804,0
Interest expense	0,0	(33 409,0)	(29 318,0)	(22 922,0)	(22 967,0)
Net financial expenses					
EBT	**(405 003,0)**	**158 560,0**	**420 243,0**	**327 717,0**	**1 319 296,0**
Income tax	10 152,0	(42 342,0)	(178 795,0)	(141 558,0)	(436 223,0)
Effective tax rate	2,2%	87,1%	86,8%	107,9%	40,0%
Tax on EBIT	8 558,5	83 618,8	(101 692,7)	(66 086,2)	(404 248,9)
NOPAT	**(324 519,5)**	**97 553,8**	**229 710,3**	**191 695,8**	**835 210,1**
Net financial expenses	(71 925,0)	144 625,0	88 840,0	69 935,0	79 837,0
Tax shield	1 593,5	(125 960,8)	(77 102,3)	(75 471,8)	(31 974,1)
Net Income before minority interest	**(394 851,0)**	**116 218,0**	**241 448,0**	**186 159,0**	**883 073,0**
Minority interests	26 282,0	(32 103,0)	(54 055,0)	(82 181,0)	(119 359,0)
Net Income	**(368 569,0)**	**84 115,0**	**187 393,0**	**103 978,0**	**763 714,0**
Total non-recurring items					
Tax shield on non-recurring items					
Total Income	**(368 569,0)**	**84 115,0**	**187 393,0**	**103 978,0**	**763 714,0**

Toyota Motors - Adjustments	**FY 2009**	**FY 2010**	**FY 2011**	**FY 2012**	**FY 2013**
Depreciation and amortization	1 105 233,0	1 065 749,0	844 708,0	769 073,0	768 581,0
Research and development	904 075,0	725 345,0	730 340,0	779 806,0	807 454,0

Toyota Motors
Analytical Balance Sheet

JPY million					
Toyota Motors - Balance Sheet	**FY 2009**	**FY 2010**	**FY 2011**	**FY 2012**	**FY 2013**
Operational Assets					
Investments and other assets	4 254 126,0	4 549 658,0	5 825 966,0	6 218 377,0	7 462 767,0
Property, plant and equipment	5 504 559,0	4 996 321,0	4 608 309,0	4 510 716,0	4 741 357,0
Trade accounts and notes receivable	1 404 292,0	1 908 884,0	1 483 551,0	2 031 472,0	2 033 831,0
Inventories	1 459 394,0	1 422 373,0	1 304 128,0	1 622 154,0	1 715 634,0
Prepaid expenses and other current assets	1 534 119,0	1 793 622,0	1 383 616,0	1 464 124,0	1 597 514,0
Operational Liabilities					
Other long-term liabilities	444 529,0	604 903,0	554 402,0	531 982,0	969 668,0
Accounts payable	1 299 523,0	1 954 147,0	1 497 253,0	2 234 316,0	2 092 722,0
Accrued expenses	1 432 988,0	1 627 228,0	1 666 748,0	1 737 490,0	2 092 102,0
Income taxes payable	47 648,0	140 210,0	104 392,0	123 344,0	140 935,0
Other current liabilities	944 303,0	931 727,0	1 024 662,0	1 175 801,0	1 186 870,0
Total Operational Liabilities	**4 168 991,0**	**5 258 215,0**	**4 847 457,0**	**5 802 933,0**	**6 482 297,0**
Invested Capital	**9 987 499,0**	**9 412 643,0**	**9 758 113,0**	**10 043 910,0**	**11 068 806,0**
Invested Capital (NIBD + E)					
NIBD					
Financial Liabilities					
Long-term debt	850 233,0	1 095 270,0	839 611,0	503 070,0	521 428,0
Accrued pension and severance cost	629 870,0	672 905,0	660 918,0	700 211,0	754 360,0
Short-term borrowing	825 029,0	575 890,0	478 646,0	715 019,0	576 685,0
Current portion of long-term debt	115 942,0	289 447,0	243 817,0	339 441,0	185 582,0
Financial Assets					
Cash and cash equivalents	1 648 143,0	1 338 821,0	1 300 553,0	1 104 636,0	1 107 409,0
Marketable securities	494 476,0	1 783 629,0	1 036 555,0	1 015 626,0	1 204 447,0
Net Interest Bearing Debt	**278 455,0**	**(488 938,0)**	**(114 116,0)**	**137 479,0**	**(273 801,0)**
Equity	**9 709 044,0**	**9 901 581,0**	**9 872 229,0**	**9 906 431,0**	**11 342 607,0**
Invested Capital (NIBD + E)	**9 987 499,0**	**9 412 643,0**	**9 758 113,0**	**10 043 910,0**	**11 068 806,0**

General Motors
Analytical Income Statement

USD 100,000

General Motors - Income Statement	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
Net Sales	**105 147,0**	**136 749,0**	**152 058,0**	**151 857,0**	**153 902,0**
Cost of Sales	(112 130,0)	(118 768,0)	(130 386,0)	(140 236,0)	(134 925,0)
Depreciation and amortization	11 114,0	6 923,0	6 058,0	11 402,0	7 012,0
Research and development	6 051,0	6 962,0	8 100,0	7 400,0	7 200,0
Gross profit, adjusted	**10 182,0**	**31 866,0**	**35 830,0**	**30 423,0**	**33 189,0**
Selling, General and Administrative Expenses	(12 167,0)	(11 446,0)	(12 163,0)	(14 031,0)	(12 382,0)
Research and development	(6 051,0)	(6 962,0)	(8 100,0)	(7 400,0)	(7 200,0)
EBITDA	**(8 036,0)**	**13 458,0**	**15 567,0**	**8 992,0**	**13 607,0**
Depreciation and amortization	(11 114,0)	(6 923,0)	(6 058,0)	(11 402,0)	(7 012,0)
EBIT	**(19 150,0)**	**6 535,0**	**9 509,0**	**(2 410,0)**	**6 595,0**
Interest income	367,0	465,0	455,0	343,0	249,0
Interest expense	(6 122,0)	(1 098,0)	(540,0)	(489,0)	(334,0)
Net financial expenses					
EBT	**(24 905,0)**	**5 902,0**	**9 424,0**	**(2 556,0)**	**6 510,0**
Income tax expense (benefit)	2 166,0	(672,0)	(295,0)	34 654,0	(1 827,0)
Effective tax rate	8,8%	12,2%	5,5%	112,7%	36,7%
Tax on EBIT	1 735,1	(619,4)	(348,8)	4 474,7	(1 757,9)
NOPAT	**(17 414,9)**	**5 915,6**	**9 160,2**	**2 064,7**	**4 837,1**
Net financial expenses	(5 755,0)	(633,0)	(85,0)	(146,0)	(85,0)
Tax shield	506,7	76,9	4,7	164,5	31,2
Net Income before minority interest	**(22 663,3)**	**5 359,5**	**9 079,9**	**2 083,2**	**4 783,3**
(Income) loss attributable to minority interests	(396,0)	(331,0)	(97,0)	52,0	15,0
Net Income	**(23 059,3)**	**5 028,5**	**8 982,9**	**2 135,2**	**4 798,3**
Goodwill impairment charges	0,0	0,0	(1 286,0)	(27 145,0)	(541,0)
Other non-operating income	860,0	1 066,0	396,0	502,0	814,0
Total non-recurring items	860,0	1 066,0	(890,0)	(26 643,0)	273,0
Tax shield on non-recurring items	(75,7)	(129,5)	49,1	30 014,8	(100,3)
Total Income	**(22 275,0)**	**5 965,0**	**8 142,0**	**5 507,0**	**4 971,0**

General Motors - Adjustments	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
Depreciation and amortization	11 114,0	6 923,0	6 058,0	11 402,0	7 012,0
Research and development	6 051,0	6 962,0	8 100,0	7 400,0	7 200,0

General Motors
Analytical Balance Sheet

USD 100,000

General Motors - Balance Sheet	**FY 2009**	**FY 2010**	**FY 2011**	**FY 2012**	**FY 2013**
Operational Assets					
Equity in net assets on nonconsolidated affiliates	7 936,0	8 529,0	6 790,0	6 883,0	8 094,0
Property, net	18 687,0	19 235,0	23 005,0	24 196,0	25 867,0
Intangible assets, net	14 547,0	11 882,0	10 014,0	6 809,0	5 668,0
Other assets	2 623,0	3 286,0	2 416,0	2 358,0	2 352,0,
Deferred income taxes	564,0	308,0	512,0	27 922,0	22 736,0
Accounts and notes receivable	7 518,0	8 699,0	9 964,0	10 395,0	8 535,0
Inventories	10 107,0	12 125,0	14 324,0	14 714,0	14 039,0
Equipment on operating leases, net	2 727,0	2 568,0	2 464,0	1 782,0	2 398,0
Other current assets and deferred income taxes	1 777,0	1 805,0	1 169,0	1 536,0	1 662,0
Deferred income taxes	0,0	0,0	527,0	9 429,0	10 349,0
Operational Liabilities					
Other liabilities an deferred income taxes	13 279,0	13 021,0	12 442,0	13 169,0	13 353,0
Accounts payable	18 725,0	21 497,0	24 551,0	25 166,0	23 621,0
Accrued liabilities	22 288,0	24 044,0	22 875,0	23 308,0	24 633,0
Total Operational Liabilities	**54 292,0**	**58 562,0**	**59 868,0**	**61 643,0**	**61 607,0**
Invested Capital excluding Goodwill	**12 194,0**	**9 875,0**	**11 317,0**	**44 381,0**	**40 093,0**
Goodwill	30 672,0	30 513,0	29 019,0	1 973,0	1 560,0
Invested Capital	**42 866,0**	**40 388,0**	**40 336,0**	**46 354,0**	**41 653,0**
NIBD					
Financial Liabilities					
Long-term debt	5 562,0	3 014,0	3 613,0	3 424,0	6 573,0
Postretirement benefits and other pensions	9 554,0	9 294,0	6 836,0	7 309,0	5 897,0
Pensions	27 086,0	21 894,0	25 075,0	27 420,0	19 483,0
Liabilities held for sale	625,0	0,0	0,0	0,0	0,0
Short-term debt and current portion of long-term debt	10 221,0	1 616,0	1 682,0	1 748,0	564,0
Financial Assets					
Assets held for sale	918,0	0,0	0,0	0,0	0,0
Cash and cash equivalents	22 679,0	21 061,0	16 071,0	18 422,0	20 021,0
Marketable securities	134,0	5 555,0	16 148,0	8 988,0	8 972,0
Restricted cash and marketable securities	15 406,0	2 400,0	2 233,0	1 368,0	2 076,0
Net Interest Bearing Debt	**13 911,0**	**6 802,0**	**2 754,0**	**11 123,0**	**1 448,0**
Equity	**28 955,0**	**33 586,0**	**37 582,0**	**35 231,0**	**40 205,0**
Invested Capital (NIBD + E)	**42 866,0**	**40 388,0**	**40 336,0**	**46 354,0**	**41 653,0**

Ford Motors
Analytical Income Statement

USD 100,000

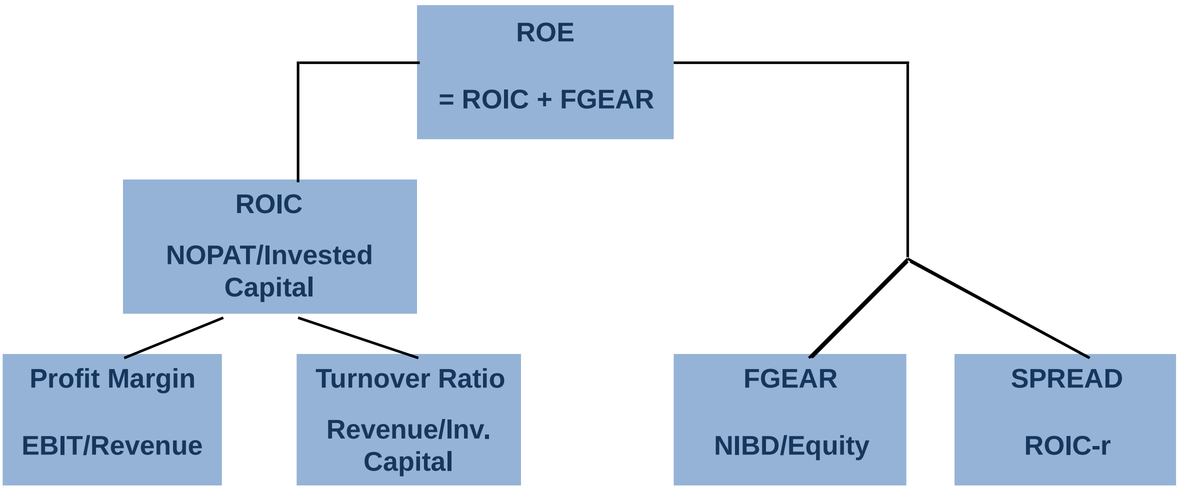
Ford Motors - Income Statement	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
Net Sales	**103 868,0**	**119 280,0**	**128 168,0**	**126 567,0**	**139 369,0**
Cost of Sales	(98 866,0)	(104 451,0)	(113 345,0)	(112 578,0)	(125 234,0)
Depreciation and amortization	3 876,0	3 873,0	3 533,0	3 655,0	4 075,0
Research and development	4 700,0	5 000,0	5 300,0	5 500,0	6 400,0
Gross profit, adjusted	**13 578,0**	**23 702,0**	**23 656,0**	**23 144,0**	**24 610,0**
Selling, General and Administrative Expenses	(8 354,0)	(9 040,0)	(9 060,0)	(9 006,0)	(9 997,0)
Research and development	(4 700,0)	(5 000,0)	(5 300,0)	(5 500,0)	(6 400,0)
Equity in net income/loss of affiliated companies	330,0	526,0	479,0	555,0	1 046,0
EBITDA	**854,0**	**10 188,0**	**9 775,0**	**9 193,0**	**9 259,0**
Depreciation and amortization	(3 876,0)	(3 873,0)	(3 533,0)	(3 655,0)	(4 075,0)
EBIT	**(3 022,0)**	**6 315,0**	**6 242,0**	**5 538,0**	**5 184,0**
Interest income	205,0	262,0	387,0	272,0	163,0
Interest expense	(1 477,0)	(1 807,0)	(817,0)	(713,0)	(829,0)
Net financial expenses					
EBT	**(4 294,0)**	**4 770,0**	**5 812,0**	**5 097,0**	**4 518,0**
Income tax	113,0	(592,0)	11 541,0	(2 056,0)	147,0
Effective tax rate	-24,8%	16,4%	-191,2%	35,0%	-3,4%
Tax on EBIT	(832,5)	(946,7)	11 017,2	(1 745,6)	142,0
NOPAT	**(3 854,5)**	**5 368,3**	**17 259,2**	**3 792,4**	**5 326,0**
Net financial expenses	(1 272,0)	(1 545,0)	(430,0)	(441,0)	(666,0)
Tax shield	(315,9)	252,7	(822,0)	154,5	(22,9)
Net Income before minority interest	**(5 442,4)**	**4 076,0**	**16 007,2**	**3 505,9**	**4 637,2**
Minority interests	0,0	4,0	(9,0)	(1,0)	(7,0)
Net Income	**(5 442,4)**	**4 080,0**	**15 998,2**	**3 504,9**	**4 630,2**
Other non-operating income	5 079,0	(624,0)	704,0	1 327,0	811,0
Total non-recurring items	5 079,0	(624,0)	704,0	1 327,0	811,0
Tax shield on non-recurring items	1 261,4	102,0	1 345,8	(464,9)	27,8
Total Income	**898,0**	**3 558,0**	**18 048,0**	**4 367,0**	**5 469,0**

Ford Motors - Adjustments	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
Depreciation and amortization	3 876,0	3 873,0	3 533,0	3 655,0	4 075,0
Research and development	4 700,0	5 000,0	5 300,0	5 500,0	6 400,0

Ford Motors
Analytical Balance Sheet

USD 100,000					
Ford Motors - Balance Sheet	**FY 2009**	**FY 2010**	**FY 2011**	**FY 2012**	**FY 2013**
Operational Assets					
Equity in net assets of affiliated companies	2 246,0	2 441,0	2 797,0	3 112,0	3 546,0
Net property	22 455,0	23 027,0	22 229,0	24 813,0	27 492,0
Deferred income taxes	5 660,0	2 468,0	13 932,0	13 325,0	13 283,0
Net intangible assets	165,0	102,0	100,0	0,0	0,0
Other assets	1 681,0	2 019,0	1 549,0	2 033,0	2 824,0
Non-current receivables from Financial Services	0,0	181,0	32,0	0,0	724,0
Receivables, less allowance	3 378,0	3 992,0	4 219,0	5 361,0	5 641,0
Inventories	5 041,0	5 917,0	5 901,0	7 362,0	7 708,0
Deferred income taxes	479,0	359,0	1 791,0	3 488,0	1 574,0
Net investment in operating leases	2 208,0	1 282,0	1 356,0	1 415,0	1 384,0
Other current assets	688,0	610,0	1 053,0	1 124,0	1 034,0
Current receivables from Financial Services	2 568,0	1 700,0	878,0	0,0	0,0
Operational Liabilities					
Deferred income taxes	561,0	344,0	255,0	514,0	430,0
Payables	11 607,0	13 466,0	14 015,0	18 151,0	18 035,0
Other payables	1 458,0	1 544,0	2 734,0	0,0	0,0
Deferred income taxes	3 091,0	392,0	40,0	81,0	267,0
Current payables to Financial Services	1 638,0	2 049,0	1 033,0	252,0	907,0
Total Operational Liabilities	**18 355,0**	**17 795,0**	**18 077,0**	**18 998,0**	**19 639,0**
Invested Capital	**28 214,0**	**26 303,0**	**37 760,0**	**43 035,0**	**45 571,0**
Invested Capital (NIBD + E)					
NIBD					
Financial Liabilities					
Long-term debt	31 972,0	17 028,0	12 061,0	12 870,0	14 426,0
Other liabilities and deferred revenue	23 132,0	23 016,0	26 910,0	30 549,0	21 665,0
Liabilities of held for sale operations	5 321,0	0,0	0,0	0,0	0,0
Other liabilities and deferred revenue	18 138,0	17 065,0	15 003,0	15 358,0	16 537,0
Debt payable within one yeat	0,0	0,0	0,0	1 386,0	1 257,0
Financial Assets					
Assets of held for sale operations	7 618,0	0,0	0,0	0,0	0,0
Cash and cash equivalents	9 762,0	6 301,0	7 965,0	6 247,0	4 959,0
Marketable securities	15 169,0	14 207,0	14 984,0	18 178,0	20 157,0
Net Interest Bearing Debt	**46 014,0**	**36 601,0**	**31 025,0**	**35 738,0**	**28 769,0**
Equity	**(17 800,0)**	**(10 298,0)**	**6 735,0**	**7 297,0**	**16 802,0**
Invested Capital (NIBD + E)	**28 214,0**	**26 303,0**	**37 760,0**	**43 035,0**	**45 571,0**

Appendix 4.3: Financial ratios for Tesla and peers and DuPont structure and formulas
Source: Compiled by author / Petersen & Plenborg (2012) / Company Reports



$$Return\ of\ Equity, ROE = ROIC + FGEAR$$

$$Return\ on\ Invested\ Capital, ROIC = \frac{NOPAT}{Average\ Invested\ Capital}$$

$$FGEAR = \frac{NIBD}{Equity}$$

$$Net\ borrowing\ costs, NBC = \frac{Net\ financial\ expeses}{Average\ NIBD}$$

$$Profit\ Margin = \frac{EBIT}{Revenue}$$

$$Turnover\ rate = \frac{Revenue}{Invested\ Capital}$$

DuPont Ratios

Tesla Motors - Ratios	FY 2010	FY 2011	FY 2012	FY 2013
Ratios, before tax				
ROIC	-260%	-156%	-134%	-11%
Profit Margin (EBIT-margin)	-126%	-123%	-95%	-3%
Profit Margin (EBITDA-margin)	-117%	-115%	-88%	2%
Turnover of Invested Capital	2,06	1,27	1,41	3,75
Turnover of Invested Capital, days	177	288	260	97
Net borrowing cost	-0,9%	0,4%	0,0%	23%
Spread	-259%	-157%	-134%	-35%
Leverage	-0,59	-0,25	0,68	0,35
ROE	-108%	-117%	-226%	-24%
ROIC (NOPAT)	-260%	-157%	-134%	-12%

BMW - Ratios	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
Ratios, before tax					
ROIC		26%	47%	45%	41%
Profit Margin (EBIT-margin)		8%	12%	11%	10%
Profit Margin (EBITDA-margin)		15%	18%	17%	15%
Turnover of Invested Capital		3,13	3,91	3,99	4,11
Turnover of Invested Capital, days		117	93	91	89
Net borrowing cost		-5,5%	-2,3%	-2,1%	-1,9%
Spread		31%	50%	47%	43%
Leverage		-0,25	-0,35	-0,35	-0,42
ROE		18%	30%	28%	23%
ROIC (NOPAT)		17%	35%	30%	28%

Audi AG - Ratios	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
Ratios, before tax					
ROIC		38%	49%	36%	27%
Profit Margin (EBIT-margin)		10%	13%	12%	11%
Profit Margin (EBITDA-margin)		16%	17%	16%	15%
Turnover of Invested Capital		3,82	3,86	3,08	2,41
Turnover of Invested Capital, days		96	95	118	152
Net borrowing cost		4,4%	63%	-9%	4%
Spread		34%	-13%	46%	22%
Leverage		-0,15	-0,06	0,13	0,23
ROE		33%	50%	43%	32%
ROIC (NOPAT)		28%	36%	27%	20%

Toyota Motors - Ratios	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
Ratios, before tax					
ROIC		0,1%	4%	3%	12%
Profit Margin (EBIT-margin)		0,1%	2%	2%	6%
Profit Margin (EBITDA-margin)		6%	7%	6%	10%
Turnover of Invested Capital		1,83	1,86	1,77	1,98
Turnover of Invested Capital, days		200	196	206	184
Net borrowing cost		137%	30%	-599%	117%
Spread		-137%	-26%	601%	-105%
Leverage		-0,01	-0,03	0,00	-0,01
ROE		2%	4%	3%	12%
ROIC (NOPAT)		1%	2%	2%	8%

Ford Motors - Ratios	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
Ratios, before tax					
ROIC		23%	20%	14%	11,7%
Profit Margin (EBIT-margin)		5%	5%	4%	3,7%
Profit Margin (EBITDA-margin)		9%	8%	7%	6,6%
Turnover of Invested Capital		4,38	4,00	3,13	3,15
Turnover of Invested Capital, days		83	91	117	116,0
Net borrowing cost		4%	1%	1%	2,1%
Spread		19%	18%	12%	9,6%
Leverage		-2,94	-18,98	4,76	2,68
ROE		-34%	-326%	73%	38%
ROIC (NOPAT)		20%	54%	9%	12%

General Motors - Ratios	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
Ratios, before tax					
ROIC		16%	24%	-6%	15%
Profit Margin (EBIT-margin)		5%	6%	-2%	4%
Profit Margin (EBITDA-margin)		20%	10%	6%	9%
Turnover of Invested Capital		3,29	34,0	3,50	3,50
Turnover of Invested Capital, days		111	97	104	104
Net borrowing cost		6%	2%	2,%	1%
Spread		10%	22%	-8%	14%
Leverage		0,33	0,13	0,19	0,17
ROE		19%	27%	-7%	17%
ROIC (NOPAT)		14%	23%	5%	11%

Common-Size Analysis of Income Statement

Tesla, Common-size of Income Statement	FY 2010	FY 2011	FY 2012	FY 2013	Q1 2014
Revenue	**100 %**	**100 %**	**100 %**	**100 %**	**100 %**
Automotive sales	83 %	73 %	93 %	99 %	99,7 %
Vehicle Sales	*62 %*	*48 %*	*76 %*	*87 %*	*95 %*
Emission credits	*2 %*	*1 %*	*10 %*	*10 %*	*2 %*
Sale of powertrain components	*19 %*	*23 %*	*8 %*	*2 %*	*3 %*
Depreciation	-14 %	-13 %	-8 %	-7 %	-11 %
Gross profit, adjusted	**35 %**	**38 %**	**14 %**	**28 %**	**32 %**
R&D	-80 %	-102 %	-66 %	-12 %	-13 %
SG&A	-72 %	-51 %	-36 %	-14 %	-19 %
EBITDA	**-117 %**	**-115 %**	**-88 %**	**2 %**	**0 %**
Depreciation	-9 %	-8 %	-7 %	-5 %	-7 %
EBIT	**-126 %**	**-123 %**	**-95 %**	**-3 %**	**-7 %**
Tax on EBIT	0 %	0 %	0 %	-4 %	-2 %
NOPAT	**-126 %**	**-123 %**	**-95 %**	**-3 %**	**-7 %**

BMW, Common-size of Income Statement	FY 2010	FY 2011	FY 2012	FY 2013
Revenue	**100 %**	**100 %**	**100 %**	**100 %**
Cost of revenues	-70 %	-68 %	-70 %	-71 %
Gross profit	**30 %**	**32 %**	**30 %**	**29 %**
R&D	-6 %	-6 %	-6 %	-6 %
SG&A	-9 %	-8 %	-8 %	-9 %
EBITDA	**15 %**	**18 %**	**17 %**	**15 %**
Depreciation and amortization	-7 %	-6 %	-5 %	-5 %
EBIT	**8 %**	**12 %**	**11 %**	**10 %**
NOPAT	**6 %**	**9 %**	**7 %**	**7 %**

Audi, Common-size of Income Statement	FY 2010	FY 2011	FY 2012	FY 2013
Revenue	**100 %**	**100 %**	**100 %**	**100 %**
Cost of revenues	-71 %	-72 %	-70 %	-71 %
Gross profit	**29 %**	**28 %**	**30 %**	**29 %**
R&D	-1 %	-1 %	-1 %	-1 %
SG&A	-10 %	-9 %	-11 %	-10 %
EBITDA	**16 %**	**17 %**	**16 %**	**15 %**
Depreciation and amortization	-6 %	-4 %	-4 %	-4 %
EBIT	**10 %**	**13 %**	**12 %**	**11 %**
NOPAT	**7 %**	**9 %**	**9 %**	**8 %**

Toyota, Common-size of Income Statement	FY 2010	FY 2011	FY 2012	FY 2013
Revenue	**100 %**	**100 %**	**100 %**	**100 %**
Cost of revenues	-80 %	-81 %	-81 %	-79 %
Gross profit	**20 %**	**19 %**	**19 %**	**21 %**
R&D	-4 %	-4 %	-4 %	-4 %
SG&A	-10 %	-10 %	-10 %	-9 %
EBITDA	**6 %**	**7 %**	**6 %**	**10 %**
Depreciation and amortization	-6 %	-5 %	-4 %	-4 %
EBIT	**0 %**	**2 %**	**1 %**	**6 %**
NOPAT	**1 %**	**1 %**	**1 %**	**4 %**

Ford, Common-size of Income Statement	FY 2010	FY 2011	FY 2012	FY 2013
Revenue	**100 %**	**100 %**	**100 %**	**100 %**
Cost of revenues	-80 %	-82 %	-82 %	-82 %
Gross profit	**20 %**	**18 %**	**18 %**	**18 %**
R&D	-4 %	-4 %	-4 %	-5 %
SG&A	-8 %	-7 %	-7 %	-7 %
EBITDA	**9 %**	**8 %**	**7 %**	**7 %**
Depreciation and amortization	-3 %	-3 %	-3 %	-3 %
EBIT	**5 %**	**5 %**	**4 %**	**4 %**
NOPAT	**5 %**	**13 %**	**3 %**	**4 %**

GM, Common-size of Income Statement	FY 2010	FY 2011	FY 2012	FY 2013
Revenue	**100 %**	**100 %**	**100 %**	**100 %**
Cost of revenues	-77 %	-76 %	-80 %	-78 %
Gross profit	**23 %**	**24 %**	**20 %**	**22 %**
R&D	-5 %	-5 %	-5 %	-5 %
SG&A	-8 %	-8 %	-9 %	-8 %
EBITDA	**10 %**	**10 %**	**6 %**	**9 %**
Depreciation and amortization	-5 %	-4 %	-8 %	-5 %
EBIT	**5 %**	**6 %**	**-2 %**	**4 %**
NOPAT	**4 %**	**6 %**	**1 %**	**3 %**

Tesla: Indexing and Day´s Turnover of Invested Capital, Liquidity Ratios

Tesla, Indexing of Invested Capital	**FY 2010**	**FY 2011**	**FY 2012**	**FY 2013**
Operational Assets				
Property, plant and equipment	100,0	298,9	615,6	934,1
Other assets	100,0	177,0	174,0	179,0
Operating lease vehicles, net	100,0	247,6	274,1	4 929,0
Inventory	100,0	139,3	465,7	890,1
Accounts receivable	100,0	159,3	356,7	744,8
Prepaid expenses and other current assets	100,0	134,5	118,5	239,1
Total Operational Assets	**100,0**	**229,8**	**486,1**	**923,4**
Operational Liabilities				
Resale value guarantee			833,7	1 418,6
Other long-term liabilities	100,0	172,8	254,8	529,9
Accounts payable	100,0	193,2	816,4	1 379,2
Accrued liabilities	100,0	149,5	202,7	417,3
Deferred development compensation	100,0	0,0	0,0	0,0
Reservation payments	100,0	54,1	0,0	0,0
Customer deposits		100,0	251,3	329,1
Total Operational Liabilities	**100,0**	**189,1**	**461,3**	**904,7**
Invested Capital	**100,0**	**284,6**	**519,6**	**948,6**

Tesla, Days Turnover of Invested Capital	**FY 2010**	**FY 2011**	**FY 2012**	**FY 2013**
Operational Assets				
Property, plant and equipment	1,7	1,0	1,0	3,1
Other assets	9,2	9,1	18,6	88,3
Operating lease vehicles, net	29,3	20,7	37,9	10,3
Inventory	3,4	4,3	2,6	6,6
Accounts receivable	22,9	25,1	22,7	53,0
Prepaid expenses and other current assets	15,5	20,2	46,3	111,8
Total Operational Assets	**0,9**	**0,4**	**0,2**	**0,1**
Operational Liabilities				
Resale value guarantee				8,5
Other long-term liabilities	14,8	15,0	20,6	48,3
Accounts payable	5,3	4,8	2,3	6,6
Accrued liabilities	6,6	7,7	11,5	27,2
Deferred development compensation	1496,7			
Customer deposits and reservation payments	4,1	3,3	3,6	13,3
Total Operational Liabilities	1,5	1,4	1,2	2,9
Invested Capital	2,1	1,3	1,4	3,8

Tesla Motors - Ratios	**FY 2010**	**FY 2011**	**FY 2012**	**FY 2013**	**Q1 2014**
Liquidity Ratios					
Current Ratio	2,35	2,20	1,23	1,47	2,12
Quick Ratio	1,25	1,43	0,71	0,93	1,70
Cash Burn Rate	8,7	13,8	7,0	175,3	724,7
Finanical gearing	0,07	0,16	0,25	0,09	0,14
Solvency ratio	1,04	1,01	0,94	1,00	1,01
Interest coverage ratio (EBIT)	(200,1)	1 186,3	11 596,6	(1,9)	(3,7)

BMW: Indexing and Day´s Turnover of Invested Capital

BMW, Indexing of Invested Capital	FY 2010	FY 2011	FY 2012	FY 2013
Operational Assets				
Intangible assets	100,0	94,6	92,2	101,7
Property, plant and equipment	100,0	101,2	109,4	124,4
Leased products	100,0	90,2	75,6	39,8
Incestments	100,0	155,1	262,4	384,8
Deferred tax	100,0	122,4	132,1	130,6
Other assets	100,0	122,3	152,6	145,2
Inventories	100,0	122,0	135,7	135,4
Trade receivables	100,0	139,2	148,1	125,0
Current tax	100,0	114,9	99,1	95,7
Other assets	100,0	100,0	86,3	83,3
Total Operational Assets	**100,0**	**110,5**	**119,6**	**125,0**
Operational Liabilities				
Other provisions	100,0	111,7	128,0	133,1
Deferred tax	100,0	76,6	40,5	45,7
Other liabilities	100,0	98,2	106,5	111,2
Other provisions	100,0	118,6	125,1	137,8
Current tax	100,0	132,1	146,6	136,6
Trade payables	100,0	134,5	165,7	198,3
Other liabilities	100,0	119,9	121,6	125,2
Total Operational Liabilities	**100,0**	**116,1**	**121,4**	**128,8**
Invested Capital	**100,0**	**93,4**	**101,5**	**99,1**

BMW, Days Turnover of Invested Capital	FY 2010	FY 2011	FY 2012	FY 2013
PP&E	75,5	65,4	63,7	72,0
Intangible assets	34,1	27,6	24,3	26,6
Investments	29,2	30,5	32,7	32,1
Inventory	46,4	48,4	48,5	48,1
Accounts receivable	12,1	14,4	13,8	11,6
Operating liabilities	(190,4)	(189,2)	(178,2)	(188,0)
Invested capital	**116,8**	**93,4**	**91,4**	**88,7**

Audi: Indexing and Day´s Turnover of Invested Capital

Audi, Indexing of Invested Capital	FY 2010	FY 2011	FY 2012	FY 2013
Operational Assets				
Intangible assets	100,0	108,0	145,1	192,7
Property, plant and equipment	100,0	107,9	123,5	138,1
Leasing and rental assets			140,0	40,0
Investments accounted for using equity method	100,0	146,1	761,7	1 359,9
Deferred tax assets	100,0	140,6	156,8	151,5
Other receivables	100,0	69,9	41,0	30,1
Inventories	100,0	130,5	147,0	149,0
Trade receivables	100,0	116,6	120,1	123,9
Effective income tax assets	100,0	66,7	150,0	216,7
Other receivables	100,0	87,8	93,3	119,8
Total Operational Assets	**100,0**	**116,9**	**145,2**	**169,8**
Operational Liabilities				
Deferred tax liabilities	100,0	56,7	334,3	1 082,1
Other liabilities	100,0	119,6	147,1	187,0
Effective income tax obligations, non-current	100,0	98,7	118,3	134,3
Other provisions	100,0	118,6	124,7	125,1
Trade payables	100,0	116,3	127,8	142,4
Other liabilities	100,0	90,0	64,2	72,6
Other provisions	100,0	107,3	116,6	126,9
Total Operational Liabilities	**100,0**	**109,2**	**109,2**	**117,7**
Invested Capital	**100,0**	**123,0**	**170,3**	**223,2**

Audi, Days Turnover of Invested Capital	FY 2010	FY 2011	FY 2012	FY 2013
PP&E	59,7	51,8	53,6	58,6
Intangible assets	23,3	20,2	24,6	31,9
Investments	14,9	16,7	28,8	39,4
Inventory	30,5	32,0	32,6	32,3
Accounts receivable	27,0	24,2	22,5	23,4
Operating liabilities	(147,9)	(129,8)	(117,4)	(123,7)
Invested capital	**96,1**	**94,9**	**118,5**	**151,8**

Toyota: Indexing and Day´s Turnover of Invested Capital

Toyota Motors, Indexing of Invested Capital	FY 2010	FY 2011	FY 2012	FY 2013
Operational Assets				
Investments and other assets	100,0	117,9	136,8	155,4
Property, plant and equipment	100,0	91,5	86,8	88,1
Trade accounts and notes receivable	100,0	102,4	106,1	122,7
Inventories	100,0	94,6	101,5	115,8
Prepaid expenses and other current assets	100,0	95,5	85,6	92,0
Total Operational Assets	100,0	101,6	105,6	115,9
Operational Liabilities				
Other long-term liabilities	100,0	110,5	103,5	143,1
Accounts payable	100,0	106,1	114,7	133,0
Accrued expenses	100,0	107,6	111,2	125,1
Income taxes payable	100,0	130,2	121,2	140,7
Other current liabilities	100,0	104,3	117,3	125,9
Total Operational Liabilities	100,0	107,2	113,0	130,3
Invested Capital	100,0	98,8	102,1	108,8

Toyota Motors, Indexing of Invested Capital	FY 2010	FY 2011	FY 2012	FY 2013
PP&E	108,1	98,3	94,9	80,6
Investments	90,6	106,2	125,4	119,2
Inventory	29,7	27,9	30,5	29,1
Accounts receivable	34,1	34,7	36,6	35,4
Operating liabilities	(97,0)	(103,5)	(110,8)	(107,1)
Invested capital	**199,7**	**196,3**	**206,1**	**184,0**

Ford: Indexing and Day´s Turnover of Invested Capital

Ford Motors, Indexing of Invested Capital	FY 2010	FY 2011	FY 2012	FY 2013
Invested Capital				
Operational Assets				
Equity in net assets of affiliated companies	100,0	111,8	126,1	142,1
Net property	100,0	99,5	103,4	115,0
Deferred income taxes	100,0	201,8	335,3	327,4
Net intangible assets	100,0	75,7	37,5	0,0
Other assets	100,0	96,4	96,8	131,3
Non-current receivables from Financial Services	100,0	117,7	17,7	400,0
Receivables, less allowance	100,0	111,4	130,0	149,3
Inventories	100,0	107,8	121,0	137,5
Deferred income taxes	100,0	256,6	630,0	604,1
Net investment in operating leases	100,0	75,6	79,4	80,2
Other current assets	100,0	128,1	167,7	166,3
Current receivables from Financial Services	100,0	60,4	20,6	0,0
Total Operational Assets	**100,0**	**110,2**	**130,0**	**140,3**
Operational Liabilities				
Deferred income taxes	100,0	66,2	85,0	104,3
Payables	100,0	109,6	128,3	144,3
Other payables	100,0	142,5	91,1	0,0
Deferred income taxes	100,0	12,4	3,5	10,0
Current payables to Financial Services	100,0	83,6	34,9	31,4
Total Operational Liabilities	**100,0**	**99,2**	**102,6**	**106,9**
Invested Capital	**100,0**	**117,5**	**148,2**	**162,5**

Ford, Days Turnover of Invested Capital	FY 2010	FY 2011	FY 2012	FY 2013
PP&E	69,6	64,4	67,8	68,5
Intangible assets	0,4	0,3	0,1	
Investments	25,5	36,2	53,0	50,9
Inventory	16,8	16,8	19,1	19,7
Accounts receivable	17,8	15,4	15,1	14,4
Operating liabilities	(55,3)	(51,1)	(53,5)	(50,6)
Invested capital	**83,4**	**91,2**	**116,5**	**116,0**

GM: Indexing and Day´s Turnover of Invested Capital

General Motors, Indexing of Invested Capital	FY 2010	FY 2011	FY 2012	FY 2013
Operational Assets				
Equity in net assets on nonconsolidated affiliates	100,0	93,0	83,0	91,0
Property, net	100,0	111,4	124,5	132,0
Intangible assets, net	100,0	82,8	63,7	47,2
Other assets	100,0	96,5	80,8	79,7
Deferred income taxes	100,0	94,0	3 260,8	5 809,4
Accounts and notes receivable	100,0	115,1	125,5	116,7
Inventories	100,0	119,0	130,6	129,3
Equipment on operating leases, net	100,0	95,0	80,2	78,9
Other current assets and deferred income taxes	100,0	83,0	75,5	89,3
Deferred income taxes		100,0	1 889,2	3 752,9
Total Operational Assets	**100,0**	**103,5**	**131,3**	**154,0**
Operational Liabilities				
Other liabilities an deferred income taxes	100,0	96,8	97,4	100,8
Accounts payable	100,0	114,5	123,6	121,3
Accrued liabilities	100,0	101,3	99,7	103,5
Total Operational Liabilities	**100,0**	**104,9**	**107,7**	**109,2**
Invested Capital	100,0	97,0	104,1	105,7

GM, Days Turnover of Invested Capital	FY 2010	FY 2011	FY 2012	FY 2013
PP&E	50,6	50,7	56,7	59,4
Intangible assets	116,9	97,7	57,5	19,0
Investments	31,0	26,2	56,3	83,4
Inventory	29,7	31,7	34,9	34,1
Accounts receivable	21,6	22,4	24,5	22,4
Operating liabilities	(150,6)	(142,1)	(146,0)	(146,2)
Invested capital	**111,1**	**96,9**	**104,2**	**104,4**

Forecast

Appendix 6.1 – Forecast of Sales

The inputs and estimates used to forecast sales from 2014 to 2020 is presented in the tables below.

Automotive Sales	FY 2013	EY 2014	EY 2015	EY 2016	EY 2017	EY 2018	EY 2019	EY 2020
Production Volume	**31 000**	**50 000**	**73 390**	**107 722**	**158 114**	**232 079**	**340 646**	**500 000**
Delivery lag	0,7	0,7	0,8	0,8	0,9	0,9	0,8	0,8
Vehicles delivered								
Model S, Units	22 477	35 000	50 000	55 000	58 300	57 134	55 420	53 757
Growth		*55,7 %*	*43 %*	*10 %*	*6 %*	*-2 %*	*-3 %*	*-3 %*
Model X, Units			10 000	30 000	39 000	42 900	45 045	47 297
Growth				*200 %*	*30 %*	*10 %*	*5 %*	*5 %*
Gen 3, Units					50 000	100 000	180 000	297 000
Growth						*100 %*	*80 %*	*65 %*
Total	**22 477**	**35 000**	**60 000**	**85 000**	**147 300**	**200 034**	**280 465**	**398 055**
Avg. price per unit 1,000								
Model S	78	92	90	88	86	84	83	81
Model X			92	90	88	86	84	83
Gen 3					45	44	43	42
Revenue, 1,000								
Model S		**3 203 077**	**4 484 308**	**4 834 084**	**5 021 647**	**4 822 789**	**4 584 544**	**4 358 067**
Model X			915 165	2 690 585	3 427 805	3 695 174	3 802 334	3 912 602
Gen 3					2 250 000	4 410 000	7 779 240	12 579 031
Total Revenues	**1 758 184**	**3 203 077**	**5 399 473**	**7 524 669**	**10 699 452**	**12 927 963**	**16 166 118**	**20 849 700**

- I have applied a 46.6% CAGR to forecast production growth, based on management´s guidance and the findings in the strategic and financial analysis.
- Sales growth and prices have been forecasted for each vehicle model, where prices decline at a rate of 2% annually.

Appendix 6.2 - Implied Market Share

The table below shows my expectations for the size of the total automotive market in 2020 by number og vehicles sold. It have also illustrated the expected share of the premium segment and Tesla´s share of the premium segment and total market. I expect Tesla to take 3.7% og the premium market in 2020 and 0.4% of the total automotive market in 2020.

Year	Total Vehicle Sales	Premium segment growth	Premium segment sales	Tesla sales	Share of premium market	Share of total market
FY 1999	44 003 697					
FY 2000	45 383 002					
FY 2001	47 314 990					
FY 2002	48 729 394					
FY 2003	50 904 331					
FY 2004	52 963 670					
FY 2005	54 992 161					
FY 2006	57 225 642					
FY 2007	60 801 848					
FY 2008	57 196 717					
FY 2009	57 781 575					
FY 2010	65 909 343					
FY 2011	68 324 165					
FY 2012	72 643 162					
FY 2013	76 280 279	9,8 %	7 475 467	22 477	0,3 %	0,0 %
EY 2014	79 331 490	10,1 %	8 012 481	35 000	0,4 %	0,0 %
EY 2015	82 504 750	10,3 %	8 497 989	60 000	0,7 %	0,1 %
EY 2016	85 804 940	10,5 %	9 009 519	85 000	0,9 %	0,1 %
EY 2017	89 237 137	10,8 %	9 637 611	147 300	1,5 %	0,2 %
EY 2018	92 806 623	10,7 %	9 930 309	200 034	2,0 %	0,2 %
EY 2019	96 518 888	10,7 %	10 327 521	280 465	2,7 %	0,3 %
EY 2020	100 379 643	10,7 %	10 740 622	398 055	3,7 %	0,4 %

Expected CAGR 2013-2020	4 %

Appendix 6.3 - Cost Forecast

Key cost drivers	FY 2013	EY 2014	EY 2015	EY 2016	EY 2017	EY 2018	EY 2019	EY 2020
Fixed COGS (2%)	(35 164)	(64 062)	(107 989)	(150 493)	(213 989)	(258 559)	(323 322)	(416 994)
Variable COGS								
Warranty Provision	(61 401)	(91 000)	(156 000)	(221 000)	(382 980)	(500 085)	(701 162)	(995 137)
Per vehicle	2,7	2,6	2,6	2,6	2,6	2,5	2,5	2,5
Freight and other	(104 983)	(26 250)	(45 000)	(63 750)	(110 475)	(150 026)	(210 349)	(298 541)
Per vehicle		(0,8)	(0,8)	(0,8)	(0,8)	(0,8)	(0,8)	(0,8)
Material costs ex. battery	(790 895)	(1 258 159)	(2 142 105)	(3 015 075)	(4 330 058)	(5 284 253)	(6 673 914)	(8 693 528)
% of vehicle sales	-39,3 %	-39,3 %	-39,7 %	-40,1 %	-40,5 %	-40,9 %	-41,3 %	-41,7 %
Battery Pack	(551 436)	(816 011)	(1 329 383)	(1 789 736)	(2 651 637)	(3 241 583)	(4 106 603)	(5 327 957)
Per vehicle								
Model S	(24,5)	(23,3)	(22,2)	(21,1)	(20,0)	(19,0)	(18,1)	(17,2)
Model X			(22,2)	(21,1)	(20,0)	(19,0)	(18,1)	(17,2)
Gen 3					(14,1)	(13,4)	(12,7)	(12,1)
Per kWh	320,0	304,1	289,0	274,6	261,0	248,0	235,7	224,0
Total variable COGS	(1 508 714)	(2 191 419)	(3 672 488)	(5 089 561)	(7 475 149)	(9 175 947)	(11 692 029)	(15 315 163)
Total vehicle COGS	**(1 543 878)**	**(2 255 481)**	**(3 780 478)**	**(5 240 055)**	**(7 689 138)**	**(9 434 506)**	**(12 015 351)**	**(15 732 157)**
Per vehicle	(68,7)	(64,4)	(63,0)	(61,6)	(52,2)	(47,2)	(42,8)	(39,5)
Gross profit ex. D&A	**27 %**	**30 %**	**30 %**	**30 %**	**28 %**	**27 %**	**26 %**	**25 %**

- The components of variable costs are estimated based on observed levels among peers and historical numbers.
- In order to isolate the the impact of battery costs, all variable costs are measured on a per vehicle basis.
- Material costs excluding batteries are estimated to ~40% in the first year based on the 2013 level. Hereinafter, material costs rises 1% assuming rising raw material costs. An increase above this level is expected to be offset by the relative bargaining power over suppliers.
- A negative CAGR of 4.97% has been applied to estimate the year-over-year decrease in battery costs. The choice of growth rate stems from the assumption that battery prices are currently USD 320 per kWh and that the estimated cost wil decline by 30% in 2020.
- Total battery cost is estimated for each vehicle model, and assumes a equal distribution between the the 60 kWh and 85 kWh battery pack for Model S/X and the 48 kWh and 60 kWh battery pack for Gen 3.

Appendix 6.4 Historical development of value drivers

The historical development of value drivers is summarized in the table below.

Drivers	EY '10	EY '11	EY '12	EY '13	Avg. Hist.
Revenue Growth	4 %	75 %	102 %	387 %	142,2%
Gross-margin	35 %	38 %	14 %	28 %	26,2%
SG&A as a percentage of revenue	72 %	51 %	36 %	14 %	42,3%
R&D as a percentage of revenue	80 %	102 %	66 %	12 %	55,4%
Net borrowing rate	-0,9%	0,4%	0,0%	23,3%	-0,2%
Effective tax rate	-0,1%	-0,2%	0,0%	-3,6%	-1,0%
Depreciation as a percentage of PP&E	9,3%	5,7%	5,2%	14,4%	8,6%
CAPEX as a percentage of Revenue	*-154 %*	*-79 %*	*-50 %*	*-12 %*	
PP&E as a percentage of Revenue	98 %	146 %	134 %	37 %	103,7%
Inventories as a percentage of Revenue	38,7%	24,5%	65,0%	16,9%	36,3%
Notes and accounts receivable as a percentage of Revenue	5,7%	4,7%	6,5%	2,4%	4,8%
Operational liabilities as a percentage of Revenue	79,6%	95,4%	122,7%	43,2%	85,2%
NIBD as a percentage of Invested Capital	-79,8%	-8,4%	67,3%	3,6%	-4,4%

Appendix 6.5 Expected Profit Margin Drivers

The table below show the factors that are expected to affect the development of EBITDA from 2014 – 2020.

EBITDA Vehicle business	EY 2014	EY 2015	EY 2016	EY 2017	EY 2018	EY 2019	EY 2020
Raw material prices	↓	↓	↓	↓	↓	↓	↓
Decreasing battey cell costs	↑	↑	↑	↑	↑	↑	↑
Integrated distribution model and Superchargers	↓	↓	↓	↑	↑	↑	↑
Low marketing expenses	↑	↑	↑	↑	↑	↑	↑
Development of Gen 3		↓	↓	↓	↑	↑	↑
Production ramp-up of Model S/Model X	↓	↓	↓	↓	↓	↓	↓
Δ EBITDA	↑	↑	↑	↓	↑	↑	↑

- Raw material prices will increase the cost of materials in all years.
- The decrease in battery cell costs will increase margins in all years.
- The integrated distrubution model and Superchargers will reduce margins in the first years due to high expenses and capital investmnets, but will be profitable over time as Tesla can take the margin that other manufacturers pay to franchise dealerships.
- Low marketing expenses will reduce SG&A expenses
- The development og Gen 3 will require investment in the first years, but will increase margins as sales offset fixed costs.

Appendix 6.6 Forecasting: Pro forma Income Statement and Balance Sheet

USD 1,000

Tesla Motors - Income Statement	EY 2014	EY 2015	EY 2016	EY 2017	EY 2018	EY 2019	EY 2020
Total revenues	**3 203 077**	**5 399 473**	**7 524 669**	**10 699 452**	**12 927 963**	**16 166 118**	**20 849 700**
Gross profit, adjusted	947 596	1 618 996	2 284 615	3 010 313	3 493 457	4 150 767	5 117 543
Research and development	(480 462)	(674 934)	(902 960)	(1 069 945)	(1 163 517)	(1 131 628)	(1 250 982)
Selling, general and administrative	(416 400)	(593 942)	(677 220)	(855 956)	(904 957)	(808 306)	(833 988)
EBITDA	**50 735**	**350 119**	**704 434**	**1 084 412**	**1 424 983**	**2 210 833**	**3 032 573**
Depreciation	(132 223)	(232 177)	(323 561)	(460 076)	(544 784)	(653 434)	(824 814)
EBIT	**(81 488)**	**117 942**	**380 873**	**624 336**	**880 199**	**1 557 398**	**2 207 759**
Net financial expenses	(2 475)	(3 545)	(34 224)	(71 541)	(144 245)	(190 222)	(255 841)
EBT	**(83 964)**	**114 397**	**346 650**	**552 795**	**735 953**	**1 367 176**	**1 951 918**
Effective tax rate	25 %	25 %	25 %	25 %	25 %	25 %	25 %
Tax on EBIT	20 372	(29 486)	(95 218)	(156 084)	(220 050)	(389 350)	(551 940)
NOPAT	**(61 116)**	**88 457**	**285 655**	**468 252**	**660 149**	**1 168 049**	**1 655 819**
Net financial expenses	(2 475)	(3 545)	(34 224)	(71 541)	(144 245)	(190 222)	(255 841)
Tax shield	619	886	8 556	17 885	36 061	47 556	63 960
Net income	**(62 973)**	**85 798**	**259 987**	**414 596**	**551 965**	**1 025 382**	**1 463 939**

USD 1,000

Tesla Motors - Income Statement	EY 2021	EY 2022	EY 2023	EY 2024
Total revenues	**23 977 155**	**26 374 871**	**27 693 614**	**28 801 359**
Gross profit, adjusted	5 885 175	6 473 692	6 797 377	7 069 272
Research and development	(1 438 629)	(1 582 492)	(1 661 617)	(1 728 082)
Selling, general and administrative	(959 086)	(1 054 995)	(1 107 745)	(1 152 054)
EBITDA	**3 487 459**	**3 836 205**	**4 028 015**	**4 189 136**
Depreciation	(948 536)	(1 043 390)	(1 095 559)	(1 139 382)
EBIT	**2 538 923**	**2 792 815**	**2 932 456**	**3 049 754**
Net financial expenses	(319 809)	(367 781)	(404 559)	(424 786)
EBT	**2 219 114**	**2 425 035**	**2 527 897**	**2 624 968**
Effective tax rate	25 %	25 %	25 %	25 %
Tax on EBIT	(634 731)	(698 204)	(733 114)	(762 439)
NOPAT	**1 904 192**	**2 094 611**	**2 199 342**	**2 287 316**
Net financial expenses	(319 809)	(367 781)	(404 559)	(424 786)
Tax shield	79 952	91 945	101 140	106 197
Net income	**1 664 335**	**1 818 776**	**1 895 923**	**1 968 726**

Tesla Motors - Balance Sheet	EY 2014	EY 2015	EY 2016	EY 2017	EY 2018	EY 2019	EY 2020
Assets							
Property, plant and equipment	1 537 477	2 699 737	3 762 335	5 349 726	6 334 702	7 598 075	9 590 862
Inventory	544 523	917 910	1 279 194	1 818 907	2 197 754	2 748 240	3 544 449
Accounts receivable	144 138	242 976	338 610	481 475	581 758	727 475	938 237
Total Assets	2 226 139	3 860 623	5 380 138	7 650 108	9 114 214	11 073 791	14 073 548
Total Operational Liabilities	1 345 292	2 159 789	3 009 868	4 065 792	4 912 626	5 819 802	7 505 892
NWC	(656 631)	(998 903)	(1 392 064)	(1 765 410)	(2 133 114)	(2 344 087)	(3 023 207)
∆ NWC	(164 566)	(342 272)	(393 161)	(373 346)	(367 704)	(210 973)	(679 119)
Invested Capital	**880 846**	**1 700 834**	**2 370 271**	**3 584 316**	**4 201 588**	**5 253 988**	**6 567 656**
Net Interest Bearing Debt	35 234	340 167	711 081	1 433 727	1 890 715	2 542 930	3 178 745
Total Equity	845 612	1 360 667	1 659 190	2 150 590	2 310 873	2 711 058	3 388 910
Invested Capital (NIBD + E)	**880 846**	**1 700 834**	**2 370 271**	**3 584 316**	**4 201 588**	**5 253 988**	**6 567 656**

Tesla Motors - Balance Sheet	EY 2021	EY 2022	EY 2023	EY 2024
Assets				
Property, plant and equipment	11 029 491	12 132 440	12 739 062	13 248 625
Inventory	4 076 116	4 483 728	4 707 914	4 896 231
Accounts receivable	1 078 972	1 186 869	1 246 213	1 296 061
Total Assets	16 184 580	17 803 038	18 693 189	19 440 917
Total Operational Liabilities	8 631 776	9 494 953	9 969 701	10 368 489
NWC	(3 476 687)	(3 824 356)	(4 015 574)	(4 176 197)
∆ NWC	(453 481)	(347 669)	(191 218)	(160 623)
Invested Capital	**7 552 804**	**8 308 084**	**8 723 488**	**9 072 428**
Net Interest Bearing Debt	3 655 557	4 021 113	4 222 168	4 391 055
Total Equity	3 897 247	4 286 971	4 501 320	4 681 373
Invested Capital (NIBD + E)	**7 552 804**	**8 308 084**	**8 723 488**	**9 072 428**

Weighted Average Cost of Capital

Appendix 7.1 Beta Estimation

Implied credit rating based on Standard & Poor´s approach

	2009	2010	2011	2012	2013
EBIT interest coverage	CCC	CCC	AAA	AAA	CCC
EBITDA interest coverage	CCC	CCC	AAA	AAA	B
ROIC		CCC	CCC	CCC	CCC
Operating Income/Sales	CCC	CCC	CCC	CCC	CCC
Long-term debt/Capital	AAA	BBB	CCC	CCC	CCC
Total debt/Capital	AAA	AAA	AAA	AA	AAA
Operating Cash Flow/Capital	CCC	CCC	CCC	CCC	AA
Implied credit rating	CCC	CCC	BBB	BBB	B-

Source: Petersen & Plenborg (2012)/S&P/Compiled by author

Fundamental Beta estimation and Regression beta

Risk type	Assessment	Ability to manage risk
Operational risk		
External		**Reasonable --> Insufficient**
Battery price	High	Risk of battery prices remaining high
Economic cyclicality	Medium	Low risk in the short-term/high risk in the long-term
Regulatory	Medium	Will never be unfavourable, but incentives such as EV credits will go to zero
Raw materials	High	Major part of battery cost is raw meterials. Highly affected by volatility in material prices and dependece on scarce resources such as lithium
Interest rates	Low	Low
Oil prices	Medium	Cost benefit analysis of EV vs. traditional vehicles may be unfavourble if oil prices fall significantly
Strategic		**Reasonable**
Rivalry among competitors	High	Competitors have more resources and the industry competition is intense
Supplier power	Medium	Tesla relies on a single supplier of battery cells.
Customer power	Low	Demand is higher than supply
Substitutes	Low	No avaiable direct sustitures
Threat of entry	Low	Entry barriers are high due to the capital intesity of the industry
Market growth	Medium	Growing market, but limited production capcity limit ability to gain market share
Operating		**Not sufficient**
Utilization of production facilities	High	Need to scale up to produce 500,000 vehicles annually.
R&D and innovation	Low	Proprietary technology and high quality vehicles
Quality of management	Low	Highly qualified management, se appedix 1.1 - management team
Cost structure	High	High level of fixed costs
Execution	High	Novel technology and limited product portfolio. Product failures will significantly hurt sales and stock price.
Quality of product porfolio	Medium	High quality but undiversified
Total operational risk:	**High**	
Financial risk		
Short-term liquidity risk	Low	Current and quick ratio is sufficient and cash burn rate has improved
Long-term liquidity risk	High	Unable to cover interest expenses
Total financial risk	**Neutral**	

Appendix 8.1 Valuation

Discounted Cash Flow Valuation

		Explicit Forecast						
DCF Valuation	**FY 2013**	**FY 2014**	**FY 2015**	**FY 2016**	**FY 2017**	**FY 2018**	**FY 2019**	**FY 2020**
USD 1,000								
31.03.14								
WACC		8,1%	8,1%	8,1%	8,1%	8,1%	8,1%	8,1%
Discounted Cash Flow								
FCFF		(250 238)	(731 531)	(383 782)	(745 794)	42 877	115 648	342 152
Growth in terminal period								
Discount factor		0,92	0,86	0,79	0,73	0,68	0,63	0,58
PV of FCFF		(231 454)	(625 826)	(303 680)	(545 834)	29 025	72 411	198 149
PV of FCFF explicit foecast	(1 407 209)							
PV of FCFF, fade period	1 973 347							
PV of FCFF, terminal	21 581 413							
Enterprise value 1/1-14	22 147 550							
Enterprise Value 31/3-14	**22 583 855**							
NIBD	(136 802)							
Equity Value	**22 720 657**							
Shares outstanding, 1000	123 473							
Share price, USD	**184,01**							

		Fade period			Terminal
DCF Valuation	**FY 2013**	**FY 2021**	**FY 2022**	**FY 2023**	**FY 2024**
USD 1,000					
31.03.14					
WACC		8,1%	8,1%	8,1%	8,1%
Discounted Cash Flow					
FCFF		919 044	1 339 331	1 783 938	1 938 376
Growth in terminal period					4 %
Discount factor		0,54	0,50	0,46	11,13
PV of FCFF		492 289	663 563	817 494	21 581 413
PV of FCFF explicit foecast	(1 407 209)				
PV of FCFF, fade period	1 973 347				
PV of FCFF, terminal	21 581 413				
Enterprise value 1/1-14	22 147 550				
Enterprise Value 31/3-14	**22 583 855**				
NIBD	(136 802)				
Equity Value	**22 720 657**				
Shares outstanding, 1000	123 473				
Share price, USD	**184,01**				

Economic Value Added Valuation

EVA Valuation	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
					Explicit Forecast			
Invested Capital	691 724	880 846	1 700 834	2 370 271	3 584 316	4 201 588	5 253 988	6 567 656
NOPAT	(63 503)	(61 116)	88 457	285 655	468 252	660 149	1 168 049	1 655 819
EVA		(117 256)	16 968	147 617	275 883	369 250	827 053	1 229 412
Growth in terminal period								
Discount factor		0,92	0,86	0,79	0,73	0,68	0,63	0,58
PV of EVA		(108 454)	14 516	116 807	201 914	249 961	517 841	711 985
PV of EVA, explicit forecast	1 704 571							
PV of EVA, fade period	2 167 404							
PV of EVA, terminal	17 583 851							
Invested Capital, t 0	691 724							
Enterprise value1/1-14	22 147 550							
Enterprise Value 31/3-14	**22 583 855**							
NIBD	(136 802)							
Equity Value	**22 720 657**							
Shares outstanding, 1000	123 473							
Share price, USD	**184,01**							

EVA Valuation	FY 2013	FY 2021	FY 2022	FY 2023	FY 2024
			Fade period		Terminal
Invested Capital	691 724	7 552 804	8 308 084	8 723 488	9 072 428
NOPAT	(63 503)	1 904 192	2 094 611	2 199 342	2 287 316
EVA		1 371 169	1 481 635	1 525 068	1 579 327
Growth in terminal period					4,0 %
Discount factor		0,54	0,50	0,46	11,13
PV of EVA		734 471	734 067	698 866	17 583 851
PV of EVA, explicit forecast	1 704 571				
PV of EVA, fade period	2 167 404				
PV of EVA, terminal	17 583 851				
Invested Capital, t 0	691 724				
Enterprise value1/1-14	22 147 550				
Enterprise Value 31/3-14	**22 583 855**				
NIBD	(136 802)				
Equity Value	**22 720 657**				
Shares outstanding, 1000	123 473				
Share price, USD	**184,01**				

Cash Flow Statement

Tesla Motors - Cash Flow Statement	EY 2014	EY 2015	EY 2016	EY 2017	EY 2018	EY 2019	EY 2020
NOPAT	(61 116)	88 457	285 655	468 252	660 149	1 168 049	1 655 819
Depreciation	63 510	132 223	232 177	323 561	460 076	544 784	653 434
Accounts receivable	(95 029)	(98 838)	(95 634)	(142 865)	(100 283)	(145 717)	(210 761)
Inventories	(204 168)	(373 387)	(361 283)	(539 713)	(378 847)	(550 486)	(796 209)
Operating liabilities	475 422	814 497	850 078	1 055 924	846 834	907 176	1 686 090
CF from operations	612 255	562 951	910 994	1 165 158	1 487 930	1 923 806	2 988 373
CF from investments	(862 494)	(1 294 483)	(1 294 775)	(1 910 952)	(1 445 053)	(1 808 158)	(2 646 221)
FCFF	**(250 238)**	**(731 531)**	**(383 782)**	**(745 794)**	**42 877**	**115 648**	**342 152**
Changes in NIBD	10 630	304 933	370 914	722 645	456 988	652 216	635 815
Net financial expenses	(2 475)	(3 545)	(34 224)	(71 541)	(144 245)	(190 222)	(255 841)
Tax shield	619	886	8 556	17 885	36 061	47 556	63 960
Cash flow from financing activities	**8 773**	**302 274**	**345 247**	**668 990**	**348 804**	**509 549**	**443 934**
FCFE	**(241 465)**	**(429 257)**	**(38 535)**	**(76 804)**	**391 681**	**625 197**	**786 087**
Dividends	241 465	429 257	38 535	76 804	(391 681)	(625 197)	(786 087)
Free reserves	**0,0**	**0,0**	**0,0**	**0,0**	**0,0**	**0,0**	**0,0**

USD 1,000

Tesla Motors - Cash Flow Statement	EY 2021	EY 2022	EY 2023	EY 2024
NOPAT	1 904 192	2 094 611	2 199 342	2 287 316
Depreciation and amortization	824 814	948 536	1 043 390	1 095 559
Accounts receivable	(140 735)	(107 897)	(59 343)	(49 849)
Inventories and operating lease vehicles	(531 667)	(407 612)	(224 186)	(188 317)
Operating liabilities	1 125 884	863 178	474 748	398 788
Cash flow from operating activities	3 182 487	3 390 816	3 433 950	3 543 498
Cash flow from investment activities	(2 263 443)	(2 051 485)	(1 650 012)	(1 605 122)
FCFF	**919 044**	**1 339 331**	**1 783 938**	**1 938 376**
Changes in NIBD	476 812	365 556	201 056	168 887
Net financial expenses	(319 809)	(367 781)	(404 559)	(424 786)
Tax shield	79 952	91 945	101 140	106 197
Cash flow from financing activities	**236 955**	**89 720**	**(102 363)**	**(149 703)**
Free cash flows to equity (FCFE)	**1 155 999**	**1 429 051**	**1 681 575**	**1 788 673**
Dividends	(1 155 999)	(1 429 051)	(1 681 575)	(1 788 673)
Free reserves	**0,0**	**0,0**	**0,0**	**0,0**

Appendix 8.2 Bloomberg consensus comparison of multiples

	2014			2015		
	EV/EBITDA	EV/EBIT	EV/Sales	EV/EBITDA	EV/EBIT	EV/Sales
Bloomberg	80.4X	194.6X	7.4x	40.6X	70.0X	5.2x
My estimate	445.1x	N/A	7.1x	64.5x	191.5x	3.2x